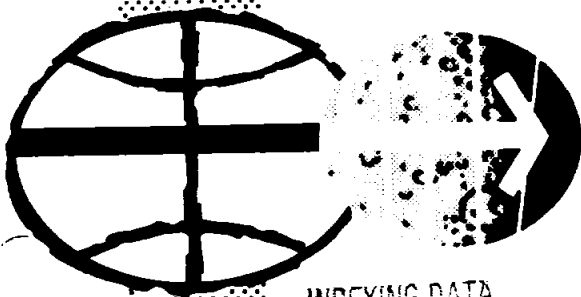




NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Apollo 15 Spacecraft Commentary

July 26 - August 7, 1971



MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDEXING DATA

DATE	OFF	#	T	PCM	SUBJECT	SIGNATOR	LOC
11-10-71	100		R	100	(Orif)		179-10

PAO This is Kennedy Launch Control T-1 hour 31 minutes and counting. All still going well with Apollo 15. The astronaut crew onboard the spacecraft at the 320 foot level still working on their final checks, working with spacecraft conductor, test conductor Skip Chauvin. Chauvin just a short while ago instructed to the pad leader to start breaking up the flight room. This is one of the final processes before the crew is moved, the close out crew departs from the spacecraft area. The close out process at this point is to remove certain panels so that the swing arm will be able to come back without any problems at the 43 minute mark on the count. This is swing arm 9, the Apollo access arm, which is first moved some 6 feet away from the spacecraft. Here in the control center we're getting into some checks of the tracking beacons on the Saturn 5 launch vehicle, and the checks both here and in the firing room as far as launch vehicle and in the spacecraft control room still going very well. 1 hour 29 minutes and counting this is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control T-minus 1 hour 21 minutes and counting. All aspects of the count-down still GO for Apollo 15. Still aiming toward our planned T-0 liftoff at 9:34 A.M. EDT. The Administrator of the National Aeronautics and Space Administration, Dr. James Fletcher, has just arrived here in firing room 1, the control room for this launch. He's being briefed by the Deputy Administrator, Dr. George Low, and is being told that the countdown is still going excellently as it has since it picked up late last evening. The spacecraft commander, Dave Scott, aboard the spacecraft, with his 2 comrades at the 320 foot level of the PAD, Scott now working on some command and guidance checks, working with spacecraft test conductor Skip Chauvin in the spacecraft checkout team. Here in the firing room, under the direction of test supervisor Jim Harrington, and the launch vehicle test conductor Norman Carlson, the launch team making some final telemetry checks of the status - of the tracking telemetry in the 3 stages in the instrument unit of the saturn 5 launch vehicle. Still counting, still GO. Weather report excellent for launch attempt, a beautiful morning for a flight to the moon. 1 hour 19 minutes 45 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7-26-71, 07:26 (cst), MC-3/1

PAO This is Kennedy Launch Control, T minus 71 minutes and counting. 71 minutes and counting all still proceeding very satisfactorily with the countdown for Apollo 15. Spacecraft Commander Dave Scott who sits on the left hand side of the spacecraft still very busy onboard working with spacecraft head conductor Skip Chauvin as they make final checks of the guidance and stabilization control systems aboard the Apollo spacecraft. As a part of this test Dave Scott actually will send commands to cause that big engine below them in the service module to swing or gimbal in response to commands from the guidance system - the service module propulsion system which is capable of some 20,500 thousand pounds of thrust is used for all the major maneuvers on the flight to and from the moon. Once the big Saturn 5 launch vehicle has done it's job then placed it on its proper trajectory toward the moon. Here in firing room 1 our checks of various telemetry systems and calibration of telemetry the tracking information will repeat from the vehicle is still continuing. We will also be coming up shortly on some more checks of the tracking beacons on board. We have been alerted that the swing arm the Apollo access arm at the 320 foot level may come back about 10 minutes earlier in the count because the count has been going so well and we've been a little bit ahead of many of the procedures. The closeout crew who have been aiding the astronauts at the 320 foot level have completed their job and have now departed. That's our status. All is GO. 79 minutes, 20 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/26/71, 7:35 cst, MC4/1

PAO This is Kennedy Launch Control, T-61 minutes and counting. T-61, the countdown still proceeding very satisfactorily. Now just a little more than an hour away from planned liftoff here on the Apollo 15 mission. Astronaut Dave Scott, who will be making his third space flight, is still working with his spacecraft test conductor in the spacecraft cabin of the 320-foot level of the pad, working with spacecraft test conductor Skip Chauvin back at the control room. We have completed our final guidance alinement checks of the spacecraft systems and we're now making some final checks of the entry monitoring system, the system that will help guide the spacecraft back in on a reentry from the trip from the Moon and also, of course, if there is an emergency condition where the spacecraft had to come back in. Skip Chauvin has just advised the astronauts that the swing arm which is now still attached to the spacecraft, probably will be coming back in about 7 minutes from this time. The swing arm has moved to a position about 6 feet away from the spacecraft, so that if there was an emergency condition where the astronauts needed to egress the spacecraft in a hurry, that swing arm could be brought back in in a matter of seconds, so that the astronauts could get out. At the 5-minute mark in the countdown, the swing arm has retracted to its fully retracted position at the pad. Here in the launch control center our telemetry calibration checks are still in progress. We'll be making some checks of the range safety command destrut system aboard the vehicle; this system would be used to destroy the vehicle after an abort sequence had occurred and the astronauts had escaped from the vehicle in trouble. That's our status. All is go 59 minutes 10 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 07:38 CST 5/1

PAO Kennedy Launch Control T minus 56 minutes and counting all still going well with the countdown at this time. Coming up in just about 3 minutes, that Apollo access arm the arm that the astronauts use to go across to board their spacecraft will be retracted to a stand by position. Its retracted 12 degrees or some 6 feet from the spacecraft. Once this does occur we arm that launch escape system, the launch escape tower on top of the spacecraft and from that point down in the countdown, if there was any critical emergency situation an abort could take place right on the launch pad with the solid fuel motors in the launch escape tower which generate some 155 thousands pounds of thrust pulling the spacecraft away from a launch vehicle that would be in trouble in an explosion eminent. This is one of the number of the emergency conditions that we do plan for and do -- have systems to handle during the last hour or so of the countdown. All aspects of the count still going well 54 minutes 45 seconds in counting. This is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control. Swing arm is now moving back from the spacecraft on command, right at the 53 minute mark. It will be moved some 6 feet away from the spacecraft and will remain in that standby condition for contingency purposes through the remainder of the countdown until at 5 minutes, it is fully retracted. The astronauts of course were alerted that this event would occur because they do feel a slight jolt as the swing arm and the white room attached to its ship, is pulled away. The Astronauts can still continuing their final checks aboard the spacecraft, and the crew here in firing room 1, at the launch control center here in complex 39 are still monitoring the status of the propellants onboard the vehicle. We loaded more than 3/4 of a million gallons of liquid oxygen, liquid hydrogen aboard the saturn 5 this morning from the time the countdown picked up late last evening. A power transfer test, one of our key tests, over the last hour or so in the countdown, has been successfully accomplished here in the firing room. We have switched from external power to the internal batteries onboard the 3 stages and instrument unit of the saturn 5 to assure that they are operating properly. To conserve those batteries onboard, we've now returned to external power. We will finally switch internal with the rocket at the 50 second mark in the count. The countdown has been going very well, in fact we're about 10 minutes ahead on events, both concerned with the spacecraft and the launch vehicle. We're now 51 minutes, 25 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control. T minus 46 minutes and counting. T minus 46 minutes and counting. We are proceeding satisfactorily aiming toward our planned lift off here for Apollo 15. The Apollo 15 astronaut crew standing by in the spacecraft at this time. They'll have quite a bit more work before we reach our T 0, but they are standing by at this point. They've completed their guidance and alinement checks and are waiting as certain key launch vehicles checks are taking place at this time. We have just completed a check of the digital lane safety command destruct system. These are the destruct packages aboard the 3 stages of the Saturn 5 that would be activated if the vehicle was flying off course and was a danger to personnel below. Of course before the destruct system would be activated, the aboard sequence would take place and the astronaut crew and their spacecraft would be separated from the launch vehicle. Our weather is go and all aspects of the count down go. 44 minutes 57 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/26/71, 07:52, MC8/1

PAO This is Kennedy Launch Control at T minus 40 minutes, 54 seconds and counting. Still proceeding very well at this time aiming toward our planned G-zero at 9:34 a.m. The astronauts will be busy again shortly in the spacecraft particularly command module pilot Al Worden as he proceeds to go through the sequence of pressurizing the reaction control system of the spacecraft. This is primarily concerned with those four quadrants of hundred pound thrust rockets on the side of the service module. We pressurized that system before launch and Al Worden reads out the status of the overall system so that spacecraft test conductor Skip Chauvin and crew are back in the spacecraft control center can determine that that system is GO for launch. Of course, the reaction control system used extensively on the flight to and from the moon for small refinements on trajectory. Here in firing room one we're go for the final portion of the count. We have a clearance from the range to launch and our countdown is continuing. The countdown has been going excellently since it picked up at 11:34 p.m. last evening following a 9 hour 34 minute built in hold. Since that time a major portion of the count was devoted to the propellant loading of the Saturn V launch vehicle, bringing aboard liquid oxygen and liquid hydrogen or so called cryogenic propellants aboard the three stages of the vehicle. We loaded more than 3/4 of a million gallons of the oxygen and hydrogen onboard and at liftoff we expect to have the vehicle weighing close to 6.5 million pounds on the launch pad. The Saturn V space vehicle stands some 363 feet. As far as the Apollo 15 crew is concerned, the crew was awakened by their boss, Donald K. Slayton, as planned in the countdown at 4:19 a.m. eastern daylight time. They were given a brief physical exam by Dr. Jack Keegan a short time later and he declared them in excellent physical condition and very well rested. The crew then sat down to breakfast with a number of the astronaut members of the backup team and support team who have worked so hard with them in preparation for the mission and then were ready to proceed to the suit laboratory to don their pressure suits and go through final checks prior to being ready to go to the launch pad. Once again as planned in the countdown they departed the crew quarters at 6:28 a.m. eastern daylight time, arrived at the pad about 18 minutes later and then went onboard the spacecraft at about the 2-1/2 hour mark in the count. Since that time Scott, Worden, and Irwin have been performing various checks working with the spacecraft control team and all these checks have gone well. Our status is excellent at this time. The weather forecast certainly a GO for launch with clear skies, clear to scattered skies, the surface winds about 10 miles per hour from the south and

APOLLO 15 MISSION COMMENTARY, 7/26/71, 07:52, MC8/2

PAO the weather situation on the worldwide track
as far as contingency purposes all GO. That's our status
T minus 37 minutes, 35 seconds and counting. This is Kennedy
Launch Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 8:03 CST 9/1

PAO This is Kennedy Launch Control at T-minus 31 minutes and counting. T-minus 31 on mission with Apollo 15, still GO. This is the fourth flight intended for a Lunar Landing and all is going well. We're still aiming toward our planned T-0 at 9:34 A.M. EDT, when if all goes well, those 5 big engines in the first stage of the Saturn 5 will ignite, generating more than 7.7 million pounds of thrust to start us on the way on a long trip to the moon. 30 minutes 25 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control. T minus 26 minutes and counting. We are still proceeding very satisfactorily here in the final minutes of the count down. All still going well. The busy activity right now, astronaut Al Worden giving final verification of the status of the propellant system onboard the Apollo spacecraft. He's working with spacecraft test conductor Skip Chauvin giving the key readings on the various systems, temperatures and pressures to assure that that reaction control system is go for the launch. They will have a lot of work to do during the mission and we wanted to make sure that it is precisely right before we are ready to commit the launch. Skip Chauvin now informs the astronauts that we are still about 10 minutes ahead in the countdown, and Dave Scott replies back with a rather quick Roger. The count down is still going. Launch vehicle status is go 25 minutes 2 seconds and counting, and this is Kennedy Launch Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 08:13 CDT 11/1

PAO This is Kennedy Launch Control T minus 20 minutes 56 seconds and counting all aspects of the count at still go still aiming toward our plan T zero at the appointed time of 9:34 A.M. Astronaut Al Worden -- Worden, the Command Module Pilot in the middle seat has completed his checks of the pressurization system for the reaction controls of the Apollo spacecraft and all is still going well. Here in the Launch Control Center, the crew has started a sequence to chill down the upper two stages of the Saturn V because of the extremely low temperatures of the liquid oxygen and liquid hydrogen involved in the propellant system and it is necessary to condition the engine chambers in both the second and third stages so that they will be at a lower temperature when the propellants are introduced at ignition time during the powered stage of the flight. We'll have more than 11 minutes of powered flight in the first stage of the mission before the spacecraft -- the Apollo spacecraft is placed into a parking orbit some 90 nautical miles high still attached to the third stage. A second burn of that third stage of the Saturn V will place the spacecraft on its proper translunar trajectory. Our status, 19 minutes 40 seconds and counting, all aspects still go. This is Kennedy Launch Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 CST 08:16 12/1

PAO This is Kennedy Launch Control. The 16 minute mark has just been passed. We're at 15 minutes 53 seconds and counting. The Astronaut Crew standing by for some important functions that will be coming up in a minute or so as the Apollo spacecraft goes on full internal power on the fuel cells onboard. Up to this time in the countdown, an external power source also has been applied to conserve those fuel cells. The external power source is removed. The Astronauts will take a look at the status of their power system onboard and report it back to the spacecraft control center. The Astronauts also will arm their hand controllers onboard the spacecraft and we will be ready to proceed to also place the emergency detection system on its automatic mode. Our countdown is still proceeding very satisfactorily as we come up on the 15 minute mark. The flight azimuth is the same. About 5 minutes ago there was an update given to the spacecraft computer. No changes were required because our countdown is right on time. 14 minutes 53 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control. T minus 10 minutes 55 seconds and counting. Count down still running smoothly as astronaut Dave Scott onboard the spacecraft checks out a key abort circuit. This is a special communications system with only about 3 or 4 people on it. These are the people who can recommend an abort to the spacecraft commander if required. These people include the launch operations manager Paul Donnelly, the spacecraft communicator here in the control center astronaut Vance Brand, spacecraft head conductor Skip Chauvin, and Houston flight director Jerry Griffin. We've checked out this special communication system and Dave Scott confirms that all is well. The count down proceeding Jim Irwin now reading off some checks on the status of the fuel cells as we continue to go. We'll go on an automatic sequence here in the count down starting at the 3 minute 7 second mark on the count from that time down we will be automatic with the count down given by the computer. This will wind up with ignition of those 5 engines in the first stage at the 8 point 9 second mark in the count down the engines will build up to their full thrust, the computer will make a determination that we have 90 percent thrust in all 5 engines and that will be the signal for commit or to release the vehicle. Our count down still proceeding 9 minutes 33 seconds and counting. This is Kennedy Launch Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/26/71, 08:28, MC14/1

PAO This is Kennedy Launch Control T minus 5 minutes, 55 seconds and counting. We're still GO. Just - we're about to come up with some status checks now to determine the final status. In the mean time, the lunar module test conductor, Fritz Widick has come in over the circuits and informed the spacecraft commander Dave Scott that lunar module Falcon and the rover are GO. Dave Scott thanked him for this and then also received a report from spacecraft test conductor Skip Chauvin that the command ship which will be have the call sign Endeavor also is GO. We've just completed our status report and the launch operations manager Paul Donnelly the launch director Walt Kapryan and the Mission Director, Chet Lee, all have given their go's. We're standing by for the swing arm to retract to its full fallback position. It's moving now as we approach the 5 minute mark in the count. Coming up on the 5 minute mark. Mark T minus 5 minutes and counting we're GO on Apollo 15. This is Kennedy Launch Control.

END OF TAPE

PAO This is Kennedy Launch Control. We just passed the 3 minute 30 second mark in the count. The terminal sequencer has been armed and we are GO. Launch Operations Manager Paul Donnally just wished the crew good luck and Gods speed and received an expression of thanks from all 3 crew members. We will be coming up shortly on the automatic sequence. 3 minutes 10 seconds, Firing command enable, firing command ON. We have the firing command. We are now on the automatic sequence and the tanks in the 3 stages of the Saturn 5, that contain those propellants, will begin to pressurize. The countdown is still proceeding and we are now at 2 minutes 50 seconds and counting. We understand that there was an estimate that there are more than a million people in the area here to view the launch. Traffic has been heavy since 2 o'clock this morning. The beaches are packed and the roads are packed. 2 minutes 35 seconds and counting. We are monitoring our status board here in firing room 1. Our ready lights are on concerning the spacecraft. Our emergency detection system instrument unit preparations are complete, and the automatic sequence is continuing. 2 minutes 20 seconds and counting. We now have second stage liquid oxygen and third stage liquid oxygen supplies pressurized as the countdown continues. Coming up in the 2 minute mark. We'll be standing by for the cueball cover to be retracted shortly atop the Saturn V vehicle. Mark T-minus 2 minutes and counting. Still going well. Propellants stable onboard the vehicle. The crew here in the firing room monitoring the more than 300 redline values, watching temperatures and pressures to insure they do not go above nominal. In the case that it did, any one of these Key people could call in to hold the countdown. 1 minute 36 seconds and counting; still going well. The pressurization sequence is still continuing in the vehicle. We're now 90 seconds away from liftoff. All still going well. We'll go on internal power with the vehicle at the 50 second mark in the count. We now get indications from our status board that all is still going well, and the third stage is completely pressurized. Coming up shortly on the 1 minute mark, we're now 70 seconds and counting. Second stage tanks are pressurized as our countdown continues. Mark T-minus 60 seconds and counting on Apollo 15. The Astronauts are GO. Launch vehicle and spacecraft components all GO as our countdown proceeds. Now 50 seconds; we have the power transfer. The vehicle now on the battery power on the vehicle and all is still going well. Lunar Module Pilot, Jim Irwin making some final checks now, passing the 40 second mark. Spacecraft Commander Dave Scott now is

PAO made his final check, that is alining the guidance system. 30 seconds and counting. The guidance system will go internal at the 17 second mark. Now 25 seconds. We have complete clearance to launch. We are GO. 20, 15 seconds, guidance internal, 13 12 11 10 9 8 ignition sequence start. Engines ON. 5 4 3 2 1, all engines running. Launch commit, Liftoff. We have liftoff at 9:34 A.M. Eastern Daylight Time. The tower is clear.

SC And we have a roll program.
CAPCOM Roger.
CAPCOM We've good thrust on all 5 engines.
SC Thanks Gordo, the roll is complete.
CAPCOM Roger.
SC And we have a PITCH program.
CAPCOM Roger. PITCH.
CAPCOM Stand by for mode 1 BRAVO. Mark. 1 BRAVO.
SC Roger. 1 BRAVO.
PAO Booster Systems Engineer reports to Flight Director that S1C stage looking good.
CAPCOM 15, Houston. Everything looks perfect down here.
SC Okay, looks cleared up here, Gordo.
PAO Going through maximum dynamic pressure at this time.
PAO 9 miles downrange, 13 - 14.5 miles height.
SC CHARLIE
CAPCOM Mark 1 CHARLIE now.
SC Roger. 1 CHARLIE.
PAO Each of the S1C's -
CAPCOM Roger.
PAO Each of the 5 S1C engines gulping 3 tons of fuel per second.
SC Inboard.
CAPCOM Roger. Inboard.
PAO Flight dynamics reports GO for staging.
SC PITCH stage.
CAPCOM Roger.
CAPCOM 15, Houston. You have good thrust on the S2.
All 5 are good.
SC Okay.
PAO 73 miles downrange, 47.9 altitude.
SC 7.7.
CAPCOM Roger.
SC Tower SEP.
CAPCOM Roger. We confirm the skirt SEP. You're mode 2.
SC Roger. Mode 2.
SC (garble)
CAPCOM Roger.

APOLLO 15 MISSION COMMENTARY 7/26/71 CDT 08:31 15/3

PAO Coming up on 10 000 feet per second mark.
Down range 131, altitude 66.
CAPCOM 15, Houston. At 4 the guidance has converged.
The CMC is GO. Everything looks good.
SC Okay Gordo. Looks good up here.
PAO Now at 35 percent of the velocity needed to
orbit. Down range 190 miles. Altitude 79.
CAPCOM 15, Houston. 5 minutes. Everything looks
nominal. You're GO.
SC Okay Gordo. Thank you. Looks good up here.
PAO 40 percent of velocity needed.
SC Roger.
PAO Down range 271, altitude 88.
PAO Predicting nominal shutdown on the S2 stage.
CAPCOM (garble) times are nominal. The level will be
8 plus 34, and S2 cutoff at 9 plus 09. Over.
SC Roger. 8 plus 34 and 9 plus 09.
CAPCOM Standby for S4B to COI.
SC Mark.
CAPCOM You have S4B to COI now.
SC Roger. S4B to COI.
PAO 380 miles downrange, altitude 94.5, velocity
15 000 feet per second.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 6:30 GET 08:41 CST 16/1

PAO A thousand feet per second.
CAPCOM Stand by for S-IVB to orbit capability.
Mark, do you have it now?
SC Rog, S-IVB to orbit.
PAO Down range 479, attitude 96 now approach-
ing 65 percent of velocity needed for orbit. The velocity
now is 16 700 feet per second. Official time of liftoff
34 minutes 00 seconds .79.
SC Inboard.
CAPCOM Roger, Inboard.
PAO Down range 660 60 miles, attitude 95
miles, 78 percent velocity required for orbit.
CAPCOM 15, Houston, go ahead.
CAPCOM What's that again, 15?
SC Houston, 15. We didn't call you, have
you got something?
CAPCOM You've had (garble) and the thrust
looks good.
SC Okay.
CAPCOM Is that level (garble) time now?
SC Roger.
PAO About 6 seconds to staging.
CAPCOM Stand by for mode 4 capability. Mark,
you have mode 4 now.
SC Rog, and and a good stage.
CAPCOM Roger.
PAO Booster reports thrust okay on the S-IVB
stage.
CAPCOM You've had -- you have good thrust on
the S-IVB.
SC Roger.
CAPCOM 960 miles down range, 94.7 attitude.
Velocity 23 230.
CAPCOM 15, Houston. Everything is looking
perfect. Predicted cutoff time 11 plus 37, over.
SC Roger, 11 plus 37.
PAO 1281 miles down range, 93.4 altitude,
97 percent of velocity, 98 percent of velocity required.
25 143 feet per second.
SC Okay cutoff. 11 plus 34.
CAPCOM Roger.
PAO Booster confirms the S-IVB has shutdown.
SC Okay, Houston gimbal motors are off and
the S-IVB oxidizer is 40 and the fuels about 31.
CAPCOM Roger, 40 and 31.
SC Okay, Gordon, we got ourselves into
937 by 88.9, shut down on a VI of plus 25595, H dot plus
00008, altitude plus 00932.
CAPCOM Roger, out. Copy.
CAPCOM 15, Houston, IU shows you in a 92.5 by

APOLLO 15 MISSION COMMENTARY 7/26/71 6:30 GET 08:41 CST 16/2

CAPCOM 91.5 radar confirms that and the booster
is safed.
SC Okay, Gordon, good job. It was a very
smooth ride all the way.
CAPCOM Roger.
CAPCOM 15, Houston, the booster is configured
for orbit, over.
SC Roger.
CAPCOM 15, Houston. Have your Z torquing angle.
SC Okay, go ahead.
CAPCOM Minus decimal 1 degrees. One tenth of
a degree minus.
SC All right. Minus .1.
CAPCOM That's correct.
PAO We've had loss of signal through Bermuda.

END OF TAPE

PAO We've had loss of signal through Bermuda. About a minute out of Canary Islands. To recap a moment, the measured orbital, here is a call now to the crew.

SC Go ahead Houston your okay.

CAPCOM I hear you loud and clear.

SC Okay, retro B type pressure is about 41 on the oxidizer and about 21 on the fuel.

CAPCOM Roger 41 and 21.

PAO Apollo 15 in a 92.5 by 91.5 nautical mile earth orbit. 1 mile out of perfectly circular. Communication through the Canary Island tracking station. For about 4 minutes and 11 seconds total pass time.

PAO Coming up on loss of signal through Canaries.

CAPCOM 15, Houston, about 35 seconds to LOS and we have nothing further for you. We'll see you at Carnarvain as shown on the check list of 52 over.

SC Okay, Carnarvain at 52.

PAO Flight dynamics officer reports that the data coming from the Canary Islands tracking station confirms the initial measurements of the earth parking orbit, and we are expecting to acquire Apollo 15 again over the Carnarvain, Australia tracking station at 52 minutes ground elapsed time, about 30 minutes from now. And at 22 minutes 13 seconds ground elapsed time this is Apollo Control.

END OF TAPE

PAO This is Apollo Control 50 minutes 34 seconds, ground elapsed time in the mission of Apollo 15. Now approaching the Carnarvon, Australia tracking station. We're about a 6-1/2 minute pass over that station. Halfway through the first earth parking orbit. Next time they pass over Carnarvon or over Australian subcontinent the crew of Apollo 15 will be preparing for the translunar injection maneuver which the spacecraft in S-IVB stage will break out of earth parking orbit and begin the 3-day journey to the moon. Actually the targeting will be toward where the moon will be three days from now. Still about 30 seconds away from predicted time of acquisition by the antenna at Carnarvon. We've had acquisition of signal. Stand by.

CC Apollo 15, Houston through Carnarvon, over.

SC Rog, Houston, 15, you're loud and clear.

CC You are loud and clear also.

SC Okay the absolute checks are coming along very nicely. We're down through 21 on the checklist. And the cameras are out and Al has completed his alignment.

CAPCOM Roger.

CAPCOM I only have one comment, Dave Scott, for you, Go ahead.

SC Houston 15, on the H2 purge fuel cell 2 I cannot confirm since I had no readout of the flow indication or caution and warning associated with that flow.

CAPCOM Roger.

SC And, if you'd like, I could do it any time and perhaps you could confirm it.

CAPCOM This is Houston. We are unable to help you on confirming that purge down here, Jim.

SC Okay, understand.

CAPCOM Gordo, I've got the numbers on the P52 for you.

CAPCOM Okay, ready, copy.

CAPCOM Okay, U star is 33 and 41, noun 05 was plus 00001 and the torquing angles were minus 00019 plus 00021 minus 00061 and they were torqued out at 5 zero minutes.

SC Roger, copied. Torquing angles are minus 00019 plus 00021 and minus 00061. Over.

CAPCOM That's affirm.

SC Thank you.

PAO This is Apollo Control cabin pressure aboard Apollo 15 holding at 5.7 pounds per square inch. Heart rates for Scott, Worden, and Irwin, respectively, are 70, 83 and 88.

SC Houston, one other comment, apparently sometime during launch the RCS-B secondary propellant isolation valve closed and we recycled it and got (garble) back.

CAPCON Roger, Dave.

APOLLO 15 MISSION COMMENTARY, 7/26/71, 0925 CDT, 00:50 GET 18/2

PAO Apollo 15, Houston about 15 seconds to LOS,
estimating the United States at 1:30 g.e.t.

SC Fine, Roger, 130.

PAO And we've had loss of signal through the
Carnarvon, Australia tracking station. We're standing by
now for the post launch press conference at press site 39 at
Kennedy Space Center and at 59 hours, 22 minutes, ground
elapsed time this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 1:29 GET 10:04 CST 19/1

PAO This is Apollo Control. We join the conversation in progress with Apollo 15 through Goldstone.

SC Houston, 15. Would you put the (garble) clear, Dave, and would you put the IU UPTTELL to ACCEPT, Please?

CAPCOM IU UPTTELL ACCEPT.

CAPCOM Okay, we're going to update the IU now vector based on tracking at Carnarvon. We'll have you leave that in accept all the way through the states pass, when you get a better track here across the states, we'll update it again before the (garble) over.

SC 27 on the check list. The docking probe is out. Looks good. Standing by for a sequence arm and a logic check when you're ready.

CAPCOM Roger. We can do that now.

CAPCOM Go ahead.

SC Okay. Logic one on now. Logic two on now.

CAPCOM Logics are dead. Your go for power on.

SC Okay, and we had one other little one, at about an hour we noticed that the primary and secondary propel and isolation valves on quad DELTA were barber pole, we cycled the switch and they are now gray and the RCS checks okay.

CAPCOM Roger.

CAPCOM I have a TLI plus 90 and liftoff plus 8 abort pads when you're ready.

SC Stand by one please, Gordon.

CAPCOM Okay.

SC Getting a little UV here.

SC Okay, Gordo, I'm ready for the TLI pad.

CAPCOM Okay, this is the TLI plus 90 abort pads.

SC Okay.

CAPCOM TLI plus 90, SPS/G&N. Noun 47 is 66938 minus 052 plus 190. GET for ignition is 004195699. NOUN 81 minus 04254 plus 401 plus 49217, attitude 180 166 002. HA is NA. HP plus 00210 49401 634 49208. Sextant star is 40 0795 359. Foresight star NA. NOUN 61 plus 1604 minus 03000 10990 34492, GET for 05G 017 43 58. GDC align stars are Deneb and Vega. 112 128 356. No ullage Go ahead.

CAPCOM 15.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/26/71, 1009 CDT 1:34 GET 20/1

CAPCOM 15, Houston.

CAPCOM Apollo 15, Houston. Over.

CAPCOM Apollo 15, Houston we are not reading you.

Over.

SC Okay, Houston there is a breakup in the VHF and Jim lost some of the first part of the transmission could you go through it again?

CAPCOM Okay, just what do you need?

SC Noun 47 through roll pitch and yaw.

CAPCOM Okay, Jim, Noun 47 is 66938 minus 052 plus 190. Noun 33, 004 19 56 99. Noun 81 minus 04254 plus 00001 minus 49 217, correction on Delavesy is a plus 49217. Roll pitch and yaw are 180 166 002. Go ahead.

SC Okay, readback, TLI plus 90 SPS G&N 66938 minus 052 plus 190, 004 19 56 99 minus 04254 plus 00001 plus 49217 180 166 002. NA plus 00210 49401 634 49208 40 0795 359 NA plus 1604 minus 03 000 10990 34492 0174358. GARBLE and Vega 112 128 356 and no ullage.

CAPCOM Okay, Jim your readback is correct. Liftoff plus A pad is 00800 6076 minus 175 027 06. Go ahead.

SC Roger. 00800 6076 minus 175 027 06.

CAPCOM Roger and I will have the TLI pad when you are ready for that one.

SC All right, go ahead I'm ready for the TLI pad.

CAPCOM Okay, GARBLE 24023 additive TLI 180 045 001. Burn time 555 104011 35599. SEP attitude 359 077 320. Section attitude 301 257 040. R2 aline 045 -

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 CDT 1014, GET 1:39 21/1

CAPCOM to aline 0450 0380 ordeal start 5645 YAW
001. Ejection time 41600. Go ahead.

SC Roger. TLI readback 24023 180045 001 555
104011 35599 359 077 320 301 257 040 0450 (garble) 5645
001 and extraction at 41600.

CAPCOM Okay. A little static on 2 readbacks. Read
back YAW for extraction and R2 aline, please.

SC Roger. 040 and 0450.

CAPCOM Okay, readback is correct, Jim.

CAPCOM 15, Houston. We have a question regarding
the primary and secondary isolation valve. Over.

SC Go ahead.

CAPCOM We're wondering if you happened to just
notice them. Barber pole at 1 hour or did you notice them
CLOSED at 1 hour? Over.

SC Oh no. We just noticed that they were CLOSED
at an hour, But apparently in the shuffle here, somebody
probably bumped the 1 switch which would do it.

CAPCOM Roger. You can't tie them to any other
action or event there then. Is that right?

SC Negative.

CAPCOM Okay, thank you.

SC Okay.

CAPCOM 15, Houston. IU uptel to block. We have
put in a second IU noun vector based on stateside data.

SC Tell to block.

CAPCOM 15, Houston. We'd like POO and ACCEPT.

SC POO and ACCEPT. Got it.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/26/71, 1019 CDT, 1:45 GET 22/1

CAPCOM 15, Houston are you up to the block, you have a new state vector now.

SC Roger. GARBLE on the block.

CAPCOM Roger, my mistake. Also have a short update for your TLI checklist ordeal angles because of the slight performance difference in the S-IVB unit.

SC Okay, go ahead, Gordo.

CAPCOM Okay, on the launch checklist page L2-30, bottom of the page. Tell me when you have it.

SC Go ahead Gordo.

CAPCOM At 56 minutes through FDAI number 1 the pitch equals 17 degrees rather than 16 and at the top of the next page ensure FDAI number 1 pitch equal 14 degrees rather than 13. Over.

SC Roger. Copied, 17 degrees instead of 16 and 14 instead of 13.

CAPCOM Okay, then on the next page 2-32 at 5955 change 7 degrees to 8 degrees ensure FDAI number 1 pitch equal 8 degrees.

SC Copy 8 degrees.

CAPCOM One more on the cue card TLI down slightly below the middle the long cue card that the CDR uses 54 minutes. The 24 degrees should be changed to 25 degrees. Ordeal 300 lunar 25 degrees.

SC Okay, we've got that 25 degrees.

CAPCOM And then there will be a 1 degree difference on the rest of the ordeal numbers.

SC Okay, looks like they all fit.

CAPCOM That's it.

CAPCOM Apollo 15, Houston. We're about to LOS, nothing further we'll see you at Carnarvon at 2:25 GET.

SC All right, roger.

PAO This is Apollo Control, apparently we have had loss of signal through the Vanguard tracking ship in mid-Atlantic. During that pass over the United States, the numbers for the upcoming translunar injection maneuver were passed up to the crew. This maneuver slightly over an hour from now, planned at 2 hours 50 minutes ground elapsed time. The burn lasting 5 minutes 55 seconds of the S-IVB third stage will place the spacecraft in trajectory toward the moon.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 GET L:51 CDT 10:25 23/1

PAO trajectory toward the moon. It will increase the velocity by some 10 414 feet per second. The measurement of the Apollo 15 earth orbit as it passed over the Texas Tracking Station, the display here in Mission Control showed the present orbit at 96.5 by 93.8. During the launch phase, the heart rates of the crew of Apollo 15 were 110 for Scott, 104 for Worden and 115 for Irwin. We'll be communicating with the crew of Apollo 15 through the Canarven Station at ground elapsed time of 2 hours 24 minutes and some odd seconds and almost continuous communications through Aria or Apollo Ranged Instrumented Aircraft between Carnarvon and the Hawaii Tracking Station. The TLI burn begins just about the commencement of the passover Hawaii and at 1 hour 51 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/26/71, GET 2:24, CDT 10:58 24/1

PAO This is Apollo Control, 2 hours 24 minutes ground elapsed time. We've just had acquisition through the Carnarvon station and Gordon Fullerton giving them a call at this time.

CAPCOM GARBLE.

CAPCOM Yes, I'm fine also. Okay.

SC Houston, 15 we're down to the middle of the TLI probe and everthing is in order.

CAPCOM Roger.

CAPCOM Testing, Houston.

SC Houston, 15.

CAPCOM We're showing a manual attitude which is in rate and impulse and we recommend rate command.

SC Roger, rate command. And the pyros are on.

CAPCOM Roger.

PAO Flight Director, Jerry Griffin, preparing to poll his flight controllers here in the mission control room for GO/NO-GO which shows in the flight plan to be passed up through one of the aircraft in the mid-Pacific. However, it looks like the GO/NO-GO signal will be voiced up to the crew just prior to the loss of signal here at Carnarvon. 22 minutes - mark 22 minutes until ignition for translunar injection.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/26/71, GET2:29, CDT 11:03, 25/1

CAPCOM Apollo 15, Houston.

SC Houston, 15.

CAPCOM You are go for TLI.

SC Roger, go for TLI.

CAPCOM In the S-IVB oxidizer looks like about 36
and the fuel looks like about 19.

SC Roger.

PAO We've had loss of signal at Carnarvon.

However we will leave the circuit up live for the relays through the aircraft in the Pacific - relay through the Guam station. For any continuing conversation with the crew of Apollo 15. Seventeen minutes 35 seconds until ignition for translunar injection. The S-IVB with the Apollo 15 spacecraft now weigh around 103 000 pounds as you were 309 630 pounds. After the burn is complete the spacecraft will have shrunk to 103 thousand pounds approximately. After translunar injection burn velocity will rise from the present 25 620 feet per second to 35 655 feet per second, an increase of slightly over 10 000 feet per second. About 20 minutes after burn cutoff the S-IVB will maneuver to the -

END OF TAPE

PAO Will maneuver to the separation attitude, and at 3 hours 20 minutes ground elapsed time, the Apollo 15 spacecraft will separate and do a turn around maneuver and prepare to dock with the lunar module which is housed in the spacecraft LEM adapter on top of the S4B stage. The 4 panels will shed away. The spacecraft after docking with the lunar module is ejected from the S4B stage. The lunar module landing gear struts are attached at the knee joints to fittings inside the spacecraft lunar module or SLAAs it is called in acronisms, acronyms. Springs eject the spacecraft at slightly over 1 foot per second. We're still about 2 minutes away from acquisition by the first of two ARIA aircraft, from then on we should have fairly continuous coverage until Hawaii. And the translunar injection burn, which is now some 14 minutes 06 seconds away from this point will begin just at the start of the Hawaii pass and from then on until going behind the Moon, some 3 days from now, we'll have continuous coverage - continuous contact with Apollo 15. We've had acquisition of signal with the first ARIA aircraft. During the docking separation and docking maneuver, we should have a live color television picture from the command module Westinghouse television camera.

CAPCOM Apollo 15, this is Houston through ARIA. Over.

CAPCOM Apollo 15, this is Houston through ARIA. Over.

SC Rog, Houston, 15, you're about one by one through ARIA.

CAPCOM Roger. You're about 3 by; clear enough to understand.

SC Rog, we have somebody else on the loop with us, too.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 GET 2:39 CDT 11:13 27/1

PAO Coming up on 10 minutes to TLI ignition.
Mark, 10 minutes.

SC Are the S-II sep right?

CAPCOM Roger. Sep right.

SC It looks like we have a small repress (garble) about
22 and 23 on the fuel pressure, over.

CAPCOM Roger, Dave. It's just bearly, readable,
understand you are getting a normal retrack. Looks good down here.

SC Okay. Don't worry about it.

PAO Plot boards here in Mission Control
Center on the center screen are being set up now to monitor
the translunar injection burn. Some 5 minutes 43 seconds
away from ignition should be in about a minute and a half
acquired by the second ARIA spacecraft -- aircraft in the Pacific.
Booster reports that the tanks and S-IVB stage have been
pressurized.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 GET 2:44 CDT11:18 28/1

CAPCOM Apollo 15, Houston. Through ARIA number 2.
Over.

SC (garble)

CAPCOM 15, Houston. You're way down in the static
and I can't hear you transmit. Over.

SC (garble)

PAO This is Apollo Control. There was some doubt
in the Booster Engineers mind that the engine bell of the S-IVB
J-2 engine had been properly chilled down from the data that
he got from the Aria I aircraft. However, his new data
coming in through Aria II has confirmed that the chilldown
procedure prior to start has been accomplished as scheduled.
Some 2 minutes 15 seconds away from TLI ignition. Continuing
to standby as we approach acquisition at Hawaii in some 2
minutes from now. Still standing by through the Aria II
aircraft. Communications through Aria II have been somewhat
scratchy - almost unintelligible from the spacecraft.

CAPCOM Roger. Average G.

SC Sep light.

CAPCOM Roger. Sep light.

PAO Looking at ignition time of 2 hours 50 minutes
1 second ground elapsed time. Cutoff at 2 hours 55 minutes
54 seconds. Total spacecraft velocity at cutoff should be
35608.7 feet per second. Coming up on 20 seconds. Mark
20 seconds to TLI ignition.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71, 11:23 CDT, 2:49 GET, 29/1

SC We have ignition.
CAPCOM Roger, ignition.
CAPCOM 15, Houston; we're showing good thrust.
PAO Velocity building up. Now 26 270, 26 347
feet per second. Resulting apogee building up, now 679
miles 706; clicking over very rapidly.
SC Okay. S-IVB pressure is 40 and 30 and we
had a little surge at about 1 minute.
CAPCOM Roger, that was PU shift and that looks -
the thrust looks good.
SC Okay.
PAO Velocity continuing to build 26 700 feet per
second; resulting apogee 1661.
PAO Coming up on 30 thousand - -
SC and we're about half way through. Pressures
are steady at 40 and 30 and ORDEAL is tracking right on
through.
CAPCOM Roger 15 at 3 minutes, it looks completely
nominal to us.
SC Roger.
PAO Coming up on 30 000 feet per second - mark
30 000 feet per second resulting apogee 4685 nautical miles.

END OF TAPE

SC Hey, Houston. We have about a minute to go. We're tracking 39 and 30 on the pressures and ordeal is about 0.

CAPCOM 15, Houston. Roger. Looks good here.

CAPCOM 15, Houston. We're estimating cutoff about 4 seconds earlier than the PAD time.

SC Roger. Understand. 5 plus 51.

CAPCOM That's affirmative.

PAO Velocity rapidly approaching TLI cutoff speed.

SC Okay. Shutdown 5 plus 51.

CAPCOM Roger.

SC S4B tank pressure is about 32 coming down on the oxidizer and about 28 coming down on the fuel.

CAPCOM Roger.

PAO Cutoff velocity 35 522 feet per second. Resulting apogee from that maneuver 290 682 nautical miles.

CAPCOM 15, Houston. We're getting a lot of static on the (garble)

SC Roger, Gordo. I've got to cut off (garble)

CAPCOM Go ahead.

SC (garble) plus 02 (garble) 5 delta v (garble) and altitude is 167.4.

CAPCOM 15, Houston. Most of your readback is drowned by static. Let's wait a little while and try it again.

SC Okay Gordo.

SC And Houston, we have the S4B in orb rate.

CAPCOM Roger. You're loud and clear now.

SC Okay.

SC Okay, Houston. I've got the data if you want to copy.

CAPCOM Okay. Sounds good now. Go ahead again.

SC Okay. DSKY was 35599 BG plus 1 -

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/26/71, 2:59 GET, 11:33 CDT 31/1

SC BG plus 145 and the Delta VC minus 14.9, TFC plus .02, and for your information, the H dot was 4353 and the H was 167.4 at cutoff.

CAPCOM Roger. Say you know what that figure plus 02 was?

SC Yeah. TFC.

CAPCOM Roger, Okay. Copied all that. For your information the maneuver to the TD and E attitude should start about 1 second earlier than the flight plan. 3 10 53.

SC Roger. 3 10 53.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/26/71, GET 3:04 CDT 1138, 32/1

PAO This is Apollo Control. Tracking now showing the spacecraft at 1 383 nautical miles out, directly over the Corpus Christi, Texas tracking station but beginning the tail stand and loop backward to the west as the earth rotates beneath the trajectory of the spacecraft. Velocity dropped off somewhat from the initial cutoff velocity of 350 000 and some odd feet per second down to 30,436 feet per second. Estimated time of closest approach to the moon now 78 hours, 34 minutes ground elapsed time. Continuing to stand by and monitor the preparations for the maneuver to separation attitude - the actual separation of the command service module from the spacecraft LM adapter and docking with lunar module and finally the ejection of the Apollo 15 spacecraft from the S-IVB stage which will have done it's job quite well apparently in what is shaping up, thus far, to be a completely nominal mission. This is Apollo Control at 3 hours, 8 minutes, 37 seconds ground elapsed time. Standing by live on air/ground.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 GET3:09 CDT 1143 33/1

PAO Cabin pressure onboard Apollo 15 now 5.5 pounds per square inch. Heart rates currently for Scott, Worden and Irwin respectively at 65, 69 and 69.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 GET 3:14 CDT 11:48 34/1

PAO Flight Director Jerry Griffin polling the Flight Controllers in the room for a GO for transposition docking and extraction. Heard no NO-GOs so far. He's telling CAPCOM to tell them it's GO.

CAPCOM Apollo 15, Houston.

SC Houston, 15.

CAPCOM Everything looks good here. You're GO for transposition and docking.

SC Roger. GO for transposition and docking.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 GET 3:19 CDT 11:53 35/1

PAO This is Apollo Control. Apollo 15 now
3654 nautical miles out from Earth. Velocity now 25178 feet
per second. Total weight including the SPAN S-IVB stage
144 157 pounds. Continuing to monitor the air ground as the
crew of Apollo 15 prepares to turn around and move the Lunar
Module out of its garage. Three hours 21 minutes have been
live on the air ground. This is Apollo Control.

SC Okay, Houston, 15, 30 seconds.

CAPCOM Roger.

SC Okay, Houston, we've got a good set.

CAPCOM Roger.

SC And part propellant D secondary and DELTA
primary -- secondary with barber pole and they're both gray.
Now reset.

CAPCOM Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/26/71, GET 3:24, CDT 1158, 36/1

CAPCOM 15, Houston would you give us OMNI
BRAVO?
SC OMNI BRAVO.
CAPCOM Okay, Houston looks like you've got a good
LM in there and we're rolling now and the opening rates are
stopped and you should have a TV.
SC Roger, we haven't got the picture up here yet.
Standby and I'll give you a check on that.
SC Okay.
CAPCOM 15, Houston.
SC Go Houston.
CAPCOM Goldstone is receiving the carrier but we're
not getting any signal on the carrier for the TV. Over.
SC Okay, we've got a good picture on the monitor
up here.
CAPCOM Starting to get a black and white pic-
ture here, in Mission Control, take a little while to get
it through the converter.
CAPCOM 15, Houston, we're getting the picture now
and the LM is coming in the lower right hand corner of our
field of view.
SC Okay. Okay, Houston it looks like we have
a good high gain antenna. Do you want us to give you the
high gain or stay on the OMNI?
CAPCOM Stand by.
CAPCOM We'll take the high gain, Dave.
SC Roger. Going high gain. Okay, Houston, we're
in auto in medium - it looks like we got a good lock.
CAPCOM Roger and we're getting a very good picture
here. It's over on the right hand field of view.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 GET3:29 CDT1203 37/1

CAPCOM 15, Houston, request wide beam with (garble)
SC Wide beam.
CAPCOM 15, Houston. The centering on the picture
is good now and we're getting an excellent quality picture.
SC Very good. We're almost there.
SC Capture.
CAPCOM Roger.
SC We're retracting.
CAPCOM Roger.
SC Hard dock, Houston.
CAPCOM Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/26/71, 3:34 GET, 12:13 CDT, 38/1

SC Okay, Houston, 15.
CAPCOM Go ahead.
SC Okay, all went fairly nominally and the only different thing we've noticed is the SPS thrust light on the EMS is now on, and we don't know when it came on; somewhere in the process there.
CAPCOM Roger. I understand the SPS thrust light is on.
SC And all the switches are off.
CAPCOM Apollo 15, Houston.
SC Go ahead.
SC Houston, 15.
CAPCOM 15, Houston. We'd like you to pull both SPS pilot valve circuit breakers on Panel A.
SC Okay, that's being done.
SC They're both open.
CAPCOM Roger.
PAO This is Apollo Control. Apollo 15 now 7460 nautical miles out from Earth. Velocity continuing to decrease, now 20 197 feet per second; fairly quiet crew this mission. On the off chance they will talk some more, we'll leave the circuit up. At 3 hours 43 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

PAO Crew of Apollo 15 presently pressurizing the lunar module.

PAO This is Apollo Control. Spacecraft systems engineers here in mission control center are trouble shooting unusual valve position indication on telemetry and in the spacecraft cockpit for the valves in the propellant system for the service module propulsion engine, and are sorting out which malfunction procedure the crew should go through. There was no danger of the engine igniting by itself because of this, but it is desired that the problem be ironed out. Continuing to monitor the Apollo 15 air/ground circuit up and live. Now showing cabin pressure on the command module at 4.2 pounds per square inch. We have no pressure reading yet in the lunar module but the crew apparently has begun pressurization of the LEM. Distance now 8 774 nautical miles out from earth. Velocity continuing to decrease 19 065 feet per second. 3 hours 51 minutes ground elapsed time, still live, this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 GET 3:48 CDT 12:33 40/1

CAPCOM Apollo 15, Houston.

SC Houston, 15. Go ahead.

CAPCOM At 3:55 54 about 40 seconds non propulsive
vent will be opened on the booster.

SC Roger Gordo. Understand.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/26/71, 4:11 GET, 12:43 CDT, 41/1

CAPCOM Apollo 15, Houston, the vent should be complete now.

SC Okay, let me see.

PAO This is Apollo Control some 4 minutes away from ejection of the command service module docked to the lunar module, from the S-IVB stage, which has now completed its nonpropulsive vent. The spacecraft now 12 036 nautical miles out from Earth; velocity dropped off to 16 839 feet per second. The only anomaly encountered thus far after translunar injection, is a couple of service module propulsion system valves were noted, both onboard and on telemetry, as being in the open position when they should be in closed position. The crew was instructed to open some circuit breakers upstream of these valves to give a double redundancy against accidental start of the engine, which would be a pretty remote possibility in the first place, because some other steps have to be taken prior to the start in any case. After the transposition, or after the ejection from the S-IVB, the CAPCOM will pass up to the crew the malfunction procedure to go through to track down and troubleshoot what the slight anomaly is in the SPS valve position indications. At 4 hours 14 minutes - -

CAPCOM Go ahead.

SC Rog, Colonel, we're ready to get the pyro armed and logics on now.

CAPCOM Stand by.

SC Okay, logics coming on; logic 1; logic 2.

CAPCOM You're go for pyro armed.

SC Rog.

SC Okay, Houston, we'll sep at 4:18.

CAPCOM Rog. Just standing by.

SC Okay, Houston, we got a good sep.

CAPCOM Roger.

SC Okay, Houston, 15. We have the S-IVB in sight and it looks like it's probably about - oh 7 or 8 hundred feet away.

CAPCOM Roger.

SC Houston, 15.

CAPCOM Go ahead, 15.

SC Roger. We have the S-IVB in sight and it looks like it's 500 feet or so away.

CAPCOM Roger. We copied the first time; if it's okay with you and looks clear, we'll command the yaw maneuver.

SC Roger. And it looks like a clean burn out there.

CAPCOM Roger.

CAPCOM We'll be sending the yaw command at 4:31.

SC Roger.

SC Okay. We can see the thruster activity on

APOLLO 15 MISSION COMMENTARY, 7/26/71, 4:11 GET, 12:43 CDT, 41/2

SC the S-IVB.
CAPCOM Roger.
SC Looks like a light mist and a sort of conical
shape - maybe - oh a hundred feet long or so.
CAPCOM Rog.
SC And, Houston, as a side-light, we can verify
that the Falcon has his rover aboard.
CAPCOM Very good.
SC Houston, 15.
CAPCOM Go ahead.
CAPCOM Go ahead, 15.
SC As we watch the S-IVB drift away here, how
about passing along to Jim Harrington at the Cape, congradu-
lations from the crew to the launch team for a superior job.
CAPCOM Okay, we sure will.
SC Smooth all the way and right on time.
CAPCOM Jerry Griffin reports that he's already done
that.
SC Good.
CAPCOM So we'll second it from the crew.

END OF TAPE

CAPCOM Think I did from the crew.
CAPCOM Apollo 15, Houston, over.
SC Houston, 15.
CAPCOM I was thinking about your SDS thrust on light
problem and we would like you to verify the positions of the
EMS function and mode switches.
SC Rog, off and stand by.
CAPCOM Roger.
SC Houston, this is 15. We're starting to configure for
charging battery B.
CAPCOM Roger.
CAPCOM Apollo 15, Houston.
SC Houston, 15.
CAPCOM I think you may have missed a Verb 66 right
there just after LM ejection. We need one now.
SC Roger, it's works. And Houston, 15, S4B looks
nice and stable out there, your going up for your basic
manuever as far as we are concerned.
CAPCOM Okay, fine. We're just about to ask you on
that.
SC Okay.
CAPCOM It'll be started at 4:40.
SC Rog, 4:40. And we're just about 90 degrees
a beam.
CAPCOM Roger.
SC Okay, Houston. We see the S4B moving very
slowly.
CAPCOM Roger.
SC Houston, this is 15.
CAPCOM Go ahead 15.
SC Do you want us to terminate the charge when
I'm reading 39.5.
CAPCOM Stand by. Jim, we'll call you based on inter-
grated AMP hours that we figure out down here.
SC Okay, fine.
SC Houston, 15.
CAPCOM Go ahead.
SC Okay, we have a LMP CM Delta P of plus .2
at the present time.
CAPCOM Roger, Dave, plus .2.
CAPCOM 15, Houston.
SC Houston, 15, go ahead.
CAPCOM We need to have you reinitialize the high
gain. We'd like you to set PITCH minus 30 YAW plus 98 and
go to react, over.
SC Roger we copy. Minus 30 and plus 98.
CAPCOM Roger.
SC Houston, 15. How do you read?
CAPCOM Loud and clear.

CAPCOM 15, Houston. Watch your middle gimble.
SC Roger.
CAPCOM 15, Houston.
SC Houston, 15. Go ahead.
CAPCOM At 501 20, we'll be starting a launch dump
through the S4B engine, and we have the REFSMMAT when you're
ready for it, for the B52.
SC Okay, you want POO and ACCEPT?
CAPCOM Affirm.
CAPCOM 15, Houston, the computer is yours. You have
a new REFSMMAT on the trunnion bias has been zeroed.
SC Roger, Gordo, thank you.
PAO This is Apollo Control at 5 hours 16 minutes
ground elapsed time. Distance from earth now 20 412 nautical
miles. Velocity 13 305 feet per second.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 GET 5:16 CDT 13:49 43/1

PAO Velocity 13 335 feet per second. The crew of Apollo 15 can hardly be called verbose. It's been extremely quiet during this period after translunar injection. The crew will be settling down for an eat period in less than an hour at which time it will probably be even quieter. Standing by on air-to-ground up and live, this is Apollo Control.

CAPCOM Apollo 15, Houston. Over.

SC Go ahead, Houston.

CAPCOM When you get a free moment, we have a reasonably short procedure in line with checking out the SPS thrust light. Over.

SC Okay, stand by.

SC Go ahead Gordo. Ready to copy.

CAPCOM We see you're starting the P52. This shouldn't interfere, but we can wait if you wish.

SC I'm just going to copy the procedure and we'll do it later.

CAPCOM Okay. It's the kind of thing we have to watch on the ground as you do it so it's probably not even worth writing down.

SC Okay, let's wait then till after P52.

CAPCOM Allright.

SC Houston, 15.

CAPCOM Go ahead.

SC Okay, Gordo. If you're reading, I've got the gyro torquing angles up and I'll torque them out at 5:30.

CAPCOM Okay, we're reading the DSKY. Understand 530.

PAO This is Apollo Control at 5 hours and 32 minutes ground elapsed time. Apollo 15 now 22 102 nautical miles out from earth, velocity 12 844 feet per second. The crew most likely, it's pretty hard to tell what they're doing at this time. Most likely though, they're in an eat period, scheduled in the flight plan to start at 6 hours. Here in the Control Center the Systems Engineers are devising a simple test to track down some apparent short circuit indications in the valve system to the Service Propulsion System. It's what is known in Flight Control vernacular as funnies. There's no great concern over the onboard and telemetered indications of these 2 valve positions. The crew was instructed to open some circuit breakers upstream of the 2 valves, but at some time in the not too distant future the CapCom will relay to the crew, the instructions for troubleshooting the anomaly. At 5 hours 34 minutes ground elapsed time, this is Apollo Control.

CAPCOM Apollo 15, Houston. Standing by with the liftoff plus 15 abort pad.

SC Stand by.

SC Okay, Gordo, standing by for the pad.

CAPCOM Okay, it's GET of ignition of 01500. DELTA-VT

4926 minus 175 -

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/26/71, GET 553, CDT 1428, 44/1

CAPCOM Six minus 175 051 20. Go ahead.
SC Stand by. Okay, Gordo, give me that - is that a P37 pad that you have there?
CAPCOM That's right, Jim, I should have used that terminology.
SC Go ahead.
CAPCOM Okay, 015 00 time of ignition. 4926. Longitude is minus 175 and GET for 400K is 051 20. Over.
SC Copied, 015 00 4926 minus 175 051 20.
CAPCOM That's correct, Jim. Go ahead.
SC 15, Houston when ya'll get a chance we'd like to go with this SPS thrust light check.
SC Okay, Gordo onboard left couch down let's go ahead and try it.
CAPCOM Okay, stand by I'll get everybody watching. Okay, first of all I'd like to be sure that both the pilot house and circuit breakers on panel eight and both Delta V thrust switches are off.
SC Okay, Houston. Both pilot valves are open and the delta V subswitches are off.
CAPCOM Okay, now when we do the following stuff, we'd like you to watch the SPS thrust light and watch it for changes either going out or changes in intensity. We're trying to determine if it's a high or low resistance short and if it gets greater that will tell us something about the short with any one of these actions.
SC Okay.
CAPCOM Okay, first item is put the thrust hand controller clockwise and watch for light.
SC Gordo, do you mean the THC to translation hand controller?
CAPCOM Yeah, that's what I'm after THC clockwise.
SC Okay, we'll go clockwise with it. We're clockwise and no change.
CAPCOM Okay, put the THC back to neutral.
SC Roger.
CAPCOM Okay, SPS thrust switch direct on.
SC Okay SPS thrust direct on.
CAPCOM Any change in light?
SC I didn't see any change. And it's off.
CAPCOM Okay, back to normal.
SC Rog, back to normal.
CAPCOM Okay, we'd like you to do the first part of EMS delta V check, top of page G2-5 and just the first steps down to the - don't have to do the bias check but the first six steps there.
SC Right.
CAPCOM Idea here is to check for possible short in that delta V test circuit somebody cut the light on.
SC Okay, Gordo, that part of the check has been run and shut off at a minus 21.4 in ten seconds and the SPS light - the SPS thrust light got distinctly brighter during the excelleration period.

APOLLO 15 MISSION COMMENTARY, 7/26/71, GET 553, CDT 1428, 44/2

CAPCOM Roger, Al, copy.

CAPCOM Have Al see if there is anything else they
want to do here.

SC Roger.

CAPCOM Okay, Al, I guess no more questions right
now we'll mull that over a little bit.

SC Okay, Gordo.

END OF TAPE

PAO This is Apollo Control at 6 hours 16 minutes ground elapsed time.

CAPCOM I've got a short update for your erasable load update as contained in the back on the G&C check list. This is three addresses to update, over.

SC Okay, go ahead.

CAPCOM Turn to page G9-4.

SC Stand by.

SC Okay, Gordo, go ahead. I've got the G&C check list of them.

CAPCOM Okay, on -- 9-4, the first one is changing NVDX static drift compensation for the X gyro. Under load ALFA, the octal ID number 11 which now reads 77332 change that to 00377. Over.

SC Understand that's alpha octal ID11 where it now says 77332, change that to read 00377.

CAPCOM That's affirmative. And load bravo. ID's four and five are changed. This change is TSM to correspond with actual lift-off. And load 4 which is now 30560, change that to 32251. And while you're still writing change the next one load ID number 5 from 10 000 to 26 157.

SC Roger, understand. That's column bravo ID's 4 and 5, change 4 to 32251, and 5 to 26157.

CAPCOM That's correct. That takes care of it, Al.

SC Okay.

PAO This is Apollo Control, Apollo 15 now 27 621 nautical miles out from earth, velocity now 11498 feet per second. Spacecraft communicator, Gordon Fullerton passed up some trouble shooting procedures on the apparent short circuits that are causing some spurious indications not only in the spacecraft cockpit, but also here in the Control Center through telemetry the pilot valves were opened, the DELTA-V lights turned off on the EMS (or the Entry Monitor System), thrust controller was rotated clockwise and back to neutral, ESPS thrust switch was turned to DIRECT ON and then back to NORMAL, and the first six steps of the entry monitoring - entry monitor system DELTA-V check were run. It was noticed the SPS engine light ON was brighter during the deceleration period and at that point the trouble shooting was terminated for the time being while the Systems Engineers here in Mission Control mull over the situation. Also the people in the Spacecraft Analysis Office, the so-called SPAN room. No great amount of concern here over the apparent short circuit that's causing these indications. But, further attempts will be made to isolate what the cause of the indications are. Guidance, Navigation, and Control Officer should be briefing the flight director before too long on what his recommendations are. And at 6 hours, 22 minutes ground elapsed time, still live on air ground, this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 GET 6:33 CDT 15:09 46/1

CAPCOM 15, Houston, over.
SC Houston, 15, go.
CAPCOM If you're not using the optics we suggest
you zero them there, we noticed them drifting.
SC Okay, thank you.
SC We've been taking turns looking at the earth
through the telescope. Fantastic sight.
CAPCOM Rog. Dave.
SC As a matter of fact this sure would be a
neat place for a space station out here.
CAPCOM Roger.
PAO This is Apollo Control at 7 hours 14 minutes.
Flight Director Gerry Griffin and his gold team of flight
directors - flight controllers have completed a handover
to Flight Director Milton Windler and the maroon team.
CAPCOM for the maroon team is Astronaut Karl Henize. We're
estimating the change of shift news conference for 4:00 PM
Central Daylight Time, 4:00 PM Central Daylight Time.
Apollo 15 is 10,526 nautical miles from earth. Velocity
up - delay that, distance is 33,154 miles, velocity is
10,526 feet per second. This is Apollo Control. The
change of shift News Conference will begin momentarily in
the MSC News Center briefing room. We will take down the
release line during this News Conference. We will tape any
air-ground transmissions and play those back following the
News Conference. At 7 hours 30 minutes, this is Mission
Control, Houston.

END OF TAPE

PAO This is Apollo Control at 7 hours 59 minutes. During the change of shift News Conference there were 3 brief air-ground conversations totaling 2 minutes 40 seconds. Most significant of these was the first one about 20 minutes ago in which CAPCOM Karl Henize passed up the three possibilities on the short circuit causing the SPS light and advising the crew we will pass up a procedure to them about 6 PM Central time. We will play that tape now and then stay up live.

CAPCOM Apollo 15, this is Houston.

SC Hello Houston, Apollo 15.

CAPCOM The results that we got out of that last test procedure didn't cause many problems for us. I guess the best we found out was that we don't have a simple problem like stuck EMS relay. And there's a lot of thinking going on down here and at the present time we line up three possibilities, depending upon where the ground is in the system. And the first one is that it's a ground that simply turns on the light and it affects nothing else. Second possibility that it's a ground that's going to light the engine early when you put on the Delta-V thrust switches. And there's a third possibility, that the ground is upstream of the pilot valve and that we'll blow the pilot valve circuit breakers and lose that bank, if we're unlucky. We're busy down here working on a - we're busy down here working on a procedure that we could use at midcourse correction 1 to decide which of these three possibilities is the right one. And we're talking about getting this all worked out and sent up to you in about 2 hours.

SC Okay, understand. Good luck.

CAPCOM Righto.

CAPCOM 15, this is Houston.

SC You have (inaudible) .9.

CAPCOM Roger. We read Delta-V .9.

CAPCOM 15, this is Houston.

SC Houston, 15.

CAPCOM We're seeing a low O2 repress package pressure down here. Okay, we'll take that back. We have a suspicion that we have a low O2 repress package, and I would like to have an onboard readout of your pressure there.

SC Okay. Houston, it is a little low we just never finished filling it after we pressurized the pump.

CAPCOM Rog.

CAPCOM They say they'd like to go to fill now and get it filled up.

SC Rog. We'll do that.

APOLLO 15 MISSION COMMENTARY 7/26/71 GET 8:03:20 CDT 16:34 47/2

PAO This is Apollo Control. We're back live now on the release line. Apollo 15 is maneuvering to the attitude to perform the P23 CIS lunar navigation sitings.

PAO This is Apollo Control at 8 hours 19 minutes. Apollo 15 is 39,282 nautical miles from earth, velocity 9,629 feet per second. Command Module pilot Al Worden is now performing the CIS lunar navigation tasks scheduled in the flight plan. It's going well.

END OF TAPE

APOLLO 14 MISSION COMMENTARY 7/26/71 CST 1655 GET 8:21:00 48/1

PAO This is Apollo Control at 8 hours 51 minutes. Apollo 15 is 42,124 nautical miles from earth, velocity 9,269 feet per second. The evaluation of the trouble shooting and operational procedures to be taken because of the SPS thrust-on light problem is continuing. We expect the procedure that will be used during the midcourse correction 1 time to be ready to pass up to the crew by 6 PM central daylight time. There is the possibility that we will continue with another trouble shooting procedure prior to the midcourse time. The back rooms are taking a look at that right now. We'll continue to stand by live for any air ground. This is Mission Control, Houston.

PAO This is Apollo Control at 9 hours 6 minutes. The cislunar navigation sightings are continuing aboard Apollo 15. We do plan tonight to go through the procedure in an attempt to isolate the suspected short circuit in the SPS light. These procedures will be passed up to the crew shortly, and they will be performed at the time of the midcourse correction number 1 at 11 hours 55 minutes elapsed time, that's about 8:30 PM central daylight time. There is a possibility that some additional trouble shooting will precede these procedures, that has not yet been determined, but the plan is to definitely go through the procedures tonight in an attempt to isolate the location of the short circuit. Continuing to monitor live this is Mission Control, Houston.

CAPCOM Apollo 15, this is Houston.

SC Houston, 15, go.

CAPCOM Hey, would you ask A1 to give us about 3 seconds on the noun 49 so we can read them out down here.

SC Oh, very well.

CAPCOM 15, this is Houston with an update for your procedures for UV photos.

SC And Houston, that last noun 29 looks like 60 and 16.

CAPCOM We copy.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 1755 CDT 0920 GET 49/1

SC --And Houston, that last NOUN 49 looked like a 60 and 16.

CAPCOM We copy.

SC Houston, this is 15. Ready on that update concerning the UV photo.

CAPCOM Roger, on page 3-15 in the flight plan, in the left column about the 17th line down we have 2 frames with filter number 2.

SC (Garbled) I found that line.

CAPCOM Roger, and instead of 2 frames at 20 seconds, we would like 1 frame at 20 seconds; and we would like a second frame at 2 seconds.

SC Roger, I copy 1 at 20 seconds and 1 at 2.

CAPCOM Roger, the reason for that is that they have recently measured a secondary light leak in that filter and they need a different exposures like this to really separate the two peaks in the filter trans-missitivity. Incidentally, this is going to pertain to all the UV photography of the earth on down the line, but we'll update it as we come to them. And 15, we have a preliminary procedure about to come up to you to see if we can isolate whether this ground and the SPS system is in Bank-A or Bank-B, and that'll be coming up in just a few minutes. We --

SC I understand.

CAPCOM And we'd like to do that before we start the UV photography.

SC Very well.

CAPCOM 15, this is Houston, I have the preliminary procedure I spoke about and we're hoping you might be able to do it while A1 works with the P23.

SC Okay, go ahead.

CAPCOM You might refer, if you want to see what's going on, to Drawing A.9 down in area E3. We're playing with the DELTA-V thrust switch and the idea is this: first of all, let's open the Group-5 circuit breakers on panel 229, both main-A and main-B. That's back up to the SPS pilot valves on panel 8 which we also want to open. Verify that.

SC Okay, Group-5, main-A and main-B on 229. Stand by.

SC Okay, both of those are open.

CAPCOM Roger, we verify Group-5 both open, and the SPS pilot valves both open. Then, we'd like to take the DELTA-V thrust A switch and try to balance it right in a center position, tease it back and forth a little bit to see if you can get any flickering in the SPS thrust ON light.

SC Okay, stand by.

CAPCOM Jim, let's - let's hold up a little bit before we do that. We don't - we're not all set up down here to watch that also. So let's - let me read on through the procedure.

APOLLO 15 MISSION COMMENTARY 7/26/71 1755 CDT 0920 GET 49/2

SC Okay.

CAPCOM If the light does flicker, of course, that's going to isolate in this case if we were playing with the DELTA-V thrust A switch. That will isolate the problem into the A bank of valves. If we don't see any flicker, then we'll go ahead and try it with the B bank; actually, we would like to go ahead and do it with the B bank also. So, stand by a moment.

SC Okay, I'm standing by.

CAPCOM We'd like to have a high-gain medium.

SC High-gain medium.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 CST 1805 GET 9:30:00 50/1

CAPCOM 15, this is Houston. We're ready to go ahead. Verify again the group 5 breakers and the SPS pilot valve breakers and then let's tease that Delta V thrust A switch. Try to balance it in a central position.

SC Okay, will do. We note that trying A.9 echo 3 doesn't seem to fit what you're doing.

CAPCOM Actually it's area echo 3 and 4 and it simply shows you the Delta V thrust switch is there.

SC Oh okay, okay.

CAPCOM The light has a contact, whether that switch is on or off and we would like to balance it half way between so that we don't have a contact.

SC Okay, here goes Delta V A now. Okay A is up and on and the SPS thrust light is off.

CAPCOM Would you confirm that the Delta V thrust A switch is up and the light went out, is that correct?

SC That's correct. It's still in the up and on position and it went to the on position, up, the light went out.

CAPCOM Thank you.

SC I'll just leave it there while you think about it.

CAPCOM Thank you, that's stand by.

CAPCOM 15 this is Houston. We'd like to feel our way ahead here, and we'd like to have you put Delta V thrust A back to off.

SC A is off, and the light remains off.

CAPCOM We copy. 15, this is Houston. Our telemetry confirms both of your observations and we would now like to have you cycle bravo.

SC Roger. Bravo is up and on, the light is off. Now Bravo is off and the light remains off.

CAPCOM Copy. 15, we'll sit tight and think about that for a while, thank you.

SC Rog.

CAPCOM 15, this is Houston. As a final check as to what's happening in that switch, we'd like to have you tap around the Delta V thrust switches a bit. To see if any light flickering comes on.

SC Roger, in work. Would you believe it came on.

CAPCOM We copy and we saw it down here. Okay, with the light now, let's cycle Bravo on and try to tease it in the middle if it stays on.

SC Okay, cycling bravo. Okay no change at all with bravo cycling several times through the middle.

CAPCOM We copy. Okay leave Bravo off and let's cycle A again.

APOLLO 15 MISSION COMMENTARY 7/26/71 CST 1805 GET 9:30:00 50/2

SC Roger. Okay right in the center of the contacts with A right between the 2, I can get the light to go out, but now when I go up to on, up on, the light comes on again. Now I've come back to the off position and the light's off. So I think you've isolated your problem.

CAPCOM Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 GET 9:46:40 CDT 18:21 51/1

CAPCOM 15, this is Houston. We're willing to stop playing with the light problem at the present time. We'd like to verify that both DELTA-V thrust switches are off. And we'd like to have a group 5 circuit breakers both closed, but please keep the pilot valves circuit breakers open.

SC Okay, DELTA-V thrust verified off. Pilot verified open and all closed to group 5.

CAPCOM Thank you.

SC Gram 8.9.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 GET 9:53 CDT 18:28 52/1

PAO This is Apollo Control at 9 hours 53 minutes. This troubleshooting with the 15 crew has just completed. It does give us confidence that the Delta-V thrust switch A is faulty whether through contamination or whether something is loose in the switch, we don't know, but it does give us confidence that both banks of ball valves in the service propulsion system are okay. We do not now plan to proceed with the procedure that had previously been planned for midcourse correction 1. We're confident that we can develop procedures to operate bank A safely whenever we burn the engine.

SC Omni Delta, please.

SC Roger. Omni Delta.

CAPCOM 15, this is Houston.

SC Houston, 15.

CAPCOM Let's summarize our situation with that thrust on light. The telemetry we got down here, we actually have two lights which show up in that area, E4 and 5 on diagram 8.9. Gave us some rather confusing data that we don't understand yet, but we'll be working on it, but we do feel confident enough that there's no need to fire the engine at the present time and since the midcourse 1 is a correction of 2.8 feet per second we don't think that we'll be having a midcourse 1. For your information at the present time midcourse 2 looks about like 5.0 feet per second.

SC Okay, understand. We'll just hold tight, skip midcourse 1, standby for 2.

CAPCOM Roger. And 15 be advised we'll have a flight plan update in the near future.

SC Roger. That was a pretty good S-IVB wasn't it?

CAPCOM Roger. Hey, and you can tell A1 up there that those look like pretty good P23 markings.

SC Okay, he's glad to hear that.

SC Very good, Karl.

CAPCOM 15, if you'll give us ACCEPT, we'll send up a new state vector.

SC (garble)

CAPCOM Say again 15.

CAPCOM 15, you can have your computer back.

SC Roger.

PAO This is Apollo Control at 10 hours 20 minutes. The Apollo 15 crew now taking ultraviolet photographs of the earth as scheduled in the flight plan. Apollo 15 is 49,511 nautical miles from earth now. Travelling at a velocity of 8,407 feet per second.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 GET 10:21 CDT 18:55 53/1

CAPCOM We would like to have OMNI Bravo, please.
SC Houston, 15.
CAPCOM 15, This is Houston.
SC Rog, Carl. Would you go back and recheck
the atti . . the attitude for the UV pictures of the moon?
CAPCOM Stand by, we'll check that, the numbers you
have in the DSKY are what we have in the Flight Plan.
SC Houston, 15. As you were on that, looks
like we are all set up.
CAPCOM Roger.
CAPCOM 15, This is Houston. Could we bring up the
high gain with the angles in the Flight Plan?
SC Roger, Houston. Stand by.
CAPCOM 15, This is Houston. I have a Flight Plan
update whenever you can copy it, to be followed by a P-27
update and a P-37 plot data.
SC Stand by. Okay Carl (garble) flight plan.
CAPCOM Okay, as is obvious, you can delete all of
the mid-course activities beginning there at 11:21 running
through the burn status report, and the other activities
this evening can be moved up so that you can go to bed as
early as 12 hours GET, if you wish. A couple of notes here
is that we do want you to stay up till 12 hours in order
that we can finish a battery charge in progress. And also
that waste water dump, be sure to . . to do the water dump
before you start PTC.
SC Okay, we understand that.
CAPCOM And, I'm . . I've got a P-37 for you, plus
25 hours if you are ready.
SC Stand by one. I'm ready for the P-37 for
25 hours.
CAPCOM Roger. 02500 4621 minus 175 07521 03500
6821 minus 174 07451 04500 5605 minus 175 09906 06000 5448
minus 175 12306 and that's the end.
SC Readback. 02500 4621 minus 175 07521 03500
6821 minus 174 07451 04500 5605 minus 175 09906 06000 5448
minus 175 12306.
CAPCOM That's all correct. The next one I have is
a P-27 update.
SC Stand by.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 CST 1918 GET10:43:30 54/1

SC Stand by. Okay, I'm ready on the P27.
CAPCOM Roger, it's the purpose, V71 GET 11:45:00,
index 21 01501 00001, 71465, 41437, 76654, 45425, 77003,
52553, 72602, 54007, 75455 55217, 76267, 55324, 00402,
05560, and that's all.

SC Okay, on the P27 it's 71114500, 21 01501,
00001, 71465, 41437, 76654, 45425, 77003, 52553, 72602,
54007, 75455, 55217, 76267, 55324, 00402, and 05560.

CAPCOM That's all correct, thank you Jim.

PAO This is Apollo Control at 11 hours 2 minutes.
Apollo 15 is 52 thousand 749 miles from earth, velocity 8,101
feet per second. A short time ago we advised the crew that
they could delete all of the midcourse correction 1 activities,
and move up the other activities so that if they wish they
may go to bed at 12 hours elapsed time, about 1 hour from
now. As yet we do not have an indication from the crew
what they plan to do. We'll continue to stand by and monitor
live for any air ground conversations. This is Mission
Control, Houston.

SC Houston, Houston, 15.

CAPCOM 15, this is Houston.

SC Roger Al, we've got the gyro torquing angles
for P52. We'll talk about them in a minute.

CAPCOM Roger, we've copied them, and -

SC Houston, this is 15 now. Looking at the oxidizer
pressure on the SPS, looks like it's a little low. I just
wondered what you all read down there?

CAPCOM 15, this is Houston. We're reading a pressure
of 168 down here on the SPS oxidizer and that's normal at
this time. We expect it to be a bit low because of absorption
in the helium.

SC Okay, thank you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 GET 11:15:00 CDT 1950 55/1

CAPCOM And 15, this is Houston. When you doff your biomed harnesses, we very much have you double check those sensors we have been getting poorer reading in respiration from all three of you and we would like to have you report any anomalies in how they are rigged on you.

SC Roger. Will do that.

CAPCOM You can send that down with the evening report.

SC Okay. Right on, CAPCOM hearing is just a little fainter than it was.

CAPCOM Roger.

SC A little bit earlier - -

CAPCOM 15, this is Houston. Anytime you have the time to copy down about six lines of information I could give you a general update on the UV filter photography.

SC Okay, stand by 1 call.

CAPCOM And 15, we'd like to have you verify that the waste water dump has been terminated.

SC That's a verify.

SC Okay, Karl, I'm ready to copy flight plan change relative to UV.

CAPCOM Roger. The changes the same as I gave you before. When your shooting the earth two frames with filter 2 - what was formally 2 frames with filter 2 exposure time 20 seconds in the future it will be 1 frame filter 2 with an exposure time 20 seconds. And 1 frame filter 2 exposure time 2 seconds. And the following is a - places that this occurs in the flight plan in the future. First is page 3-38 line 17 I believe we probably passed that one already. The next one is - negative we haven't passed that one yet. The next one is page 3-57 line 16. The third is page 3-167 both at 123 hours 49 minutes and 123 hours 56 minutes. The next is page 3-352 line 16. The next is page 3-378 line 16 and the final one is page 3-402 parenthesis it says here earth UV line 16.

SC Roger, I copied all that, Karl.

CAPCOM Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 1143 GET 2017 CDT 56/1

SC Houston, 15.
CAPCOM 15, this is Houston, go ahead.
SC Okay, Karl, would you check the page for PTC
and let me know what that verb 49 attitude is that says,
verb 49 maneuver to PTC noun 20 090 and 000.
CAPCOM 15, this is Houston. I understand that you
used the present roll - the one you have now, I believe,
is 169.6 and then the other two numbers give you pitch and
yaw.
SC Ah, affirm, roger Colonel. Thank you.
SC And, Houston, 15, we're maneuvering to PTC
attitude now.
CAPCOM Roger, 15, we copy.
CAPCOM 15, this is Houston. We'd like to have a LM
CM DELTA-P whenever you can check that number for us?
SC Okay, Karl, stand by 1.
SC Okay, Houston, the DELTA-P is point - plus
.4 and we're gonna secure the high-gain and give you
OMNI BRAVO.
CAPCOM Roger, 15, we copy.
SC And Houston, we're doing an 02 purge on the
fuel cell. Presently purging fuel cell 3 noticed a fuel cell 3
caution light.
CAPCOM Roger, we copy.
PAO This is Apollo Control at 11 hours, 50 minutes
Apollo 15 is 56 527 nautical miles from earth, velocity
7844 feet per second.
CAPCOM 15, this is Houston, we'd like to have OMNI
Charlie.
SC Houston, 15 sitting in your lap.
CAPCOM Roger, that last comment was to give us OMNI
Charlie.
SC Roger, Charlie.
CAPCOM 15, this is Houston.
SC Houston, 15, go ahead.
CAPCOM Your spacecraft rates are low enough now to
spin up for PTC, but we'd like for you to verify first that
all of your dumping has been finished.
SC Affirm.
SC Karl, We'll hold off for a little bit here
and finish up the dumping before we go into PTC.
CAPCOM Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 GET 12:06:00 CDT 20:40 57/1

PAO This is Apollo Control at 12 hours 6 minutes. The spacecraft rate of revolution that we've set up for this passive thermal control throughout the rest period is 3 tenths of a degree per second. This will provide thermal balance for the spacecraft and its systems during the rest period. Apollo 15 now 57,742 nautical miles from earth, travelling at a velocity of 7,745 feet per second.

CAPCOM 15, this is Houston. In connection with the respiration sensor problem, we'd like for you to go through a special procedure for us before you doff your biomed harnesses.

SC Okay, standby 1, Karl. Okay, Houston, ready to copy special procedure.

CAPCOM I'm sorry, I don't think it needs copying but we'd like all three of you when you go into the doffing phase here we'd like all three of you to pull off the impedance pneumograms those are the two respiration sensors back on your kidneys there. Pull them off, and let any - let any trapped air get out and then reseal them and give us a couple minutes of readout down here to see if that improves the situation.

SC Roger. We'll do that.

CAPCOM 15, this is Houston. We can terminate the battery Bravo charging.

SC Roger.

SC Houston, this is 15. We have terminated the charge on battery B.

CAPCOM Roger, 15. We copy.

PAO This is Apollo Control at 12 hours 40 minutes. Apollo 15 has just passed the 60,000 mile mark outbound to the moon. Distance now 60,188 nautical miles. Velocity 7,555 feet per second.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 GET 13:27 CDT 21:34 58/1

SC Houston, 15.
CAPCOM 15, This is Houston.
SC Okay, Karl, it looks like we are getting organized and we will go ahead with the PTG now, do you have any preference on which jets to use?
CAPCOM Roger, we would like to use the BD jets.
SC Understand. BD's, I guess that would be B-2 and D-2, huh?
CAPCOM Say again, Al.
SC Guess that means you want us to use B-2 and D-2, huh?
CAPCOM That's affirmative, and we would like you to . . . to hold the spinup until we . . . okay, we're able to give you a GO for spinup now.
SC Okay, understand. The rates are favorable for spinup now.
CAPCOM That's affirmative.
SC Okay, Karl, this is Apollo 15, if the rates still look good down there, we are ready to go to PTC.
CAPCOM That's affirmative, Al, go ahead and spin her up. We'd like to select OMNI Bravo now.
SC Rog, in to OMNI Bravo.
PAO This is Apollo Control at 13 hours 14 minutes. Apollo 15 now 62,606 nautical miles from earth. Velocity 7,377 feet per second.
CAPCOM 15, This is Houston. How's the view up there?
SC Houston, 15. It is fantastic, Karl, you ought to be here, man.
CAPCOM I'm eating my heart out.
SC Karl, I think you said that just to be mean.
CAPCOM And how does 13 hours of continuous zero-G feel?
SC I think everybody is pretty well adjusted, Karl, no problems at all and we've finished dinner and we're happy.
CAPCOM Very good.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 CST 2201 GET 13:27:00 59/1

CAPCOM 15, this is Houston on your PTC, when it started out it looked okay, but we find that it's diverging now and we're going to have to reinitialize it. We suggest this time around that we use a rate of .375 in noun 79, that might help.

SC Okay .375 in noun 79.

PAO This is Apollo control at 13 hours 39 minutes. We've asked the crew to try again on passive thermal control. Did not achieve the 3 10ths of a degree per second that we were looking for after the PTC stabilized. We've asked them to spin it up a little faster to begin this time, that should achieve the rate we're looking for after they stabilize.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 GET 13:45:00 CDT 2219 60/1

SC Houston, 15.
CAPCOM 15, this is Houston.
SC Roger, Karl. The rates look like there down again. We'll try PTC again.
CAPCOM Roger, we'd like to have you verify that all the vents are secured before we spin it up again.
SC In work.
CAPCOM And 15 in this damping process we'd like to make sure that all of the jets on two adjacent quads are disabled.
SC Roger.
CAPCOM And, 15 as a part of trying to figure out what went wrong with that first PTC. We'd like to know whether or not you went into any exercise period after we spun it up.
SC That is negative, Karl.
CAPCOM Roger.
SC And, Houston LMP CDR recycled (garbled).
CAPCOM Dave, we missed that last transmission could you say again.
SC Rog. The LMP and CDR have recycled the pneumogram, and we just wondered if you had seen any improvement in data.
CAPCOM Okay, he's looking at it now and he says, yes it has improved.
PAO This is Apollo Control at 13 hours 55 minutes. Apollo 15 distance now 65 120 nautical miles velocity 7 118 feet per second.
CAPCOM 15, the surgeon says it's okay for the CDR and the CMP to doff their bio-med harnesses, now.
SC Okay, did that recycling do any good?
CAPCOM Roger. The recycling cleared up the respiration data we have down here very nicely.
SC Okay, good.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 1400 GET 2234 CDT 61/1

CAPCOM 15, this is Houston, everything down here looks good for this spinup.

SC Okay Karl, we'll spin 'em up then.

CAPCOM 15, this is Houston, I'm sorry to tell you that that spinup didn't work very well. We're going to have to reinitialize again.

SC Okay Houston, try it again.

CAPCOM And Al, the -- stand by.

SC Rog Karl.

SC Houston, 15.

CAPCOM Go ahead.

SC Yeah Karl, I think the problem this time was because I hesitated just momentarily thinking I had it free and I ended up in HOLD.

CAPCOM Ah ha, thanks, thanks for the information.

SC Okay.

CAPCOM And 15, we think that your jet configurations were all Okay that time around, but we'd like to confirm that during damping you disable all jets on two adjacent quads, and then for the spinup you use only B-2 and D-2.

SC That's affirm, Houston, that's affirm.

CAPCOM 15, this is Houston, everything down here looks GO for the spinup.

SC Okay Karl, we'll try it once more.

CAPCOM That looks like a very good start.

SC Okay Karl. We'll try it once more.

CAPCOM That looks like a very good start.

SC Okay, Karl.

CAPCOM 15, this is Houston.

CAPCOM 15, this is Houston.

SC Houston, 15. Go.

CAPCOM It looks like we've got it pretty well wrapped up for your rest period. We've got 3 or 4 small items to remind you here. Crew status report is outstanding onboard readouts, we'd like and whenever your ready we're ready for an E-memory dump.

SC Okay. We're about at that point of the check list and we'll give you the whole page at one time. Stand by one.

CAPCOM Okay.

END OF TAPE

APOLLO 15, MISSION COMMENTARY, 7/26/71, CDT 2300, GET 14:26:45 62/1

PAO This is Apollo Control at 14 hours 28 minutes
As the Apollo 15 Crew prepares to wind up a long day, the
spacecraft is 6780 nautical miles from earth, velocity
6992 feet per second.

SC Okay Houston 15. Were ready for the memory
dump for you.

CAPCOM Okay 15. We're ready to go with it.

SC Okay, here it comes. And Houston 15, we've
got the rest of the briefing checklist if you are ready to copy.

CAPCOM Roger 15, we're ready to copy.

SC Okay. Crew status report, everybody's in
good shape, no medication today. Onboard readouts BAT C
37.0, Pyro BAT A 37.2, Pyro BAT B 37.2, RCS A 94, B 92,
C 94, D 94, and the water has been chlorinated the H2 bandss
have been cycled, the valves are all verified, got your
EM memory dump. The cabin is in 5.7 Retro 2 is closed,
and I guess we're ready to go to sleep communications
configurations.

CAPCOM Roger 15, we copy all that and the surgeon
has a question about, were there any obvious anomalies
Bio Med Harness?

SC No as a matter fact, we were just discussing
that, Al and I both have taken them off and the sponges
are all still quite damp, and have their color and they're
all sticking very well. I think the system looks real
good.

CAPCOM Very good. Thank you.

SC Roger.

CAPCOM 15 this is Houston, I guess we're ready
to go to the presleep configuration.

SC Roger.

CAPCOM Good night.

SC Okay, good night.

CAPCOM Incidentally 15, your PTC's are looking very
good.

SC Oh, that's good.

SC By the way Carl it's time for you to get
some sleep too, isn't it?

CAPCOM Roger, it's been a long day for all of us.

SC Yeah, I think you're a couple or three
hours ahead of us.

CAPCOM Not that much.

PAO This is Apollo Control at 14 hours 38 minutes
We've said good night to the crew after a long day. We'll
stay up live for a little while yet in case there are any
post scripts to the air to ground. You heard Dave Scott,
the Apollo 15 Commander report the crew was in good shape,
they've taken no medication. He gave an onboard read out

APOLLO 15, MISSION COMMENTARY, 7/26/71, CDT 2300, GET 14:26:45, 62/2

PAO of the battery and the reactions controls system, status. Passive thermal control appears to be working very well now after three tries to get it established. (garble)

CAPCOM 15 this is Houston, the noise was very bad then. Are you reading me?

SC Okay, I'm reading you on by. Just had a question to verify the sleep configuration in the S band is mode voice to OFF, that gives (garble) to the on voice.

CAPCOM That's affirmative. That gives us a little cleaner GM.

SC Roger.

PAO This is Apollo Control at 14 Hours 40 minutes and the crew has just turned the VOICE OFF. The light has gone out on the in coast console indicating the crew has thrown the switch. We'll take this line down now, if there is any further conversation we'll come back up. At 14 hours 41 minutes into the flight of Apollo 15 this is Mission Control Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/26/71 GET 15:14:15 CST 2348 63/1

PAO This is Apollo Control at 15 hours 14 minutes
APOLLO 15 is now 70 thousand 739 nautical miles from Earth;
velocity 6 thousand 835 feet per second. Flight Director
Glenn Lunney and his team of flight controlers are preparing
to take over here in the Missions Operations Control Room.
Shift should change in about 10 or 12 minutes. There will
be a change of shift News Conference in the Manned Spacecraft
Center News Center Briefing Room at approximately 12:15 A.M.
Central Daylight Time. We are estimating the change of
shift news conference for 12 15 A.M. Central Daylight Time.
This is Mission Control, Houston.

END OF TAPE

APOLLO 15, MISSION COMMENTARY, 7/27/71, CDT 00:12, GET15:39 64/1

PAO This is Apollo Control at 15 hours 39 minutes. In Mission Control we've completed a change of shift. Flight Director Glen Lunney, now on leading the flight team of flight controllers and our Capsule Communicator is Back up Command Module Pilot of Apollo 15 Vance Brand. Lunney has been reveiwing for the last 10 or 15 minutes with his flight controllers the status of the Mission and everything at this point appears normal and we're very close to the nominal for consumables such things as propellants, reaction control system propellants and oxygen and hydrogen. And the general assesment is that we have no problems. Lunney has been reveiwing a problem which occured earlier in the day, and that is the intermittent light on the SPS thrust and that problem being discussed as it was earlier in the day. At the present time Apollo 15 is traveling at a velocity of 6743 feet per second, current altitude 72 284 nautical miles. We'll be beginning the change of shift press briefing in the MSC News Center briefing room shortly and during that time we'll have the lines down, we'll record any conversation although, we do not expect any. The crew has been put to bed now for just about one hour and what will be a scheduled 10 hour rest period. This is Apollo Control Houston.

END OF TAPE

APOLLO 15, MISSION COMMENTARY, 7/27/71, CDT 1:14, GET 16:41, 65/1

PAO This is Apollo Control at 16 hours 41 minutes. The Apollo 15 crew now some 2 hours into a 10 hour rest period and it's settled down to a quiet routine here in Mission Control. One of the principle activities for the decom, the environmental and communications electrical engineer, systems engineer, in the control center is to come up with a set of procedures this evening, which can be used to check out that SPS thrust light by the crew tomorrow. At the present time Apollo 15 is traveling at a velocity of 6511 feet per second and the altitude now 76 290 nautical miles from earth. This is Apollo Control Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/27/71, 17:44 GET, MC66/1

PAO This is Apollo Control at 17 hours 44 minutes. Apollo 15 now in a passive thermal control mode with the spacecraft rotating at a rate of about 3 revolutions per hour to maintain the proper temperatures within the command and service module. This is the mode that was set up by the crew prior to beginning their sleep period. They're now about 3 hours into that rest period which is scheduled to last a total of 10 hours. And in Mission Control it's continued to be a quiet evening. Flight controllers primarily involved with reviewing the activities that will be coming up tomorrow and in the case of several of them, reviewing the situation with regard to the SPS thrust light and are working on procedures which will be used probably tomorrow to check that - check the light out. Apollo 15 at this time is travelling at a velocity of 6298 feet per second and that velocity continuing to drop off as the spacecraft increases its distance from earth, now 80 226 nautical miles from earth. This is Apollo Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/27/71 GET 18:41 67/1

PAO This is Apollo Control at 18 hours 42 minutes
The crew now has been asleep for over three hours. Flight
surgeon reports that they appear to be sleeping well. The
rest period began at 14 hours 41 minutes or a little over
four hours ago and it is scheduled to last a total of ten
hours. All systems on the spacecraft at present remain
unchanged. Everything is operating normally. We show a
cabin temperature of around 65 degrees, this temperature is
measured near the point where the air flows into the cabin,
it's somewhat lower than the actual free air temperature
in the capsule. Cabin pressure at around 5.3 pounds per
square inch which is also normal. Apollo 15 traveling at a
velocity 6124 feet per second now and at an altitude of
83 619 nautical miles from earth. This is Apollo Control
standing by.

END OF TAPE

APOLLO 15, MISSION COMMENTARY, 7/27/71, GET 19:44, 68/1

PAO This is Apollo Control at 19 hours 44 minutes Apollo 15, now traveling at a speed of 5950 feet per second and out to 87 222 nautical miles from earth. The crew is now about midway through a scheduled 10 hour sleep period. And things are perking along smoothly, both aboard the spacecraft, and here at Mission Control. Flight Director Glen Lunney has, for the last hour or so, been reviewing the status for midcourse correction, which is tentatively being planned for tomorrow. We won't have a firm decision on carrying out that midcourse correction scheduled at the second midcourse opportunity and the primary interest in conducting the maneuver at that time will be to get a check at that time of the service propulsion system. The spacecraft is continuing in its passive thermo control mode rotating slowly at the rate of about 3 revolutions per hour. This allows all sides of the vehicle to get equal exposure to the sun and to the cold of space, and to maintain the proper temperatures. This is Apollo Control standing by at 19 hours 46 minutes.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/27/71 515 CST 20:41 GET 69/1

PAO This is Apollo Control at 20 hours 41 minutes. With Apollo 15 now traveling at a speed of 5802 feet per second and out to 90 425 nautical miles from earth. The crew still sleeping soundly at this time. And we have a clock here in mission control that is currently counting down to the time that the crew is scheduled to be awake. That to be now some 4 hours 18 minutes away. The major activities, once the astronauts awake, will be a midcourse correction opportunity. The second midcourse correction opportunity, which comes at about 30 hours 56 minutes. And crew will also enter and make the preliminary checks of the lunar module, Falcon. In mission control it continues to be a very quiet evening and the major activity centering around preparation of procedures to be used for the midcourse correction, which would most likely occur at the second opportunity, 30 hours 56 minutes into the flight and a principle interest there to check out the service propulsion system engine. This is Apollo Control continuing to stand by.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/27/71, 21:48 GET, MC70/1

PAO This is Apollo Control at 21 hours 48 minutes. Apollo 15 now travelling at a speed of 5639 feet per second. We've watched that velocity decrease since coming on shift from about 6700 feet per second. And that speed will continue to drop off as the spacecraft moves farther from earth, farther from the influence of earth's gravity until the point that the lunar gravity becomes dominant and once again we'll see the velocity begin to pick up. We're showing now the spacecraft 94 130 nautical miles from earth. And about 3 hours 10 minutes left in the scheduled 10-hour rest period for the crew. Flight surgeon reports that they appear to have been sleeping soundly. The major scheduled activities when the crew awakens will be midcourse correction. That midcourse correction maneuver, the second opportunity, which will occur at about 30 hours 56 minutes into the flight and the second major activity following crew awake - awakening will be ingress into the lunar module and a check of systems there. This is Apollo Control standing by.

END OF TAPE

PAO This is Apollo Control 22 hours, 42 minutes into the flight of Apollo 15. The spacecraft now 96 960 nautical miles from Earth and the velocity 5518 feet per second. In Mission Control we're in the process now of beginning a shift handover. That will occur in about 45 minutes. Flight Director Jerry Griffin will be replacing Flight Director Glen Lunney and the Capsule Communicator spacecraft communicator on the upcoming shift will be Astronaut Joe Allen, replacing Astronaut Vance Brand. During the astronauts sleep period which is scheduled to end in about 2 hours the spacecraft systems have been performing normally. Everything appears stable and the astronauts, based on the biomedical data we're getting here on the ground, would have appeared to have been sleeping well. The Flight Surgeon reported a few minutes ago that there did appear to be some signs of activity indicating perhaps the crew is beginning to waken and move about. We will not have a change of shift press briefing following this shift. There has been no significant change in the status of things during the evening. A principal activity has been to review the status of the service propulsion system thrust light. Have reviewed schematic diagrams and determined what possibilities exist, what are the possibilities for a short circuit might exist and also to work on procedures for a burn of the service propulsion system engine which would probably occur at the midcourse correction to opportunity at 30 hours 56 minutes. At 22 hours, 44 minutes this is Apollo Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/27/71, 24:11 GET, 8:45 CDT, 72/1

PAO This is Apollo Control at 24 hours 11 minutes ground elapsed time into the mission of Apollo 15. Some 48 minutes remaining in the sleep period for the crew. Flight Surgeon reports that the only man wired for sound, that is connected to the biomedical telemetry, the lunar module pilot is still soundly asleep. Apollo 15 now 100 781 nautical miles out from Earth; velocity 5261 feet per second. Gold Team Flight Director, Jerry Griffin, is going over the day's activities - planned activities - with his team of flight controllers here in Mission Control after - during a handover now in progress. They're considering moving the midcourse correction burn number 2 up to about 28 and a half hours ground elapsed time, which would give a slightly larger burn than if it were done on the nominal time. This would be a conclusive test of the service propulsion system and the associated problems in the spurious signal onboard the spacecraft and in the control room here, that the valves are stuck open down in the propellant system. Meanwhile, astronaut Dick Gordon plans at 10:00 to run through the procedure in the Houston command module simulator prior to the time that the instructions are passed up to the crew, how to set up for this service propulsion system burn and the current thinking is that if the burn does not light off at the new time of 28-1/2 hours, an attempt would be made at the nominal flight plan time. 24 hours 13 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/27/71 GET 25:19 CDT 9:54 73/1

PAO This is Apollo Control 25 hours 19 minutes ground elapsed time. Apollo 15 now 105 083 nautical miles out from earth. Velocity 5196 feet per second. ECOM just reported to the Flight Director that the voice subcarrier to the spacecraft is ready for the days business. And it was thought they heard the crew calling, but apparently not. However, we're 20 minutes past the wakeup time. So, not to miss any of the first call to or from the crew we'll leave the circuit up at this time.

PAO This is Apollo Control. We're waiting for the crew to call or for Spacecraft Communicator Joe Allen to call the crew. We'll recap the present situation with the Service Propulsion System in which delta V light in the Entry Monitor System in the spacecraft cabin came on, which indicated the solenoid valve drivers on bank A in the Service Module Propulsion System had some sort of ground closing the circuit. At any rate, tests to confirm the quality of bank A in this system will be made at midcourse correction 2 which now is being considered to be rescheduled for about 28 hours 30 minutes ground elapsed time instead of the flight plan time which was at 30 55. This will be a SPS burn of about 7 feet per second, less than a second duration. Meanwhile, Richard Gordon at about this moment should be climbing into the Command Module Simulator in the crew training building at the Manned Spacecraft Center to run through the routine that will be passed up to the crew. When the crew wakes up Joe Allen will brief them on moving midcourse to forward, and after Gordon returns from the Command Module Simulator and the PAD for the midcourse correction 2 is passed up to the crew, the findings of simulating this procedure will be passed up also, with any changes in switch configurations and so forth. Standing by live on air/ground to begin the days work at 25 hours 25 minutes ground elapsed time, this is Apollo Control.

SC Houston, Apollo 15.

CAPCOM Hello Endeavour, this is Houston.

SC Good morning, Joe.

CAPCOM Good morning troops. Has the sun come up up there?

SC Oh yes, very bright all the way (garble)
We're going to give you our data here.

CAPCOM Roger Dave, we're standing by.

SC Okay, we all (garble)

CAPCOM Endeavour, this is Houston. Stand by on your report. You're broken up at the moment please.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/27/71 GET 25:29 CDT 10:04 74/1

CAPCOM Dave, this is Houston again. Go ahead,
our comm is not so noisy now.

SC Joe, this is Jim.

CAPCOM Roger, Jim. Good morning.

SC Good morning. Will it be okay now?

CAPCOM Roge, you're loud and clear now.

SC Okay, we figure we all got about 8 hours
of sleep. The duration of that sleep was different. Dave
figures it got us about three segments. Al got two and I
had about five different periods of deep sleep. On the
consumable's update at 25 20 RCS A 94 B 94 C 94 D 93. On
the H2 tank 195 293 and 381. O2 tank 191 293 396. Standing by
to charge battery A.

CAPCOM Roger, Jim, copy.

SC Joe, I'm standing by to charge battery A.

CAPCOM Okay, Jim. Could you stand by on that. We
just as leave you not do it right at the moment.

SC Okay, we'll stand by.

CAPCOM Roge, and we'll give you the word when we're
ready for that.

SC I'll get the radiation report here, shortly,
and to reconfirm, the position that H2 fan 3 should be
in.

CAPCOM Roge, Jim. And the H2 fan 3 should
be Auto.

SC Roger, I'll copy auto.

CAPCOM Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/27/71, GET 2534, CDT 1009, 75/1

CAPCOM Jim, this is Houston.
SC Go ahead, Joe.
CAPCOM Roger, Jim. Just for your own information here let me read up to you the CSM consumables that we've generated from the ground.
SC Okay.
CAPCOM Okay, at GET 25 09 we had RCS total 90 Quad A, 89 91 89 91. H2 tank 1 94 percent, 92 percent, 81 percent. 02 tank 1, 91 percent, 92 percent, 97 percent. So it agrees pretty well with what you guys are reading.
SC Good. Except for the RCS quantity.
CAPCOM Roger. Okay, Joe on the left CM delta P is a plus .7.
CAPCOM Roger. Copy plus .7.
CAPCOM Endeavour this is Houston.
SC Go ahead Joe.
CAPCOM Jim, are all three people still there?
SC All here busy doing little things.
CAPCOM Okay, good. I've got some information for you when you want to listen here and it concerns a short, little short problem in the switch.
SC Okay, Joe we're all listening go ahead.
CAPCOM Roger guys. We're going to ask you to do a test burn on your SPS a little later, in fact, around 28-1/2 hours, depending upon the results of that we're going to go ahead and do the midcourse and it will be a normal midcourse if the burn test doesn't really come off and it'll be a trim midcourse of some kind if the test, in fact, does give us an SPS burn and I'll come up to you a little later on in the day with a set of procedures. There are a long list of them but you'll be able to use your launch checklist for most of them. However, the test burn will mean that we're going to change. We're going to update your flight plan with a large number of things a little later on about 10 minutes I'll be ready to send it to you. Is that clear so far? Over.
SC Yeah, that's fine, Joe. Can you give us a little run down on what you think the problem is?
CAPCOM Dave, when we get some better OMNI in a second I'll start talking about that. We're about to lose the COMM.
SC Okay.
CAPCOM Endeavour this is Houston.
SC Go ahead, Houston.
CAPCOM Roger, guys. First of all, Dick Gordon is over in the simulator right now running through this SPS burn procedure and as soon as he says that's okay we'll read that procedure up to you, I guess, if it's not too complicated. Dave, in regard to your last question, very briefly, and I'm sure you guys have been thinking a bit about

APOLLO 15 MISSION COMMENTARY, 7/27/71, GET2534, CDT 1009, 75/2

CAPCOM this yourselves, we're interested in finding
out where in your Delta V thrust A switch the short seems to be
and all of us down here are convinced that it's either in
that switch or physically very near that switch. It's im-
portant that we know where it is because I guess the worst
that it -

END OF TAPE

CAPCOM It's important that we know where it is because I guess the worse that it could be would be a hard short, so call hard short up stream of the control pilot valve solenoid on bank A, and that would mean that we would lose the ability to turn bank A on and off as we wanted to. There are many other things that it could be, namely a soft short either up stream or down stream from that pilot valve solenoid. I guess it could be a hard short down stream from the solenoid which all of these would be annoying to us, but no major problem really. (garble)

SC Okay, I'll get the general -

CAPCOM Go ahead Dave.

CAPCOM We get the general, yea, we get the general gist of that Joe, go ahead.

CAPCOM Okay, Dave. What we are going to try to do now is to go ahead and do an SPS burn using bank A, and we want that short to be active when we do it. So at some point we are going to ask you to tap on the panel and try to get the short back for us. We show that the light is currently out and I'm sure that you will confirm that.

SC That's verified.

CAPCOM Rog. Assuming we can not get the light on again, we think that is unlikely, but if we can't get it on again, we'll delete this particular test and go ahead and do a midcourse, normal midcourse 2 burn, and while we scratch our heads on this other thing.

SC Okay.

CAPCOM Now, Dave, we've got the changes to the flight plan here if your recording secretary is standing by to copy it.

SC Okay, go ahead.

SC I'm ready Joe.

CAPCOM Rog Dave, are you just going to mark up the flight plan as I read it to you.

SC I prefer to do it that way.

CAPCOM Rog, I think that would be the easiest, and Jim are you copying this now.

SC I'm standing by Joe.

CAPCOM Rog, okay. Okay, we're going to start at 25 05, and we've already deleted the charge matt A line. Then moving on to 26 50, add T52 IMU realine option 3. Moving to 27 -

SC Copy.

CAPCOM Okay. Moving to 27 55, move Delta V test and no bias check up to 27 00. In other words just move that line up. And coming up to 28 00, a little something for you Al. We're going to delete the crew exercise period. And at 28 00, add in midcourse column MCC Houston column uplink to CSM, CSM state vector and Verb 66, update to CSM SPS test maneuver pad. And at 28 05, H2 purge line heaters on.

APOLLO 15 MISSION COMMENTARY 7/27/71 GET25:45 CDT1019 76/2

CAPCOM Exit G and N PTC and maneuver to add burn attitude.
Have you copied so far?

SC Yea, I think I've copied everything, the MCCH
column, understand the H2 PURGE line heaters on, at the PTC
manuever the pad burn attitude at 28, over.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/27/71, 25:50 GET, 10:24 CDT, 77/1

SC the maneuver to pad burn attitude at 28:05.
CAPCOM Roger, Jim, and we're going to lose comm in
a minute; I'll be back with you.
SC Okay.
CAPCOM Okay, Jim, this is Houston and the comm's
back again. How do you read me?
SC Loud and clear.
CAPCOM Okay. I'm ready to continue. And we'll
pick up at 28:15 with a sextant star check.
SC Okay.
CAPCOM Okay. 28:20 I'm going to read to you seven
lines of instructions here, and they're all reproduced two
pages over in your flight plan at 30:30. Your choice as to
whether you want to copy them or just look two pages ahead.
I'll go ahead and read the flight plan.
SC Why don't we just look two pages ahead.
CAPCOM Okay.
SC Go ahead.
CAPCOM Okay. We're going - I want you to move
seven of the lines from 30:30 to 28:20. And those sevens
lines are: The SIM sector 1 SM/AC power ON; pan camera power
BOOST; map camera image motion OFF; map camera ON; Stand by.
H2 and O2 fuel cell purge; waste water dump; and at 28:35
H2 purge line heaters OFF.
SC Okay, I'll move those - there are six steps
there.
CAPCOM Okay.
SC - - at 28:20.
CAPCOM Roger, Jim. That's right. And the seventh
step was at 28:35; you're correct and that brings us to 28:40.
which is SPS burn test and at 28:41, verb 66 set CSM state
vector into LM state vector.
SC Okay. Copied. SPS burn, verb 66.
CAPCOM Rog. 30:13 delete, in fact all the other
items from here on out are deletes. And I'll go through
them quickly. 30:13 delete battery charge A termination;
30:15 delete H2 purge line heaters ON; 30:18 delete exit
G&N PTC; 30:23 delete if SPS MCC required and the
references to pan and mapping cameras; the things, in fact,
that you moved ahead; 30:35 delete H2 and O2 fuel cell purge
and waste water dump; and - -

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/27/71 GET 25:56 CDT 10:30 78/1

CAPCOM and waste water dump and finally 3050, delete.
H2 purge line heaters OFF. Over.

SC Okay. I copied all that Joe.

CAPCOM Okay Guys. That's all we've got for you for the moment. Dick walked into the MOCR a few minutes ago. He says that the test burn procedure went okay. We're going to look it over 1 last time and then read the procedures to you.

SC Okay.

SC Houston, 15. We're ready to cycle the film in the scan and mapping cameras.

CAPCOM Endeavour, we're ready when we get the high gain going here. And I guess we'll have that ready in about 5 minutes.

SC Okay.

CAPCOM Endeavour, this is Houston with your high gain antenna angles update.

SC Go ahead, Joe.

CAPCOM Roger. For the high gain PITCH minus 25
YAW 90.

SC Okay, that's 25 and 90.

CAPCOM Roger and OMNI react MBW.

SC Roger.

CAPCOM And that is just for your information.

CAPCOM Jim, if you'll go ahead and set the angles in, we'll give you the cue when we're ready for you to select the high gain.

SC Okay.

CAPCOM And it looks like it will be about 10 minutes
I guess.

SC Roger.

CAPCOM Endeavour, this is Houston.

SC Go ahead.

CAPCOM Roger, Guys. I wondered if you were interested in any breakfast time news up there?

SC Yes sir, we always are.

CAPCOM Is it breakfast time?

SC Right, just about.

CAPCOM Okay troops. Let me start with a special message of God Speed to the crew of Apollo 15 from President Richard Nixon. And I'll quote directly from him. And there are some words in here that are very well expressed, I think. "Apollo 15 is safely on its way to the moon, and man is on his way to another step across the threshold of the heavens. Man has always viewed the heavens with humility, but he has viewed them as well with curiosity and with courage, in these, defied natural law. Drawing man beyond gravity, beyond his fears and into his dream and on to his destiny (garble)

END OF TAPE

CAPCOM Endeavour select the hydrogen purge, please.
CAPCOM Okay, guys, suddenly you're back loud and clear, how do you read, Houston?
SC Okay, we're (garble)
CAPCOM Endeavour, this is Houston, how do you read?
CAPCOM Apollo 15, this is Houston, over.
CAPCOM Hello, Endeavour, this is Houston, over.
SC Go ahead.
CAPCOM Rog, Jim. Sorry for the interruption there. We had severe noise on our com momentarily but it's cleared up now. I'll go ahead with the morning's news and a quote from President Nixon. "The flight of Apollo 15 is the most ambitious exploration yet undertaken in space. Even as it reflects man's restless quest for his future. So, it also reenacts another of the deeper rituals of his bones, not only the compulsion of the inner spirit to know where we are going but the primal need in man's blood to know from what we have come. We hope by this journey to know better the origins of Earth, the moon and other planets. We hope to understand something more of the mysteries of God's great work. And in this seeking, we hope to understand more of man himself. To the men of Apollo 15, for all men, I say God speed." End quote. And there's a second message here that was telephoned to Doctor Fletcher yesterday through the State Department. It reads "Congratulations on flawless launch. Please pass my best wishes for a successful mission to the crew of Apollo 15 and to your entire staff." And that message is signed "Spiro T. Agnew". And the third comment about the launch was the launch is called flawless and you three are described as being very businesslike. And Kathy is quoted as saying quote "The mission was the most nominal launch we have ever had." Unquote. And I'd like an editor's note here, that's probably technically correct but it is aesthetically very incorrect. You could track the vehicle for hundreds of miles, literally, hundreds of miles through beautiful clear sky, and it was a sensational launch aesthetically. I suspect you -- I'm sure you will agree with that. Let's see. We've got an item here on Muhammad Ali/Jimmy Ellis fight here in the Astrodome and it was declared a technical knockout in favor of Muhammad Ali in the last round - the 12 round. And it says that Ali took control of the fight in the sixth round and signaled the start of the end with an upper cut midway through the final round. And continuing on with the news,

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/27/71, 26:16 GET, 10:56 CDT, 80/1

CAPCOM - - and continuing on with the news, if you're still reading. Western Union employees - -

SC Rog, Jom.

CAPCOM Okay. Western Union employees have announced agreement on a new contract that will end a nationwide walk-out that began June 1. The 17 000 striking workers will go back on the job Wednesday morning. The Lockheed Company lost two senate vote loads today in its attempt to avoid bankruptcy by obtaining a 250 million dollar Government loan guarantee. In sporting news or further sporting news, the Oilers traded Jerry Levias to the San Diego Chargers in exchange for two linemen, defensive lineman Ron Billingsley, and the 300-pound Gene Ferguson. The Oilers will use Ferguson at offensive tackle, it says. And finally, the Minnesota Vikings lost the services of starting guard, Jim Balone when the doctors revealed that an undisclosed ailment would require long-term extensive treatment. And that's the end of the condensed news page I have in front of me this morning.

SC Okay. Thank you very much, Joe, and please express our appreciation to the President and the Vice-President.

CAPCOM Roger. Sure will.

SC Endeavour, Houston, go to auto track for us now please, and we're going to wait for another rev before we start to cycle those cameras.

SC Okay, Joe, auto track.

CAPCOM Endeavour, this is Houston, we'll be coming up on your camera cycling in about 15 minutes, just for your own planning, and we'll cue you when we're ready for that.

SC Roger. We read, Joe.

CAPCOM Endeavour, could you select your react mode, now for us please.

SC Okay. Going to react.

CAPCOM Roger.

CAPCOM Okay, Endeavour, this is Houston and we're ready for the camera cycling procedure now.

SC Stand by, Joe.

CAPCOM Roger.

CAPCOM 15, this is Houston. If we're going to complete the camera cycling on this rev, I guess we'd better get started on that.

SC Yeah, we're in the process, Joe.

CAPCOM Oh, okay.

SC Houston, 15.

CAPCOM Go ahead.

SC Okay, if you're reading all our good telemetry down there, Joe, we'll go ahead and cycle this thing.

CAPCOM Roger, Al, go ahead.

CAPCOM But stand - stand by. Sorry, stand by.

SC Okay.

CAPCOM We're not getting high-bit rate data yet.

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SC Okay, we'll stand by for your cue, then,
Joe.
CAPCOM Al, this is Houston. Is your data system
switch ON?
SC Rog, Joe. That's affirmed. It is.
CAPCOM Roger.
CAPCOM Apollo 15, Houston.
SC Go ahead Houston.
CAPCOM Guys we're having trouble picking up the
proper data so we can monitor the film cycling process here,
so we're going to have you stand by on that until our next
high gain acquisition, and we'll be back with you. In the
meantime, leave all the SIM bay in the present configuration,
if you would, please.
SC Roger.
CAPCOM Okay - -
SC Is there anything we can do to help, Joe?
CAPCOM Say again, Al.
SC Is there anything we can do to help?

END OF TAPE

capcom Al, this is Houston. We don't think that there is anything you can do to help us at the moment.

SC Roger, Joe.

CAPCOM Okay, and in the meantime, we'd like to talk about upcoming SPS burn and we're going to be reading procedures up to you in a moment and we think the easiest for you to copy these into your CSM launch checklist so you might be looking for that and getting that out,

SC Okay, Houston, I wonder if you could hold off for about 10 or 15 minutes and let's get through the breakfast chores here and then we can settle down and concentrate.

CAPCOM That would be fine, Dave. We'll be standing by for your call on that and there is no hurry.

SC Okay.

CAPCOM Apollo 15 select high gain close rate.

CAPCOM Endeavour, this is Houston.

SC Go ahead, Joe.

CAPCOM Roger stop PTC mode for us now, please.

SC Roger, standby.

CAPCOM Apollo 15, Houston.

SC Go ahead, Joe.

CAPCOM Okay, guys could you tell us how far down in your cycle film procedure you've proceeded - down to what step.

SC Joe, this is Al. We've got down to the point where we want to get you to cycle film.

CAPCOM Okay, Al, that's fine. We copy that and we suspected that but wanted to confirm it.

CAPCOM Al, this is Houston.

SC Go ahead, Joe.

CAPCOM Roger, Alfredo, could you verify two things for us please, that the map camera is in standby and that the pan camera power switch is ON and when you turned it on did you get the proper talk back indication?

SC The answer is affirmative in both of those Joe.

CAPCOM Okay, thank you.

CAPCOM Al, this is Houston with another request on this film cycle procedure.

SC Okay, Joe, go ahead.

CAPCOM Roger, Al, could you cycle the SMAC power switch for us OFF and then On, please.

SC Okay, I'll GARBLE do it.

CAPCOM Okay, our problem here we're seeing all the carriers but we don't get proper modulation so we're just not getting the right data.

END OF TAPE

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SC Okay, Joe, that's midcycles now.
CAPCOM Okay, Al, thank you.
CAPCOM Apollo 15, Houston.
SC Houston, 15, go ahead.
CAPCOM Rog guys. The attitude which you are currently holding is a good attitude for your P52 if one of you wants to get started on that. We will have some words for you on the SIM Bay problem in a few minutes and then we will want to be talking about the SPS burn coming up pretty shortly here. That is we want to talk about it shortly, it won't be coming up for a while.
SC Okay, Joe, I'll start doing the P52.
CAPCOM Okay.
CAPCOM Okay, Al, this is Houston again.
SC Yeah, Joe, go ahead.
CAPCOM Al, your choice here. We suddenly found the missing data. It mysteriously reappeared and we're ready to go ahead with your film cycling procedure. Your choice if you want to do your P52 first or the film cycle first and we're standing by for either.
SC We're all set up on the film cycle, Joe. Why don't we go ahead and do that and then I'll flip down and do P52.
CAPCOM Okay, Al that sounds good to us and we'll be watching. Okay, Al, film cycling's complete and it all looked very good to us and you can proceed on with the power down.
SC Okay, Joe. Thank you, sir. Okay, power down to the SIM Bay is complete Joe.
CAPCOM Okay, Jim.
PAO This is Apollo Control. 27 hours, 22 minutes ground elapsed time. Apollo 15 now 111 078 nautical miles out from earth. Velocity now 4977 feet per second. Crew just a few moments ago completed the cycling of the film transports and the panoramic and mapping cameras in the science instrumentation module or SIM Bay back in the service module. For a while there, no data was coming in to the control center to monitor this cycling but the - apparently the blockage was found somewhere in the network between Madrid station and Mission Control. And mysteriously the data started coming in. The crew was given a go to complete the test, here's air ground.
CAPCOM Come in Al.
SC Okay, Joe I've got gyro torquing angles up and I'll torque them out on the minute. That'll be at 27 hours and 24 minutes.
CAPCOM Okay, Al.
PAO At any rate the camera tests shown on page 3-28 of the Apollo 15 Flight Plan were completed satisfactorily and the crew is presently doing a P52 realinement program 52

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PAO realinement of the inertial measurement unit. Earlier the midcourse 2 correction burn time was shown on displays here in the control center as being at 22 or 28 hours, 30 minutes. The Flight Dynamics Officer has subsequently shifted the time to ten minutes later at 28 hours, 40 minutes. Duration of the burn is less than 1 second, .85 seconds to be precise. In this burn it's hoped to determine what the nature of the problem is with the Delta V light that comes on in the EMS or entry monitor system panel in the spacecraft. Some procedures will be read up to the crew by Dick Gordon who is standing by at the CAPCOM's console. Gordon earlier today ran through these procedures in the Houston command module simulator in the crew training building. If the engine in these -

END OF TAPE

PAO If the engine in these procedures, it says, quote: if the engine does not start within about 3 seconds, open SPS pilot valves A

CAPCOM Guys, we just had indication that your thrust light came on again for about 10 seconds, did you notice that?

SC Yeah, rog, Joe, that was the EMS Delta V check.

CAPCOM Okay, Dave. Thank you. And Guys, we'd like to ask that you locate your CSM launch checklist because we want to start talking about this SPS burn procedure.

SC Okay, we'll be ready in a couple of minutes.

PAO At any rate, if the engine does not start within 3 seconds, it indicates that the short is upstream of the service propulsion system pilot solenoid valves. If the engine does start, the short is downstream of the same pilot solenoids. At any rate all of this should be made fairly clear in the discussion upcoming between Dick Gordon and the crew of Apollo 15. And at 27 hours 26 minutes, we're up live on the air/ground. This is Apollo Control.

SC Okay, we've got the checklist, now, and we're ready to listen.

CAPCOM Okay, Dave, if you would please, turn to page L4-14 and we're just going to ask you to copy the procedure onto that page because it will consist of just a few changes to what's already listed on those few pages there.

SC We've got L4-14. Go ahead.

CAPCOM Okay. Unless you'd like an explanation of what's to come, I'll go ahead and read through the steps here and pause from time to time to make sure that you're getting it all and then we can talk about the details of why it's breaking out like this when we finish it.

SC Okay. Go.

CAPCOM Okay. Rog. I'm going to start there at the line: if time permits, go to G&N thrusting procedures, etc. and right underneath that short paragraph write in: circuit breakers EPS group 52 CLOSE and that's a verify.

SC Okay, circuit breakers EPS group 5 to CLOSE. That's the main A and main B, right?

CAPCOM Yes sir. And then we'll go on down about 4 lines to the Set Delta V and that should read: Set Delta VC minus 100.

SC Rog. Set Delta VC minus 100.

CAPCOM Rog. Now into the TVC check and prep section, after the first line which is: circuit breaker STAB control system on CLOSE, insert: Circuit breakers SPS pilot valves 2 OPEN and that's a verify.

SC Okay. Circuit - Okay, circuit breaker SPS pilot valves 2 OPEN verify. Below the line it has CB's to boating control system all CLOSE.

CAPCOM That's correct, Dave. And the next line

APOLLO 15 MISSION COMMENTARY, 7/27/71, 27:25 GET, 11:56 CDT, 83/2

CAPCOM should read: circuit breakers SPS 10 CLOSE.
SC Okay, understand; that's 10 CLOSED.
CAPCOM Rog. Skipping down several lines Delta V CG
LM/CSM.
SC Rog. Delta V CG LM/CSM.
CAPCOM Okay, Dave, turn to page 415.
SC Page 415.
CAPCOM Rog, and your next change is in the TVC check;
third line from the bottom of that first group there delete
rate high.
SC Okay, secondary TVC check third line from
the bottom, delete rate high. That's the line right after
limit cycle off.
CAPCOM That's correct. Down into the next group.

END OF TAPE

SC millacycle off.

CAPCOM That's correct. Down into the next group:
Delta V thrust A to normal, You can -

SC Delta V thrust A to normal and delete B.

CAPCOM That's affirm and then insert right after
that - immediately after that, the following note: Get
thrust light on by pushing on panel first.

SC Okay. In other words, you want us to try
and get the SPS thrust light on by tapping on the panel
some way so that the light is on with the Delta V thrust
A switch up to normal. Is that right?

CAPCOM Dave, that's not quite right. Let me read
through it. We want you to get the light on, but we want
you to try first to get it on just by pushing, by flexing
the panel around the switch in question. And the reason
we're doing that, we think - it's - the probable short
is contamination in the switch, but there's a small chance
that it's some sort of problem in the wire bundle that
will be flexed very slightly when you just push on the
panel. So that the note should read the following, and
I'll read it clear through to the end. Get thrust light on
by pushing on panel first. If this doesn't work, rap on
panel or cycle the switch until the light comes on. And
if the light doesn't come on, we're going to delete the
test.

SC Okay, why don't we try that right now?

CAPCOM Dave, stand by a second.

SC Okay.

CAPCOM Dave, let's ask you to stand by on that.
We'd prefer to complete reading the procedures to you
and then we'll worry about this light business. At any
rate, you should have inserted the note: Get thrust light on
by pushing on panel first. If this doesn't work, rap on
panel or cycle the switch and if no light, then delete
the test.

SC Okay, understand. Push, rap, cycle and
if no light, delete the test.

CAPCOM Beautiful. Okay, now at about 1 minute
to GO, but definitely after the light is on, proceed on
to the next step, which is verb 37 ENTER, 47 ENTER.

SC Okay, get the light on and then we're at
2 minutes and we're work for about a minute to try and
get the light on. And if we don't get it on by 1 minute
then we will consider that we cannot get it on and if
we do get it on by 1 minute we'll call up P47.

CAPCOM Dave, it's - I guess the 2 minute mark
out to the side of your checklist there is meaningless
in this case because the test is in no way time critical.
We want you to take your own time and work to get the
light on, but if it does come on at about 1 minute
before the burn, we'll want you to go into program 47.

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SC Okay, I'm with you. Just to make sure we have P 47 running.

CAPCOM Roger. That's exactly it. Okay, that brings us down to our next change, which is an insert just below the line EMS mode normal. And the change is ON misfin Q, circuit breaker SPS pilot valve A CLOSED. And a note that goes with this line: 1 second burn desired if no ignition. Circuit breaker SPS pilot valve A OPEN after 3 seconds.

SC Okay, understand. Just before EMS mode normal, on MSFN Q, cb SPS pilot valve CLOSED. A desire 1 second burn, which means that if we can light we'll

END OF TAPE

SC Which means that if we get a light we open the circuit breaker after 1 second. If we have no light, you want to leave the circuit breaker closed for 3 seconds and then open it.

CAPCOM That's exactly right Dave. Now I've got some words here from Dick Gordon who's run through the procedure this morning and he tells me that, that a good cue to monitor is the SPS PC coming off the PEG, and at the same time Jim or Al can, or whoever is there, and watch the ball valve indicator also for a cue that the engine is starting to burn.

SC Okay, stand by one Joe, let us regroup here for a minute and make sure that we have no questions up to this point.

CAPCOM Okay.

SC Okay Joe, I guess one question we wanted to make sure here was that the, on the MSFN cue to close the pilot valve is prior to going to EMS mode normal. In other words we'll never get the EMS -

CAPCOM Negative.

SC That correct?

CAPCOM Dave, that's negative. EMS mode normal -

SC Okay.

CAPCOM And then on MSFN cue the SPS pilot valve A Alpha closed and let me repeat here Dave, you may or may not get a light at this particular point. If you do not get a light, open the circuit breaker after about 3 seconds. If you do get a light, we are interested in as short a burn as you can give us, so, and Dick tells me that the reaction time, a good reasonable reaction time would be in pulling the circuit breaker after you see the PC come off the peg. It would give you about 3 to 4 feet per second. And that's a real good number for us as far the midcourse 2 is concerned.

SC Okay, that's why we asked the question, just to make sure. It makes more sense the way you're doing it. So I guess we understand that. Al watching the PC gage and Jim can watch the ball valves and if anybody sees something move, why Al can pull that circuit breaker.

SC Okay, Dave. That sounds good. Now a word about the circuit breaker, you might want to cycle it a couple of times, but before we go through this just to make sure its not alot stiffer than what you use to working with in the simulator, and just get some idea of how its best to position yourself to pull it. It's also not all that critical that it get pulled absolutely immediately, but you know whatever is comfortable to do. It might make it easier for us on trimming up with you midcourse if we do get a burn.

SC Okay, I will.

CAPCOM And before you test that particular circuit breaker just make sure that the group 5 circuit breakers are

CAPCOM open and we won't be risking anything by testing it. Now finally after this note, we've got several deletions and I'll continue on here. Delete ullage and thrust on, delete SPS thrust light on, delete Delta V thrust B, delete ullage and thrust on, delete monitor thrusting PC 95 105 EMS counting down.

SC Okay, we've got that. Deleting the next 7 lines.

CAPCOM Yes sir exactly. Now the next line should read SPS injection valves to open.

SC Adjust SPS injection valves to open.

CAPCOM Roger. Three lines down delete plugs balanced.

SC Rog, delete plugs balanced.

CAPCOM And then, the next line at

END OF TAPE

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CAPCOM The next line after ignition confirmed circuit breaker SPS pilot valve A MAIN A OPEN.

SC Okay, after ignition confirmed CB SPS pilot valve a MAIN A OPEN. That's about what you would use in the notes.

CAPCOM roger, exactly. And then a note well, let's see the note is just to rehash at what we've already told you. The burn should not exceed 1 second if it's possible to avoid it, and then EXIT P47 immediately after burn.

SC Okay, shouldn't exceed 1 second in Exit P47 immediately after the burn.

CAPCOM Roger and that takes us to page 416. The first line.

SC Page 416.

CAPCOM Roger. The first line - Delta V thrust A OFF.

SC DELTA-V thrust A OFF.

CAPCOM Okay, Dave and that's really the end of the procedures. We have another note for this page which is after test if SPS light goes out attempt to get lights back on by your standard procedures, pushing, rapping and cycling I guess.

SC Okay, after the tests if the SPS light is out attempt to get it back on.

CAPCOM Roger and that completes the procedures. Maybe a couple of more words about it here. It's also possible that when you push the circuit breaker to the pilot valve A in that the light will just go out, in which case, we'd be pretty confident that the contamination causing the short is just a burn through. In other words, just disappeared and is no longer shorting the switch. The light would go out and otherwise nothing else would happen.

SC Okay, understand. If we instantly push the circuit breaker in and the light goes out we have burned too short, okay.

CAPCOM And guys, you might look through those again and if you have any questions please come right back to us with them.

SC Okay, let us mull it over and we'll be back with you.

CAPCOM Okay.

SC Okay, Joe we have no further questions. We think we can run through that one okay.

CAPCOM Okay, Dave and we'll have a pad for you in a few minutes.

SC Okay, and I guess I still have a question as why we don't take a look at that light now with the push, rap and cycle technique.

CAPCOM Let me get a reading on that.

SC Okay, you know we've tapped it, cycled it but

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SC we've never pushed that panel just by pushing the panel to see if the light will come on.

CAPCOM Dave, I guess the main reason is before you do it we'd like to get some recorders configured. We're setting the recorders up now so we can monitor the problem as you go through it and then there is no reason you can't try pushing on the panel provided the pilot valve breaker is in the group 5 breakers are pulled.

SC Well Joe will you get a chance or when you are set up down there - why don't we try that and at the same time we can run through our little check to see how the pilot valve MAIN A circuit breaker works cycling.

CAPCOM Okay, Dave. That sounds good.

SC We'll standby for your call.

CAPCOM Endeavour this is Houston requesting P00 and ACCEPT and we'll give you a state vector and some drift terms.

SC You've got it P00 and ACCEPT.

CAPCOM Thank you.

END OF TAPE

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CAPCOM Endeavour, this is Houston.
SC Houston, Endeavour, go.
CAPCOM Rog. Dave, after you verify for us that your pilot valve circuit breakers and group 5 circuit breakers are out, you can go ahead with push RAP cycle test if you like.
SC Okay. Okay. Group 5 are open and the pilot valves are open and we'll take a look at it.
SC Okay, Houston, nothing like pushing your own (garble).
CAPCOM Okay, Dave, we agree.
SC Okay, I'm on with the RAP up just to the top of the switch. Okay, I'll cycle it and see if goes off. It flickers as I pass through neutral.
CAPCOM Roger.
SC And out.
CAPCOM Dave, as long as you keep those circuit breakers out, there's no reason we can't leave that light on. We need it on for the test anyway.
SC Okay, Joe, I can find the position of the switch where I can turn the light out now; in neutral position on the switch if you want to look at it. I've cycled the switch a number of times and I think I've got it to the spot where the light will go off, and I'll turn it off for a couple of seconds here for you.
CAPCOM Okay, Dave, go ahead and we'll watch in the drivers at the same time.
SC Okay, Joe, the light's out right now. Dave's holding the switch.
CAPCOM Rog. We confirm that.
SC Okay, it's coming back on now.
CAPCOM Rog.
SC It's going off now.
CAPCOM Rog.
SC And it's coming back on.
SC And it seems like it goes off just at the lower portion or near the off portion of the force range there when you get to neutral; as you go into the neutral position, you have high forces and right at the beginning of those high forces, it will go off, and if you hold it in the neutral position, or the mid position where the force of the bottom of the switch holding it so it won't go over center, that's when the light will go off. As soon as you let it go over center and flick up to the top, the light comes back on.
CAPCOM Roger. Dave, we copy that. Dave let's go ahead and stay in this configuration. If you want to practice with the pilot valve circuit breaker, we emphasize that group 5 circuit breaker definitely should be open.
SC Okay, we'll do that now.

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SC And the circuit group 5 are open.
CAPCOM And, Endeavour, this is Houston with the
maneuver pad when you're ready to copy.
SC Okay, Joe, I'm ready to copy.
CAPCOM Okay, Jim, and it's your computer.
SC Okay.
CAPCOM Maneuver pad for the SPS test SPS/SCS NA plus
124 minus 011 028 40 0000 NA NA NA; roll 061 018 020 NA NA
NA NA NA 11 2161 186 NA NA NA: NA all the rest of the way;
GDC aline Vega Deneb; roll aline 209 009 349; other comments
set up sps gimbal front wheels with pitch trim yaw trim;
high gain antenna

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/27/71 GET 27:59 CDT 12:34 88/1

CAPCOM YAW trim. High gain antenna, PITCH minus 25, YAW 359. Over.

SC Okay. Read back on the SPS SCS plus 124 minus 011 028400000061 018 020 112161 186. Vega and Deneb 209009349 and SPS front wheels to the PITCH and YAW trim. High gain antenna is PITCH minus 25 and YAW 359.

CAPCOM Rog. Readback correct.

CAPCOM Endeavour, this is Houston.

SC Houston, 15. Go ahead, Joe.

CAPCOM Al, just a couple more words here. We're quite interested in subtle changes that may take place in the thrust light. And we'd like for you to think about perhaps playing around with the cabin lighting control there so you can get a good view of the light and you may or may not want to use the filter in front of the light as you watch it and I guess the third one of you should be watching the light during the burn test.

SC Okay, Joe. We'll keep a close eye on the light.

CAPCOM Roger, Al. You understand that it's not a question of ON-OFF, but also if the intensity changes and -

SC Yes, affirmative, Joe.

CAPCOM Rog. Okay. And guys, you can go ahead with the waste water dump if you want to now. There's nothing magic about the time we gave you on that.

SC Okay, Joe. Thank you.

CAPCOM Rog. And the provision on that is that you be at burn attitude before you dump the water. And after the sextant star check.

CAPCOM Apollo 15, this is Houston requesting beam-width to wide.

SC Okay, we're wide, Joe.

PAO This is Apollo Control at 28 hours 18 minutes ground elapsed time and some 21 minutes 22 seconds until hopefully ignition on the SPS test, which will be a midcourse correction number 2. Ignition time set for 28 hours 40 minutes ground elapsed time. Very little communications in the past 20 or 30 minutes from the crew of Apollo 15. Getting prepared for the service propulsion system burn. It barely rates as a burn - such short duration of less than a second. Continuing to stay up live on the Apollo 15 air-ground circuit, this is Apollo Control.

END OF TAPE

PAO up on the Apollo 15 air ground circuit
this is Apollo Control.

CAPCOM 15, you can terminate the waste dump anytime.

SC I was doing that now.

CAPCOM Okay guys and just want to reemphasize
another point here, this burn is not at all time critical.
It has very little effect on our midcourse corrections later
on or whatever, just want you to understand that.

SC Okay, Joe, we understand that.

CAPCOM Okay, Endeavour this is Houston. And we're
showing about 4 minutes to ignition.

SC Okay, and we've got about 5 and we're proceeding
through the checklist.

CAPCOM Sounds good.

SC Houston, 15.

CAPCOM Go ahead.

SC Okay, Joe we're all set up ready to go. We've
got about 50 seconds to go. Sorry Joe, there we are - yeah
we're ready to go now any time on your cue.

CAPCOM Okay, guys, go ahead.

SC Okay, Joe. Ready. Mark about 5.3 on the
DSKY and about 4.7 on the MS.

CAPCOM That sounds beautiful troops.

SC And Houston, the light is still on.

CAPCOM Roger, Dave. We confirm that.

CAPCOM Endeavour, this is Houston.

SC Okay, go ahead.

CAPCOM Roger guys. When you are comfortably through
with the procedure here we'd like for you to turn the thrust light
out for us please by pulling the EMS MAIN A and B circuit
breakers, two of them on panel 8.

SC Roger, they are both open, the light is out.

CAPCOM Okay Dave and that - the reason for that is
just to conserve that light bulb and a little power and that
burn was exactly what we wanted to see. We'll proceed with
a normal mission.

SC Ah, that's nice to hear.

CAPCOM I'm a smooth talker aren't I?

SC Well, I'm glad you guys down there can figure
all this out.

CAPCOM And guys further word here, as you are probably
already aware, the short is in what we've been calling the
downstream side of that driver solenoid and it means only
that it's a little bit annoying to have. We can still turn
bank A on and off as we want. We might modify a few procedures
a little bit, but we haven't lost that bank.

SC Okay, very good. Thank you, Joe. Let's
go to Happy.

CAPCOM That's a super idea.

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PAO This is Apollo Control. The test of the service propulsion system apparently a success. Commander Dave Scott's comment was let's go to happy. At the time of the burn -

END OF TAPE

PAO Commander Dave Scott's comment was, let's go happy. At the time of the burn which in actual time was ground elapsed of 28 hours 41 minutes. Spacecraft was traveling at 4 845 feet per second at a distance out from earth of 114 787 nautical miles.

CAPCOM Hello Endeavour, this is Houston.

SC Rog, Houston (garble) okay.

CAPCOM Rog Dave. We're requesting narrow beam width and then we have an attitude we'd like you to maneuver to for, for a DSE dump which we will initiate. Specifically roll 40 pitch 12 yaw 50. High gain minus 38 and 318, over.

SC Okay, understand. High gain is now in narrow, maneuver to roll 40 pitch 12 yaw 50. High gain is minus 38 and 318.

CAPCOM Rog, Dave, and after that we'll need only a roll maneuver to get us into this sextant photo test attitude.

SC Okay, very good.

CAPCOM Apollo 15, Houston.

SC Houston, 15 go.

CAPCOM Roger Dave. I'm pleased to report that not only did you carry out a successful SPS test burn but you did a superb midcourse 2 correction at the same time. In fact you burned it to within a half a foot per second of being exactly what we wanted. Consequently we're going to omit midcourse 2 and midcourse 3. We'll be looking at a midcourse 4 correction of around 6 feet per second it looks like now. And additionally because of this we'd like for you to go ahead and secure the mapping camera and the pan camera at your convenience for the procedure that's shown at 31 hours and 10 minutes. Over.

SC Okay, Joe. Well we sort of had that in mind when we ran the burn, and we'll secure the map and pan, and we'll be standing by for midcourse 4.

CAPCOM Rog Dave. Al Worden always did have a very fine touch on the circuit breakers.

SC Yes sir, we call him nimble finger up here.

CAPCOM Rog, no comment to that one.

SC Okay.

CAPCOM Endeavour, Houston.

SC Go Houston, Endeavour.

CAPCOM Roger. Al for your benefit we scrubbed the crew exercise period earlier. We'd like to put that back in again anytime between now and the sextant photo test.

SC Okay Joe. Jim and I are doing some house keeping now, and we're going to make sure we get all the exercise periods for you.

CAPCOM Roger Dave. All will rely on you for that.

SC Gee, we might even do a couple extra.

APOLLO 15 MISSION COMMENTARY, 7/27/71, 29:04 GET, 13:38 CDT, 91/1

CAPCOM Endeavour, this is Houston. Please start your battery A charge at your convenience.

SC Okay, starting battery A charge.

CAPCOM Okay, Dave, and we do have one question regarding the burn. On our data down here, we saw the thrust light go off right after the burn or about 7 seconds, and wondered if you noticed the same thing up there?

SC Stand by.

SC Houston, the consensus here is that it stayed on and I guess we might have missed a short period there in getting the engine off and getting out a P-47, but Al and I both feel like it stayed on all the way, but I guess we're not a hundred percent sure of that.

CAPCOM Okay, Dave, we copied. Thank you.

SC Okay.

PAO This is Apollo Control 29 hours 32 minutes ground elapsed time. Very little conversation in the past hour with the crew of Apollo 15. Distance from Earth: 117 211 nautical miles; velocity continuing to decrease now 4763 feet per second. Fairly quiet in the missions operation control room at the present time. All the extra people have broken out for lunch. People that were in here for the test of the service propulsion system, which sufficed quite well as a midcourse correction burn number 2; so well, in fact, that the scheduled midcourse correction burn number 2 and number 3 have been scrubbed as of now. And we're looking toward a midcourse correction number 4 of somewhere in the neighborhood of 6 feet per second. The actual velocity change on the test was 5.3 feet per second; we don't have an exact burn time yet. That will come off the dump data, which has not come into the center yet. At the time of the burn, spacecraft was 114 787 miles out from Earth - nautical miles out from Earth. Continuing to stand by on the air/ground loop, this is Apollo Control at 29 hours 34 minutes ground elapsed time.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/27/71 GET 29:36 CDT 14:11 92/1

SC Houston, Apollo 15.
CAPCOM Go ahead, 15.
SC Would you like the P52 at 30 hours.
CAPCOM Say that again, Dave, I didn't copy.
SC Would you like the P52 at 30 hours or would
you like to bypass it?
CAPCOM Dave, that's not required. Go ahead and
bypass that please.
SC Okay, thank you.
CAPCOM Dave, this is Houston again. While we're
talking, could you look back in your timeline for us, please
and give us the results of your EMS test, I guess that's a
bias reading at around 27 hours.
SC Roger. That was .7.
CAPCOM Okay, .7. Thank you.
SC The Delta V test was okay.
CAPCOM Roger.
CAPCOM 15, this is Houston.
SC Houston, 15.
CAPCOM Roger, Al, I've got a correction to the erasable
loads in your G&C checklist. If you'd fish that out for me,
I'll go ahead and read them to you.
SC Okay Joe. Could you stand by about 5 minutes?
CAPCOM Roger, Dave. Standby. No hurry. Just give
me the word.
SC Houston, 15. If you could standby about 5 min-
utes while (garble) we're finishing this exercise period then
we'll get with you on that.
CAPCOM Roger. I'll stand by 10 or 15 minutes in
that case.
CAPCOM 15, Houston.
SC Houston, 15.
CAPCOM Dave, in all that going on with that flight
plan activity for about 28 hours, we may have missed something.
Did you change your lithium hydroxide canister about 28 hours
or so?
SC Rog, we got that.
CAPCOM Okay.
SC Houston, 15. The canister was changed about
26 10.
CAPCOM Okay, Dave. We're just seeing a little rise
in partial pressure CO2; that's the reason we asked the question.
We'll watch it.
SC Roger.
SC Houston, 15.
CAPCOM Go ahead, 15.
SC Roger, Joe. I'm ready with the erasable
update if you want to go over that.

APOLLO 15 MISSION COMMENTARY 7/27/71 GET 29:36 CDT 14:11 92/2

CAPCOM Roger, Al. Turn to page 9-4 if you would.
And it's an update only to your column alpha, octal id
column alpha. And it's octal id.

SC Okay, I got it.

CAPCOM Rog. Octal id 11 should read 00634, 12 is
77425 and 13 77317. Over.

SC Roger, Joe. Understand. Column alpha
octal id 11 should read 00634, 12 should be 77405 and 13
should be 77317

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/27/71 GET 30:10 CDT 14:44 93/1

SC 00634 12 should be 77405 and 13 should be 77317.
CAPCOM Al, there's a mistake in your read back for
12. That should be 77425.
SC Roger, Joe, 77425.
CAPCOM Rog.
CAPCOM And that's 610 of it, thank you.
SC Okay, Joe.
CAPCOM 15, Houston.
SC Houston, 15. Go ahead.
CAPCOM Rog, Guys. We're requesting that at your
convenience your roll to the sextant photo attitude which is
a roll of 270 the same pitch and YAW your presently in. So
that you'll be getting some sunlight on the SIM BETA to start
to warm it up. And during the roll we'll call out an antenna
change to you.
SC Okay, Houston. 15 understand you want us to
roll with our present PITCH and YAW to a roll of 270.
CAPCOM That's affirm, Al.
PAO This is Apollo control 30 hours 44 minutes
ground elapsed time. To repeat in view of the success of the
service propulsion system test back at 28 hours 40 - 40 minutes
30 seconds. The scheduled mid course correction number 2
shown in the flight plan at 30 hours 55 minutes some 11 min-
utes from now, will not be done. Nor will mid course correc-
tion number 3 be performed. Mid course correction number 4
right now, looks like it might be in the neighborhood of some
6 feet per second. Apollo 15 is now 120 487 nautical miles
out from earth. Approaching the moon at a velocity of
4 656 feet per second. At 30 hours 45 minutes ground elapsed
time live on Apollo 15 air ground. This is Apollo control.
CAPCOM Apollo 15 select OMNI charlie and stow the
HIGH GAIN, please.
SC Rog, Joe. OMNI charlie and stow the HIGH GAIN.
CAPCOM Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/27/71 CST 15:23 GET 30:49 94/1

PAO This is Apollo Control at 31 hours 13 minutes ground elapsed time. Shift hand over under way here in the control center. Milton Wendler's maroon team of flight controllers taking over from Gerry Griffin. We're estimating change of shift briefing right at 4 0'Clock or a few minutes there after in the main auditorium at Manned Spacecraft Center. Meanwhile Apollo 15 is 121,800 nautical miles from earth, traveling at a velocity of 4,614 feet per second. Some 3 hours and 10 minutes at 28 hours 3 minutes and 14 seconds ground elapsed time the spacecraft was equidistant from the earth and the moon. At 113,040 nautical miles. Very little contact with the crew in the last hour or so. Their usual quiet selves. And at 31 hours 15 minutes ground elapsed time this is Apollo Control. This is Apollo Control again, some numbers now on the check of the service propulsion system back at 28 hours 40 minutes, 22.5 seconds actual ignition time. We've got a delta v or a velocity change of 5.3 seconds which was within a half a foot of the desired velocity for midcourse 2, which is not scheduled for another 2 hours after the SPS check. The burn time was 7/10ths of 1 second, which is fairly rapid reaction time when you consider it was a manual burn essentially. At any rate this unscheduled midcourse correction burn number 2 brought about by this test has resulted in midcourse 2 and midcourse 3 being cancelled, and the flight dynamics officer is looking at a value of some 6 feet per second for midcourse burn number 4. At 31:17 ground elapsed time this Apollo Control.

END OF TAPE.

APOLLO 15 MISSION COMMENTARY 7/27/71 GET 32:18:00 CDT 1652 95/1

PAO This is Apollo Control at 32 hours 17 minutes. We accumulated 1 minute 18 seconds in air ground tape during the news conference. We'll play that back now.

CAPCOM 15, this is Houston. Go ahead.

SC You asked a question on the UV procedures.

CAPCOM Say again, which procedures. Your coming in very weak.

CAPCOM 15, this is Houston. Standing by for questions on UV procedures.

SC Okay, Karl. Maybe we can get an answer onboard. Stand by.

SC Houston, 15. I think we have an answer.

Thank you.

CAPCOM Roger.

SC Houston, 15.

CAPCOM 15, this is Houston. Go ahead.

SC Okay, when we make the photo test here, we have a call for a PCM cable, and the only ones we have onboard will not reach the connectors over by the right hand girth shell. Do you have any suggestions on how we can get the DAC connected to the PCM.

CAPCOM That's a good question. Stand by.

SC Okay.

PAO This is Apollo control. We're back live on air ground now. Apollo 15 is 124 660 nautical miles from earth. Velocity 4524 feet per second. At 32 hours 19 minutes. This is Mission Control, Houston.

CAPCOM 15, this is Houston.

SC Houston, 15.

CAPCOM I guess we have to agree with you that that cable doesn't reach all the way over to 227 and the request down here is that you voice record shutter opening and shutter closing on the S - on the DSE.

SC Okay, voice record shutter opening and shutter closing. We'll do that.

CAPCOM Thank you.

SC And meanwhile we also tried to get it to panel 162 without success. It was too short for that one, too.

CAPCOM Roger, we copy.

CAPCOM 15, Houston. We'd like to have OMNI DELTA, please.

SC Roger, OMNI DELTA.

SC Houston.

PAO This is Apollo control at 32 hours 51 minutes. It appears that the crew is running behind the flight plan approximately 15 minutes at the present time. Flight Director reports that they may be able to make this up prior to the scheduled TV time at 33 hours 45 minutes elapsed time.

APOLLO 15 MISSION COMMENTARY 7/27/71 GET 32:18:00 CDT 1652 95/2

PAO That's 06:19 central daylight time. However, we're unable to determine that at present, and the possibility does exist that the television transmission will begin late. Apollo 15 now 126 083 nautical miles from earth. Velocity 4480 feet per second. This is Mission Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/27/71 CST 17:25 GET 32:52 96/1

CAPCOM 15, This is Houston. We're anxious to know down here if you have checked the LM CM Delta P.

SC Not yet, Karl. We will though.

SC Okay, Houston, 15.

CAPCOM 15, This is Houston.

SC Okay, the LM CM Delta P is now +.8 and I guess there is no need to do the tunnel vent value, is there, at this stage, looks to us we can go ahead and bring the pressure back up, equalize the Delta P before we get into the tunnel.

CAPCOM Stand by. 15, This is Houston. We would like to go to a vent on the tunnel vent valve until the Delta P is greater than 2.7.

SC Okay, we'll do that.

CAPCOM Dave, we would like for you to tell us when the Delta P gets to 2.7 and stop there. The basic problem here is we want to dump the residual atmosphere out of the LM in order to put in good fresh oxygen before we have you climb in. We are sort of up against the time line now.

SC Okay.

CAPCOM Right-0.

SC Okay, (garble)

CAPCOM Good, okay. Don't . . don't go below 2.7 Delta P there.

SC Rog. Okay Houston we are at 2.7 Delta P on tunnel vent.

CAPCOM 15, This is Houston. Say again.

SC Roger, we are at 2.7 on the Delta P on the tunnel vent.

CAPCOM 15, This is Houston. The number that we need now, since the cabin went up, is we need a Delta P of 3.1. We have to vent the tunnel.

SC Okay, Delta P at 3.1. (garble)

CAPCOM 15, we'd like OMNI Bravo.

SC Rog, OMNI Bravo, and what was your last, after you said you wanted 3.1 on the left tunnel vent?

CAPCOM Stand by on that one. 15, This is Houston. To keep our records straight here, we are anxious for you to bring the tunnel down until we have a Delta P of 3.1.

SC Roger, Houston, that didn't work and we are up to 2.9.

CAPCOM 15, This is Houston. There's a couple of readouts we'd like to get when you have time. First of all, we'd like to get the PRD readouts for all three of you and we'd also like to have the magazine numbers used for the sextant photography and for the UV photography.

SC Okay, those are . . magazines are as per flight

APOLLO 15 MISSION COMMENTARY 7/27/71 CDT 17:25 GET 32:52 96/2

SC plan and we'll get you the PRD's when we can
get down into our suits, we'll get them before the day is out.

CAPCOM Okay, Dave, and incidentally, can you give
us any sort of report on that Number 5 window?

SC Looks clear.

CAPCOM We copy, thank you.

SC Okay, Houston, the Delta P is hanging
right in to about 2.9 to 3.0. I'd suggest we press on, huh?

capcom Stand by on that, Dave.

CAPCOM 15, This Houston. Time is not too critical,
we'd like to let it vent a little longer, try to get 3.1,
if we don't reach it in about 5 minutes, we'll probably
go ahead.

SC Okay, understand.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/27/71 3326 GET 1800 CDT MC97/1

SC Okay Houston, 15, we're reading 3.1 now.
CAPCOM 15, Houston, that's excellent; I guess we can go ahead with pressurizing the LM.
SC Okay.
PAO This is Apollo Control at 33 hours, 33 minutes. The Apollo 15 crew has picked up some time in the flight plan. We're unable to determine at the moment whether the TV will be precisely on schedule. However, Flight Director Milt Wendler says that it could be and if there is a delay he believes it will be less than 10 minutes - less than a 10 minute delay. Apollo 15 now 127 861 nautical miles from earth, traveling at a velocity of 4427 feet per second.
CAPCOM 15, this is Houston, can you tell us how the pressurization is going?
SC Well, we're all squared away and the probe is coming out.
CAPCOM Roger, and if you could give us the high-gain angles there, we'd like to get that going.
SC Okay, we'll set them up.
SC Okay Houston, the probe is out and it worked very smoothly.
CAPCOM We copy.
CAPCOM 15, Houston, we'd like to have narrow beam please.
SC Okay Karl, you got narrow.
CAPCOM Thank you.
CAPCOM 15, this is Houston. Whenever you have a chance up there, we're interested in seeing some TV.
SC Roger. We thought we'd get the tunnel cleared out because with all the extra gear in the command module it's sorta tough to find a place to stow everything and the TV is right now sort of in the way so we'll try and get to you as soon as we can.
CAPCOM Okay.
SC It's a new world in this command module with all these extra boxes and everything.
SC Houston, this is 15.
CAPCOM 15, this is Houston, go ahead.
SC Roger, we had an AC bust 2 light and a main bust D underbolt. Voltage looks good and AC bust 2 looks good, reading 28.5 volt on main bust D and AC bust 2 looks good. About that time we had a loss of S-band - I don't know whether it was clinched in or not.
CAPCOM We copy.
CAPCOM 15, this is Houston. We saw some of those problems here on the ground too, and we would like to get back on the high-gain if you would reacquire.
SC Okay.

END OF TAPE

SC Okay Houston, you should have the high gain now.

CAPCOM Roger 15, give us narrow beam please.

SC Narrow. Okay Houston, the LMP is in the LM.

CAPCOM Houston copies.

SC And how is your high gain?

CAPCOM High gain is perfect.

SC Okay.

CAPCOM 15, this is Houston. Could you give us a description of any actions you took when you had that electrical glitch?

SC Karl, Jim just reset bus and everything seems to be okay now. He checked the voltages and they were fine.

CAPCOM Thank you.

PAO We're getting a black and white picture now. It should be coming up color soon.

CAPCOM 15, this is Houston.

SC Hey, Karl, are you getting anything in on the TV?

CAPCOM Negative, we have no signal yet. Pardon me, something is just now coming down.

SC Okay fine, I'm over in the LM with him and they're just going through the checklist. I'm over in the LM with him and they're just going through the checklist.

CAPCOM Very good. 15 this is Houston, we're getting a reasonably good TV signal from you and we have about 4 procedure changes connected with the ASA heater circuit breaker coming up at about 34:30 in your timeline and we'd like your choice as to whether I read it up to you as a block, or whether you want us to read it to you step by step, when the time comes.

SC Houston, 15. Hey, Karl, how about waiting until Jim and Dave get on comm and then read up the procedure.

CAPCOM Roger.

SC If that's satisfactory, let's do it that way.

PAO This is Apollo Control at 34 hours 1 minute. Dave Scott and Jim Irwin are going through a LM checklist to insure that all the switch settings in the LM are the same as they were prelaunch. That they have not somehow changed positions since launch.

CAPCOM 15, this is Houston.

SC Go ahead Houston, 15.

CAPCOM 15, when you had the S-band loss back there a few minutes ago, we think the problem was basically on the ground and when you lost uplink, it's likely that your high gain antenna sloughed against the limits and we wondered if there was any circuit breaker resetting required to get you

APOLLO 15 MISSION COMMENTARY 7/27/71 CST 1824 GET 33:50:02 98/2

CAPCOM back up.

SC Okay, Karl, stand by 1, and I'll find out.

Negative Houston, no circuit breakers are reset.

CAPCOM Very good. And Al, we're getting a real good picture down here.

SC Okay, Karl.

PAO The conversation since the start of the TV has been between Capcom, Karl Henize and command module pilot, Al Worden, Major Worden reporting that Dave Scott and Jim Irwin are not on the air ground communications while they are completing the checklist.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/27/71 GET 34:07:00 CDT 18:41 99/1

PAO You can get brief glimpses of Dave Scott from time to time on the left. His head coming into view now. Checking part of the Environmental Control System now.

CAPCOM 15, the TV picture is beautiful and we're going to give that camera man an honorary union card.

SC That camera man's got too many hands busy to answer you right now, Karl.

PAO We're getting a look at Jim Irwin now.

SC Houston, 15.

CAPCOM 15, this is Houston.

SC Okay, give us a time hack would you Karl, please? G.E.T.

CAPCOM Roger. We're counting up to 34 hours 11 minutes and 50 seconds. 4, 3, 2, 1, mark.

SC Houston, 15.

CAPCOM 15, go ahead.

SC Rog. If you're ready Dave and Jim are ready to activate the COMM now.

CAPCOM Roger. Did you get that time hack okay.

SC Yes sir. Sure did thank you.

PAO Picture's coming from 129,473 thousand nautical miles in space.

SC Houston, 15.

CAPCOM 15, go ahead.

SC Rog, Karl. You guys ready to start a COMM check now?

CAPCOM Roger. We're ready down here for a COMM check.

SC Okay, coming your way.

PAO That looked like Al Worden coming through the tunnel there.

ENDEAVOUR Falcon, this is Endeavour reading you 5 square. (garble).

CAPCOM Endeavour, this is Houston. I got your message loud and clear.

ENDEAVOUR Houston, Endeavour.

CAPCOM Endeavour, this is Houston. Go ahead.

ENDEAVOUR Rog, Karl. Just been calling you on S-band.

CAPCOM Sorry about that. They're just telling me here that we do have some problems and we need to stand by for a few more minutes.

ENDEAVOUR Okay, understand. Standby for a few minutes before we try again.

PAO Problem is with the tracking station at Goldstone. It's expected to be cleared up very shortly.

APOLLO 15 MISSION COMMENTARY 7/27/71 GET 34:07:00 CDT 18:41 99/2

PAO Goldstone is ready now.
CAPCOM 15, this is Houston and we're all set up for
the voice check.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/27/71 GET 34:27 CDT 19:01 100/1

CAPCOM 15, Houston is now configured to go along with you on the voice check.

ENDEAVOUR Houston, this is Endeavour. Apparently Falcon is reading you five square, but you are not reading him.

CAPCOM That's correct, I've had no messages from Falcon.

ENDEAVOUR Okay, he has been calling you though.

ENDEAVOUR Houston, 15.

CAPCOM 15, This is Houston.

ENDEAVOUR Okay, Karl, what are you receiving, are you getting any low bit rate from the LM, from the Falcon?

CAPCOM That's affirmative.

ENDEAVOUR You are, okay. Houston, this is Endeavour. Be advised Falcon is on high bit rate, we'll give you another call.

CAPCOM Roger.

CAPCOM Falcon, This is Houston. How do you read?

ENDEAVOUR Houston, This is Endeavour again, apparently Falcon is still reading you, but you are not reading him. How do you pick him up with high bit rate?

CAPCOM Endeavour, Houston is getting the high bit rate okay, and we'd like to have you hold this present configuration while we think a bit.

ENDEAVOUR Okay, Karl.

FALCON Aren't those pretty? Say again. Aren't those pretty little things. Oh boy, navy blue, yet. Colorful. Too bad they don't work very well. (garble) been watching configure the camera. They do. Yeah. That might be embarrassing. Really. Cause you might not get a con . . . should be back over on the right hand side. Oh my! You had it last, Al when you were cleaning up the screens. I put it in that compartment there, Al, just above the emergency medical kit, compartment above the emergency medical kit.

CAPCOM 15, this is Houston. We are reading you on vox.

FALCON Okay, good I'm glad you're reading us, Houston, finally. Are we coming through loud and clear now, Karl?

CAPCOM Roger, Falcon, you are coming through loud and clear.

FALCON Okay, guess while we are in this position, we ought to go back to low, we've got . . . we ought to go back to low bit rate. Yeah. One little problem we ought to discuss with you before we go on. It seems that somewhere along the way, the outer pane of glass on the tape

meter has been shattered. I don't know whether you can get a picture of it on the TV or not, we'll get Al to try and zero in, but about 70% of the glass is gone. The inner pane of glass seems to be okay, there's no apparent damage to the tape meter itself. Its sitting on 520 and 482, but I don't whether you can see it or not, but I'll trace the area which is missing with my finger here. And it looks like the pieces we found, I found one piece that's almost an inch in size, and there are some small ones around. We'll try to pick it up with the tape and then get the vacuum cleaner later on to get it all up. So far that's the only obvious discrepancy we've found.

CAPCOM Roger, Dave, we are reading you loud and clear.

FALCON When I go back. Okay, back to low bit rate, let's try that. Yeah. Camera's configured, Dave. Okay. Okay, we are on low bit rate.

FALCON Houston, how do you read Falcon on low bit rate?

CAPCOM Falcon, Houston is reading you loud and clear on low bit rate.

FALCON Roger we read you the same. Okay, let's go back biomed right and high bit rate. Okay. High and low.

FALCON Houston, This is Falcon. On high bit rate, with biomed right, how do you read?

CAPCOM Roger, Falcon, we are reading you loud and clear.

FALCON We are reading you the same.

END OF TAPE

FALCON Houston, this is Falcon again, biomed right and low bitrate.

CAPCOM Roger Falcon, we're reading you loud and clear on biomed right, and low bitrate.

CAPCOM Endeavour, we're not reading Falcon at the present time and we've had loss of signal.

ENDEAVOUR Houston, Endeavour, roger, understand, and wonder if you just got that last piece on the TV there, it was a piece of gray tape with some glass on it that came out of the tape meter.

CAPCOM We're getting a very good picture of it, thank you.

ENDEAVOUR Rog.

FALCON Houston, this is Falcon, how do you read?

CAPCOM Falcon this is Houston. Reading you loud and clear. How us?

FALCON Houston, we caught the first part of your transmission, and then you were cut out.

CAPCOM Roger Falcon this is Houston, how do you read us?

FALCON I read you loud and clear.

FALCON Okay Houston we're in PCM high. How do you read?

CAPCOM Roger, Houston is reading you loud and clear, and did I understand PCM high?

FALCON That's affirm. Houston this is Falcon standing by for a voice and range check.

CAPCOM Roger Falcon, we're ready for step 8.

FALCON Houston, we're configured for step 8.

CAPCOM Roger Falcon, we're reading you loud and clear, how us?

FALCON Loud and clear.

PAO The picture is Dave Scott, the voice is Jim Irwin.

FALCON ED voltage reading 37 on both.

CAPCOM Roger Falcon we copy that. Falcon this is Houston.

FALCON Go ahead Houston, Falcon.

CAPCOM Roger, we'd like to tell you that the initial problem with S-band was a ground problem and it looks as though all of the comm checks are go, and we would like to ask if RVHF uplink was okay.

FALCON Okay, VHF A and B both checked out with Endeavour loud and clear and since we don't have anything other than the sequence camera to check out here we're going to check that out and then power down and take care of the rest of the housekeeping without the power.

CAPCOM Roger Falcon.

APOLLO 15 MISSION COMMENTARY 7/27/71 CST 1909 GET 34:35:25 101/2

CAPCOM Falcon, this is Houston.

FALCON Go ahead Houston.

CAPCOM Be advised that we have had an excellent TV show here, and that you can secure it as you like. And I'd like to remind you that we have an update to the LM contingency checklist that we need to make before you leave the LM.

FALCON Okay, we'll take that over in the command module, Karl. We'll go ahead and power the LM down now and clean up the housekeeping and see you on the other side.

CAPCOM Falcon stand by. We're interested in the OPS checkout.

FALCON Rog, we can give you that from the command module.

CAPCOM Roger.

FALCON We'll do all the housekeeping. We'll just give you the report from Endeavour.

CAPCOM Falcon that all sounds good and only one other matter and that's the docking index angle as you go back through.

FALCON Rog, we checked that, it was .1.

CAPCOM We copy.

END OF TAPE

SC Hey, Houston, correction that's a minus .1.
CAPCOM Correction received.
SC It's so close to zero it's hard to tell.
ENDEAVOUR Houston, Endeavour.
CAPCOM Endeavour, this is Houston.
ENDEAVOUR Okay, Karl. I'll go ahead and secure the TV
now.
CAPCOM Very good.
PAO This is Apollo Control at 34 hours 49 minutes.
That television transmission duration was 49 minutes 6 seconds.
The broken glass on the tape meter will not be a constraint
to the mission. Tape meter is the instrument on the Lunar
Module that shows altitude and altitude rate during the landing
sequence and range and range rate during the rendezvous se-
quence. This is Apollo Control at 34 hours 54 minutes.
Telmu the Flight Controller who monitors the Lunar Module
electrical power system got a good look at Falcon's batteries
on telemetry while the Lunar Module was powered up, reports
that the battery condition is excellent. This is Apollo
Control at 35 hours 3 minutes. Apollo 15 now 131,660
nautical miles from earth. Velocity 4,314 feet per second.
SC Houston, 15.
CAPCOM 15, this is Houston.
SC Okay, Karl. I've got the OPS checkout
numbers for you if you want them.
CAPCOM Very good. Go ahead.
SC Okay. Commanders OPS. The first pressure
of 5800, 5800. And a regulated pressure of 3.8. And the
LMB first pressure was 5800, and regulated pressure was 3.85.
CAPCOM Roger. Houston copies.
SC Roger.
PAO That was Al Worden giving that report.
CAPCOM And 15, when Jim has a couple of minutes we'd
like to ask a few questions about the high gain antenna.
SC Okay, he's off the headset right now, Karl.
I'll get him as soon as I can.
CAPCOM Okay.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/27/71 GET 35:35 CDT 20:09 103/1

PAO This is Apollo Control at 35 hours 35 minutes. Apollo 15 is 132,936 nautical miles from earth, traveling at a velocity of 4,278 feet per second. We will continue to stay up live monitoring for any air/ground conversation.

CAPCOM 15, This is Houston.

SC Hi Karl, hey listen, we're starting . . . going to start up PTC here pretty soon, do you want to update which RCS jets you want me to use?

CAPCOM Stand by on that, Al.

SC Okay, I'll go ahead and do the VERB 49 maneuver and start the damping rates.

CAPCOM Negative, Al. We want to stand by in this attitude.

SC Oh, okay.

CAPCOM We . . . we are thinking real hard down here about your AC glitch and its possible connection to the loss of comm.

SC Okay.

CAPCOM Whenever Jim is available, we would be pleased to ask a couple of questions.

SC Rog, Karl, you have to stand by now, he's finishing up over in the LM right now.

CAPCOM Okay. Al, if you are looking for a job, I could read you up a fly by pad.

SC Okay, Karl, be a moment. Okay, Houston, this is 15, go ahead with the pad, Karl.

CAPCOM Roger. Purpose is flyby. SPS G&N 66655 plus 124 minus 011 073 30 5680 plus 02572 plus 02309 minus 03149 331 109 079 NA plus 00208 04676 111 04630 6 and star is 02 1485 264 far side star is NA. Latitude plus 1332 minus 17404 10987 36170 170 59 57 GDC align stars vega and dentem 209 009 349 no ullage comments. The burn is FPS docked. Number 2 use on board preferred REFSMMAT because of yaw gimbal angle. Number 3 LM weight is 36220. And that's all.

END OF TAPE

SC Roger, understand. Purpose is fly by. SDS G&N and (garble) as follows 66655 plus 124 minus 011 073 30 5680 plus 02572 plus 02309 minus 03149 331 109 079 and the next is NA and I missed a couple in there picking up that sextant star would be 02 1485 264. Boresight star is NA, latitude is plus 1332, longitude minus 17404 10987 36170 1705957. Vega and Deneb percent stars with angles of 209 009 349 no ullage. And the SDF docks burn use a preferred REFSMMAT because of the odd gimbal angle and the LM weight is 33260.

CAPCOM The LM weight is 36220.

SC Okay, Karl, understand. 36220.

CAPCOM That's correct and down in NOUN 44 HP is plus 00208, Delta-VT 04676, burn time 111, Delta-VC 04630.

SC Roger, Karl, understand. HA is NA, HP is plus 00208, Delta-VT is 04676 with a burn time of 111. Delta-VC 04630.

CAPCOM Roger. That's all correct.

SC Okay.

SC Houston, this is (garble).

SC Houston, this is Apollo 15. Over.

CAPCOM 15, this is Houston. This is Houston, go ahead.

SC Yes, Karl, this is Jim, I'm back in and on comm. As far as that AC and main bus undervolt I have not much more to add than what I said before. Do you have any other questions?

CAPCOM Roger. Standby just about 30 seconds and we'll come up with a couple.

SC Okay.

CAPCOM 15, this is Houston.

SC Go ahead, Karl.

CAPCOM Jim we've been doing a lot of thinking about that AC glitch down here and the coincidence of time makes us guess that there was a connection with that power loss, but we don't see how. We'd like to start off with a couple of questions. The first one is when you reacquired on the high gain antenna, did you possibly notice that the high gain angles were different from what you'd set on the knobs?

SC Yes, as a matter of fact, they were.

CAPCOM Okay.

SC I did nothing up here to reacquire on the high gain, it came back automatically.

CAPCOM Okay, that's interesting information. Were there any talk backs noted changing state at the time of the glitch?

SC No change that I noticed.

CAPCOM Okay, was anyone in the tunnel at the time

APOLLO 15 MISSION COMMENTARY 7/27/71 GET 36:23:18 CDT 20:57 104/2

CAPCOM of the glitch?

SC Say again about the tunnel, Karl.

CAPCOM Was anyone in the tunnel at the time of the glitch?

SC Standby.

SC Okay, Karl. Al was in the tunnel, but there were no electrical connections being made at the time.

CAPCOM Roger. I guess a follow up question then, and you've probably answered it, was there any unusual activity associated with the tunnel umbilicals?

SC We don't think so - we don't think so, Karl, not at that time.

CAPCOM Okay. And another question on this line, is what was and what is the position of the LM power 1 main B and 2 main B circuit breakers on panel 5?

SC Standby.

END OF TAPE

SC They're both in.

CAPCOM Roger. Okay, if you have some minutes to spare up there, we would like to go through a cockpit check for open circuit breakers connected with main B&AC 2 on the theory that whatever happened might have blown a circuit breaker that wasn't obvious to you.

SC Okay, I'll do that now.

CAPCOM We suggest that . . . you know . . . figures 3-1 and 3-2 are a good guide to that for the normally open circuit breakers.

SC I'll check all circuit breakers.

CAPCOM Jim, I've got the diagrams down here, if there's anything I can do to help you.

SC Okay, we'll look around. Karl, this is Jim.

CAPCOM Go ahead.

SC Roger, on 226, under lighting, Numerix integral, LEB AC 2 has been popped, or I believe it's popped, I'd think it would normally be closed now.

CAPCOM Roger, Jim, we confirm that that is normally closed.

SC Gee, that looks like it might be the problem.

CAPCOM 15, This is Houston.

SC Go ahead, Karl.

CAPCOM When you are through checking the circuit breakers, we have a little procedure we would like to go through here as a . . . as a further check.

SC Okay, did you want me to continue checking, I figured after I -

CAPCOM Stand by. Roger, Jim, we would like to have a complete check there and don't . . . don't reset that circuit breaker, incidentally.

SC Understand. Okay, Karl, I have checked all circuit breakers and that's the only one that seems to be out of configuration.

CAPCOM Okay, very good. What we are going to do, Jim, is to drop the uplink and see what happens, and just to clarify the communications glitch, the ground station lost the power amplifier and we lost uplink to you. There was apparently no loss of downlink. So what we want to do now, is to . . . is to drop the uplink and see if it creates the same glitches as you got on the AC bus that time. In view of your circuit breaker being out, we don't think there is a connection, but we would just like to have this final confirmation. And -

SC Okay, we are standing by.

APOLLO 15 MISSION COMMENTARY 7/27/71 GET 36:35 CDT 21:09 105/2

CAPCOM And to start the procedure here, we would like to just double check that the dials for the high gain antenna are setting at pitch minus 30 yaw 276.

SC Yes, that's correct.

CAPCOM Roger, and verify that we have . .

SC Yaw, yaw is really . .

CAPCOM Go ahead.

SC Yes, we're in track auto.

CAPCOM We . . we would like to have auto in . .

SC Yaw is . . pitch is minus 30, yaw is 270 and track is auto.

CAPCOM Roger, Jim, and what we are going to do now is to drop uplink for 20 seconds and you are to read and record the high gain antenna dials and any changes that occur there, then we'll bring up the uplink and at that time we want you to require . . reacquire high gain antenna on autonarrow, okay?

SC Okay, right now the yaw indicator is reading about 280.

CAPCOM What does your dial say?

SC The dial is 280, the sum wheel is 270.

CAPCOM That's okay, and are you ready for us to drop the uplink?

SC Yes, go ahead.

CAPCOM Okay, we'll be dropping the uplink for 20 seconds. Here we go.

END OF TAPE

CAPCOM 15, this is Houston. How do you read?

SC This is 15. I read you loud and clear.

CAPCOM Roger. Did you observe anything special up there?

SC Nothing other than the pitch went zero and the yaw decreased just very slightly. And of course, when you reacquired it went back to - pitch went back to 30.

CAPCOM We copy. 15, this is Houston. That's enough troubleshooting and we're ready to go to PTC now. And we'd like to have you use the A & D quads for dumping. And use the B and D quads for spin up. And we'd like to confirm that we are using a spin rate of .375 this time.

SC We copied all that, Karl. A and D dumping, B and D for spin up. And .375 for the rate.

CAPCOM Roger.

PAO This is Apollo Control, 37 hours 4 minutes. Apollo 15 now 136,611 nautical miles from earth, velocity 4,173 feet per second. We'll attempt to recap and summarize what we've been doing here for the last hour or so and some of these tests we've been running. The Goldstone tracking station lost power amplifier affecting a transmitter and we had a temporary loss of data. At the same time on the Command Module an AC bus voltage alarm occurred. We've been running some tests to see whether there was any connection between the mishap at the tracking station and the alarm on the spacecraft. It now appears that these two things were coincidental, that there was no connection. We found an AC lighter circuit circuit breaker that has popped, which would have given the alarm. The crew has checked all the circuit breakers. This circuit breaker going out would have triggered the alarm seen in the Command Module. The circuit breaker affects only some lighting in the Command Module and can be worked around if it presents a problem. We see no major problems at the present time on the spacecraft in connection with this. This is Apollo Control at 37 hours 9 minutes. The Flight Controllers who monitor Lunar Module systems have been reporting to Flight Director Milton Windler on the status of these systems as they were observed by telemetry during the LM activation period. They all appear to be in good shape. The batteries look good, the decent propulsion system parameters are normal. The LM reaction control system parameters all normal. The super critical helium pressure is good. That's the pressurization for the decent propulsion system.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/27/71 GET 37:10 CDT 21:44 107/1

CAPCOM 15, This is Houston. Your rates look low enough to go into spin up, if all your vents have been closed.

SC Okay, Karl, I think we got everything closed, and we'll go ahead and spin her up.

CAPCOM Very good.

PAO This is Apollo Control. This spin up will establish the passive thermal control mode for the rest period. Spacecraft will be rotated at a rate . .

CAPCOM Please confirm that you are on OMNI Bravo.

SC That's affirmative, Karl. We are on OMNI Bravo.

CAPCOM Thank you.

PAO The desired rotation rate for PTC is 3 tenths of a degree per second.

CAPCOM 15, This is Houston. We have a readout down here that Al jet is on, could you confirm that? And if it is on, lets turn it off.

SC Roger, Houston, 15. Your readout is correct and it is now off. Sorry, Karl, I overlooked that one.

CAPCOM Thank you.

CAPCOM 15, this is Houston. Your spin up is looking very good to us, and when you have a couple of minutes to listen we have a brief status report to send up to you.

SC Okay, go ahead, Houston, we're standing by.

CAPCOM Okay, in regards to your range rate tape meter, that is normally sealed in a helium atmosphere at 15 PSI and with that outer glass broken, this seal is broken and the meter is now operating in zero to 5 PSI in an oxygen environment. We don't know that this has any effect on it, but Grumman is doing tests to show whether or not its okay. Concerning the SPS . . yeah, go ahead.

SC I was just going to say, it would be interesting to hear what they find out.

CAPCOM Roger, we'll let you know. Concerning the SPS, we're still reviewing the LOI procedures that we'll use, but it's probable that we'll want to start automatically on Bank B and bring A 5 seconds later, using the circuit breaker and turning it off at 6 minutes and finishing up the burn on Bank B. Its probable that the other burns except for TEI will be done on bank B only. Any comments on that?

SC No, that's just about what we were thinking too, Karl.

CAPCOM Okay. In the LM, the batteries and the SHE look in perfect shape, and concerning the lighting circuit breaker problem, we're still getting in

the data in down here and we'll review the situation with you tomorrow. We see no problem with the high gain antenna and other than . . . and other than your crew status report, and your onboard readout, that just about wraps up the evening. We would still like to have your PRD readout and I guess we have a battery charge in progress that will need to be cut off.

SC Okay, Karl, we'll finish up the rest of the items here and bring you up to date on all the readouts, and sorry about the PRD, but as soon as we get in our suits (garble) up here tonight.

CAPCOM Okay, no problem on that and I have a . . . I have the updates to LM contingency check list and if you want to take it this evening I can give it to you, otherwise it can be put off until tomorrow.

SC Okay, stand by.

CAPCOM 15, This is Houston. I heard you trying to come through, but we were noisy just then. Hold off for just a minute.

SC Houston, 15.

CAPCOM Reading you better now, go ahead.

CAPCOM 15, This is Houston.

SC Houston, 15.

CAPCOM 15, This is Houston, I'm reading you loud and clear.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/27/71 GET 37:28:40 CDT 22:02 108/1

CAPCOM 15, this is Houston. How do you read?
SC You're loud and clear.
CAPCOM Roger. Did I understand that you were ready
for the LM flight plan - contingency checklist update?
SC Yes, I am, Karl.
CAPCOM Roger. On page 1-1 down under power trans-
fer and RCS heater activation.
CAPCOM At the end of step 2 add the following line.
Circuit breaker 16, stabilization/control, ASA close.
SC Okay, I copy that.
CAPCOM Roger. On page 1-7, under AGS activation.
Okay?
SC No, standby.
CAPCOM Add before step 1, verify ASA circuit breaker
has been closed for 10 minutes.
SC Roger, the step before step 1 verify ASA circuit
breakers been closed for 10 minutes.
CAPCOM Roger. The next one is page 2-5. And on
that circuit breaker configuration in the second row down
put a black dot under the ASA circuit breaker.
SC Okay, understand.
CAPCOM And on page 2-13. Under AGS activation
and self test add before step 1, verify ASA circuit breaker
has been closed for 10 minutes.
SC Okay, I copied all of that.
CAPCOM Very good. That's all of the update.
SC Okay, thank you, Karl.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/27/71 GET 37:40:00 CDT 22:14 109/1

PAO This is Apollo Control at 38 hours 27 minutes.
Apollo 15 is 139,914 nautical miles from earth, velocity
4,082 feet per second. Apollo 15 will reach the halfway
point in time to lunar orbit at 39 hours 17 minutes 21.7
seconds. At that time distance from earth will be 141,860
nautical miles and it will be 86,864 nautical miles from
the moon.

END OF TAPE

APOLLO 15, MISSION COMMENTARY, 7/27/71, GET 38:30, 110/1

CAPCOM 15, this is Houston. How are you enjoying dinner?

SC It's just fine Carl.

CAPCOM Great, glad to hear it. Hey, we'd like to ask a question about that last breakage in the LM. Did it shatter in little bits or just a few big hunks? How well do you think you got it cleaned up?

SC I think we probably got about, maybe 50 or 60 percent of what was broken, and it was broken into some pieces on the order of three-quarters to an inch. And other little millimeter type pieces.

CAPCOM Okay. That gives us a picture of the situation. We're somewhat concerned about that having drifted into equipment or, yeah, into equipment.

SC Okay, well we looked around and picked up what we could with tape, and we took the vacuum cleaner over and ran it for quite a while to try and pull up what we could.

CAPCOM Very good.

SC We don't have any idea why it broke. It didn't look like there was anything in the ISA which could have done that to the, justt he face of that meter. The ISA had mostly soft equipment, it was pretty well padded.

CAPCOM Okay.

PAO This is Apollo Control at 38 hours 47 minutes. G and C says the passive thermal control has been established satisfactorily on the first try tonight. So, we'll not need another attempt to do that. Apollo 15 is 140 707 nautical miles from earth, velocity 4060 feet per second. Crew should be going through the presleep checklist very shortly now. Rest period scheduled to start at 39 hours. We'll continue to stand by live for the final air to ground transmissions of the day.

END OF TAPE

APOLLO 15, MISSION COMMENTARY, 7/28/71, CDT 23:24, GET 38:50, 111/1

CAPCOM 15 this is Houston. We're ready to terminate the charge on BAT A now.

SC Roger. Terminate charge on BAT A.

CAPCOM And incidently we see an OFF nominal drain on BAT A and we'd like to varify that the pitch 1 and the yah 1 circuit breakers on panel 8 are open. If not we'd like to open them.

SC Okay. Standby.

SC Circuit Breakers are varified open. Over.

CAPCOM Thank you. And let's leave the open.

SC Roger.

CAPCOM 15, this is,- 15 this is Houston. I want to correct a false impression I gave you. We don't see any anominal drain on batter A.

SC Oh, that's good. Thank you.

PAO This is Apollo Control at 39 hours 15 minutes. Flight Director Glenn Lunney and his team of flight controllers are now preparing to take over in the Mission Control Room, releaving

SC (garble)

CAPCOM 15, this is Houston, go ahead.

SC Okay. We have a presleep checklist when you're ready to copy.

CAPCOM Roger, 15. Go ahead.

SC Okay. Crew status report, everybody's in good shape. No medication today. The onboard readouts BAT C 37, Pyro BAT A 37.2, B 37.2, RCS A 90, B 89, C 91, and D 89. Diameter being cycled now. The water has been chlorinated, all valves are closed. We're getting ready to pump up the cabin and we'll give you a G memeory dump whenever you're ready.

CAPCOM Roger, Dave.

SC And one more thing, I've got the PRD's for you.

CAPCOM Great. Go ahead.

SC Okay. CDR is 23020, CMP is 5008 and the RMP is 8008.

CAPCOM Thank you Dave. And, incidentally, if you'd like to get rid of that Bio Med Harness you can change OFF now you know?

SC Oh, that should work right now.

PAO This is Apollo Control we're estimating the change of shift News Conference for 12:15 AM Central Daylight Time, in the briefing room at news center. Apollo 15, now 141 903 nautical miles from earth, velocity 4028 feet per second.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/28/71, 39:20 GET, MC112/1

CAPCOM 15, this is Houston. We're ready for the
E memory dump.

SC Roger. And here it comes.

CAPCOM And Dave, we - our telemetry says that
the optics power is still on and we'd like to remind you
to turn it off.

SC Hey, I thought we just got that off.

CAPCOM Sorry about that.

SC Well, Carl, does your telemetry tell you it's
on or off now?

CAPCOM They were just telling me that, hey, it was
off about the time that I called you.

SC Oh, okay.

PAO This is Apollo Control at 39 hours 38 minutes.
We've completed the shift handover here in Mission Control.
At the moment flight director Glen Lunney is reviewing the
status of the mission with each of his flight controllers.
Our capsule communicator on this shift will be astronaut
Robert Parker. A change of shift press briefing is scheduled
to begin shortly in the MSC News Center auditorium. Although
we haven't said goodnight to the crew yet we don't expect
a great deal of conversation with them. Should we receive
any communications between - with the crew during the briefing
we'll tape record that. At the present time, Apollo 15 is
travelling at a speed of 4015 feet per second. The space-
craft is 142 377 nautical miles from earth.

END OF TAPE

APOLLO 15, MISSION COMMENTARY, 7/28/71, CDT 00:23, GET 39:50, 113/1

CAPCOM Endeavor, Houston. Over.
SC Go ahead, Houston, Endeavour, Go ahead.
CAPCOM Roger. Guys, before you go to sleep, I'd like to have the mode, S-band normal mode switch VOICE to OFF, please.
SC S-band normal mode, switch VOICE to OFF.
Is that it?
CAPCOM Roger. And, unless you guys have something else we're going to let you go to sleep now.
SC Okay, Bobby, thank you.
CAPCOM See you sometime.
PAO This is Apollo Control at 40 hours 5 minutes We said good night to the crew about 7 minutes ago at 39 hours 58 minutes. During this sleep period, we'll take the lines down and come up with the hourly status reports. At the beginning of the rest period the spacecraft is in a stable passive thermal control mode, rotating at the rate of about 3 revolutions per hour to maintain the proper thermal equilibrium, exposing all sides equally to the heat of the sun and to the cold of space. Al Worden, the Command Module Pilot, is wearing the Bio Medical Sensors, and we'll have Bio Medical Data on him during the evening. The main task this evening will be to monitor the status of all the systems and review activities for tomorrow, now which is actually Houston time of course is today now, but the crew will be awakening in about 8 1/2 hours or so. At the present time Apollo 15 is traveling at a speed of 3979 feet per second, the spacecraft 143,742 nautical miles from earth. This is Apollo Control standing by.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/28/71 GET 41:06 CST 1:40 MC 114/1

PAO This is Apollo Control at 41 hours 7 minutes. The crew is now about 1 hour into their scheduled 9 hour rest period and we have had no further conversations with them. Apollo 15 at this time is 146 050 nautical miles from Earth. The spacecraft traveling at a velocity of 3 918 feet per second. Again during the evening the principle tasks here in Mission Control will be to monitor the systems on the spacecraft; that we have high bit rate data coming to us through the receiving antenna at Parks, Australia. And we will be monitoring all the systems on the Spacecraft as well as the 1 crewman on whom we have Biomedical Data; Command Module Pilot, Al Worden. And we will be coming up hourly for a status report. This is Apollo Control standing by.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/28/71, GET 42:00, 115/1

PAO This Apollo Control at 42 hours. The crew has now been in their rest period for about two hours. And in Mission Control things have steadied down to a routine of watching the spacecraft systems. And looking at activities coming up when the crew awakens, which is scheduled to occur in about six hours. Apollo 15 now traveling at a speed of 3866 feet per second and out 148 065 nautical miles from earth.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/28/71, GET 43:00, 116/1

PAO This is Apollo Control at 43 hours. The crew now some 5 hours away from the scheduled waking time. And all systems on the spacecraft continuing to perform normally. We're in a passive thermal control mode as we have been since prior to the crew rest period with the spacecraft rotating slowly at a rate of about 3 revolutions per hour. On awakening, the crew will have a relatively light day of activity primarily involving some photography and also they will again enter the lunar module, check such things as the lunar module batteries. At the present time Apollo 15 is 150 293 nautical miles from earth and the spacecraft speed is down now to 3809 feet per second.

END OF TAPE

APOLLO 15, MISSION COMMENTARY, 7/28/71, CDT 4:34, GET 44:00, 117/1

PAO This is Apollo Control at 44 hours. The crew, now about midway through a scheduled 8 hour sleep period. We said good night to Command Module Pilot Al Worden about 39 hours 58 minutes, and have heard nothing from the crew since that time. Very little conversation on the circuits at Mission Control and none of the flight controllers in launching data from the spacecraft have reported any problems or anomalies. Everything progressing very smoothly at this time. Apollo 15 is traveling at a velocity of 3754 feet per second now and the spacecraft is 152 481 nautical miles from earth.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/28/71, 2:02 CDT, 45:00 GET, MC118

PAO This is Apollo Control at 45 hours. We've had good data from the spacecraft throughout the evening and have been watching all of the systems. Everything appears to be normal as it has through the night. The crew is scheduled to end their nine-hour rest period in about 3 hours. Actually they went to bed about an hour later than planned. And we do not plan to give them a call at the scheduled wake-up time. We'll let them continue to sleep if they so desire probably for at least an extra hour. During the past few minutes, flight director Glen Lunney has been reviewing the status of the spacecraft and all of its systems with each of his flight controllers and also running over the activities scheduled for the crew once they awaken, particularly the LM housekeeping with the crew entering the lunar module and among other things checking out some of the systems and checking the batteries on the lunar module. Apollo 15 is presently travelling at a speed of 3700 feet per second and 154 661 nautical miles from earth. We do not, at this time, anticipate that there will be any midcourse correction required at the midcourse correction 3 opportunity, which is at 56 hours 31 minutes. It does appear likely that there will be a midcourse correction at the midcourse 4 opportunity at 73 hours 31 minutes. And the present numbers indicate that that would be about 6 and a half foot per second maneuver, probably performed with the service propulsion system. This is Apollo Control continuing to stand by.

END OF TAPE

MISSION COMMENTARY APOLLO 15 7/28/71 GET 46:00 CST 6:34 MC 119/1

PAO This is Apollo Control at 46 hours. Apollo 15 at the present time traveling at the speed of 3650 feet per second; the spacecraft now 156 700 nautical miles from Earth. And, as a point of interest, about 72 000 nautical miles from the moon. During the night and early morning we have been tracking Apollo 15 on the 210 foot mission antenna at Parks, Australia. Just recently we went out of acquisition of that antenna and are now tracking with the 85 foot dish at Tidbindilla; and we have had a good solid lock-on all during the shift with continuous data from the spacecraft. Everything continues to look good both onboard the spacecraft and with the crew. We've heard nothing from them since we said "good-night" to Al Worden some 6 hours ago. The crew is scheduled to end their rest period in about 2 hours although we do plan to let them continue sleeping for an additional hour or so if they so desire. A relatively light day scheduled on the Flight Plan. The major activities will be photographic tasks aboard the Command Module. Also, Scott and Irwin plan again to enter the Lunar Module for some housekeeping chores and some systems checks on the Lunar Module. At 46 hours, this is Apollo Control Houston.

APOLLO 15 MISSION COMMENTARY 7/27/71 GET 47:00 CDT 7:34 120/1

PAO This is Apollo Control at 47 hours after liftoff. Apollo 15 is now 158 845 nautical miles from earth traveling at a speed of 36 000 feet per second. In Mission Control we're in the process of a shift handover at this time. Flight Director Glen Lunney will be going off shift and will be replaced by Flight Director Gerald Griffin and his gold team of Flight Controllers. The Capsule Communicator on the upcoming shift, the CapCom will be Astronaut Joe Allen. We do anticipate a change of shift briefing. That will occur in the MSC News Center Briefing Room in about 1 hour. There is about 1 hour remaining in the crew rest period. However, if the crew desires to sleep an extra hour, we plan to allow them to do so. A call will not be made to the crew at the scheduled wakeup time unless we hear from them first. At 47 hours, this is Apollo Control Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/28/71 GET 47:56 CDT 08:31 121/1

PAO This is Apollo Control, 47 hours 56 minutes ground elapsed time. Crew of Apollo 15 still asleep At this time. They're lying and they have an extra hour in their sleep period unless they call first. Spacecraft now 160 800 nautical miles out from Earth traveling at an ever decreasing velocity of 3553 feet per second. Hand over is complete from the black team of flight controllers to the Gold Team. Flight director Jerry Griffin going over the day's activities with the various console positions here in the Control Room. The Black Team Flight Director Glynn Lunney will be holding a change of shift press conference in the next few moments in the small Briefing Room in the Houston News Center. And at 47 hours 57 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/28/71 GET 49:03 CDT 09:35 122/1

PAO This is Apollo Control, 49 hours 3 minutes ground elapsed time and about 1 hour past the scheduled wake-up time for the crew of Apollo 15. Spacecraft Communicator Joe Allen will be giving the crew a call in the next few moments as soon as the voice net is configured properly. Let's listen in.

CAPCOM Good morning, Apollo 15. This is Houston. Do you read, over?

PAO It seems the voice subcarrier is not up yet to the spacecraft waiting for the network to be completely set up to handle a two-way communications, meanwhile, some distance and velocity numbers. Apollo 15 now 163 140 nautical miles out from Earth. Velocity now 3499 feet per second. We'll leave up the air-ground circuit live until the crew does respond.

CAPCOM Good morning Apollo 15, this is Houston, are you awake yet, over?

SC Good morning, Houston. This is 15. Reading you loud and clear there, Joe. Good morning.

CAPCOM Good morning, Alfredos. Sounds like you had a good night sleep. We're standing by for crew status.

SC Okay, Joe. We certainly did have a nice sleep. and it looks like your tracking data must --

END OF TAPE

SC Okay, John we certainly did have a nice sleep and we think your tracking data must be right, the moon is getting bigger out the window.

CAPCOM Roger, Al. At least our direction is right.

SC appears that way.

CAPCOM Joe, this is Al. We'll give you a status report here in about 5 minutes when you're organized.

CAPCOM That sounds good Alfredo, and if you like, I'm standing by down here with a PAO Gold Bugal Morning News if you would like to hear some.

SC Joe, can you stand by for a minute on that. We wouldn't want our LMP to miss it.

CAPCOM No, I agree he should be aware of it. I'll stand by.

SC Joe, Jim's awake here now. We're ready to listen. (garble)

CAPCOM Roger.

CAPCOM Okay, Apollo 15. This is your friendly news reporter with the morning news. Apparently the Houston Post reported yesterday that the Falcon's checkout went smoothly, and the mission is proceeding on schedule. The inside pages show drawings of how you will deploy the lunar roving vehicle. They didn't tell us anything I think we don't already know so I won't go into the details of the drawings. In national news, we may be losing communications now, I'll stand by.

CAPCOM 15, are you reading Houston clearly?

SC Yea Joe, we're back with you.

CAPCOM Alright. Moving right along now in national news, secretary of labor Hodgson has asked the united transportation union and the rail industry to put their dispute before a neutral panel for settlement. U. S. senate will vote today on an amendment to delay a federally guaranteed loan to Lockheed. The vote is expected to be very close. In local news, a Texas animal health commission employee said that he thinks that the harris county vaccination program against sleeping sickness is almost at an end. I don't know if they're going to institute preflight quarantine on the animals or not. And more than a hundred people were arrested during a raid of the Arlington Country Club in Texas last night, and gambling equipment was confiscated. Maybe you left town just in time. In sports yesterday, the Baltimore Orioles increased their lead to 4 games in the American league east by winning the double header from the Oakland Athletics 1 0 and 6 4. And the Houston Astro's split a twi-night double header last night with the Phillies 8 -

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/28/71, 0950 CDT 49:15 GET 124/1

CAPCOM A twilight double header last night with the Phillies, 8 to 3 and 5 to 1. Mohummad Ali announced that he will fight Jerry Quarry September in the Astrodome and Ali also wants a rematch with Joe Frazier sometime in March, 1972. The Oilers have trimmed their roster to 59 players by placing two of the players, Johnny Peacock and Tom Smiley on waivers. Four golfers were inducted into the American Golf Hall of Fame last night. They are Julius Boros, Cary Middlecoff, Jock Hutchinson and the late Walter J. Travis, and we hate to tell you this, but Elizabeth Taylor is a grandmother at age 39 when her 19 year old daughter-in-law gave birth to a 6 pound 2 ounce girl yesterday. And that's all from the Houston MOCR News Center.

SC Okay Joe. Thank you very much for the weather and news this morning.

CAPCOM Okay, Al, and I have a CSM consumables update and a number of other things when you're ready to listen to them.

SC Okay, Joe, stand by one.

CAPCOM Roger.

SC Houston, this is 15. We are ready to copy (garbled)

CAPCOM Al, stand by. We're not receiving you clearly.

SC Okay, standing by.

CAPCOM Rog, it's very weak and severe noise in the background. We're standing by for better COMM.

SC We understand.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/28/71, GET4920 CDT0955, 125/1

CAPCOM Al, this is Houston. The noise seems to have quieted down again why don't we give it another try.

SC Okay, Joe would you like to copy our consummables and then you can pass up S-band.

CAPCOM Okay.

SC Okay, RCS 90 89 90 and 89. On H2 92 90 70. O2 90 90 and 85.

CAPCOM Roger, Jim. We copy all that. Let me give you a set of figures here. They agree very closely to what you've read to us at GET 48 plus 00 the RCS total was 87 and then Quad A 86 87 86 87. H2 tank 92 92 70. O2 tank 90 92 85. Over.

SC Okay, I copied all those. As far as sleep Dave figures 8 hours and 2 segments, Al was 8 hours for 2 and I figure I got 9 hours in about 3 segments.

CAPCOM Roger, we copy that. Sounds like that's the most sleep you've had in several months. Out of curiosity, since we're coming up on this eye flash experiment I wonder if any of you has noticed any of the flashes yet?

SC Yes, we have noticed them both nights, Joe.

CAPCOM Okay, I guess we'll talk more about that a little later on. I have a number of other things to read up to you, in whatever order you would like. They include a fairly extensive flight plan update, nothing profound but it will require some certain amount of writing and then a few miscellaneous questions which we'd like to ask you.

SC Okay, I guess I can start on the flight plan bit.

CAPCOM Okay, Jim, and are you the recording secretary this morning?

SC Yes.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/28/71 GET 49:25 CDT 10:00 126/1

CAPCOM Okay, Jim. Before we start, did you get the radiation dosimeter readings for us?

SC We reported them last night. Do you want them again this morning?

CAPCOM Apparently, we'd like them again this morning on schedule.

SC Okay, stand by.

SC Okay, Joe. I have a radiation report for you.

CAPCOM Go ahead.

SC Okay, radiation on Dave is 23023, A1, 25009, and mine is 08010.

CAPCOM We copy those, Jim, thank you and normally, I guess we'd like those in the post-sleep period as opposed to pre-sleep which is when we got them yesterday. I guess it's in the check list that way.

SC Okay. We'll normally do it that way.

CAPCOM Okay, fine, and I'm ready to start with the flight plan update when you're set up to copy up there. I'll start at about 5450.

SC Okay, let me get 5450.

CAPCOM Fine, Jim. And we're coming up on a omni switch. When we're on the new antenna, I'll start to read. You might want also your LM activation check list handy because we'll be using it later on.

SC Okay.

END OF TAPE

SC Houston, how do you read 15?

CAPCOM Jim, you're loud and clear and we're ready down here if you are.

SC Okay, I'm at 5450 on the Flight Plan.

CAPCOM Okay, before I start into it step by step, let me just say that it's basically - the change is basically moving some of the items around in time and it's not many changes in procedures involved, but the one main thing is we're going to ask you to go into the LM a little early, I guess, earlier than you had planned. And we're going to also request that you give us enough - that you bring enough of the telemetry online so we can look at the LM batteries. And there's no particular reason we want to do this today. Nothing that we suspect is wrong, but rather, apparently the systems people are interested in a better granularity in data points that they're taking on these batteries. That's the reason for this particular addition. Other than that, I think there is nothing at all very different about this flight plan update, other than a few minor changes. And I'll go ahead and start if you're ready.

SC Okay, I'm ready Joe. We understand.

CAPCOM Okay. 5450, the step: If LM/CM Delta P less than 2.7 psid, LM tunnel vent valve panel 12- vent until Delta P greater than 2.7 psid.

SC Okay, I have if LM/CM Delta P, if less than 2.7 psid, LM tunnel vent valve on panel 12- vent until Delta P greater than 2.7 psid.

CAPCOM That's correct. Now turn one page to 55 plus 15..

SC Okay, I'm there.

CAPCOM Insert: Stop PTC at ROLL 50 degrees, high gain antenna angles, PITCH minus 48, YAW plus 82.

SC Roger, it. 5515 stop PTC roll 50 degrees, high gain antenna PITCH minus 48, YAW plus 82.

CAPCOM That's correct. Now turn back several pages to 3-54 please. And that's the cycle film and pan and maps page - procedures page.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/28/71 1010 CDT 49:35 GET 128/1

CAPCOM map cameras page, procedures page.

SC Okay, I have it.

CAPCOM Okay. Down near the bottom delete the line FM sector 1, FM AC power off, and add in its place map camera on, that should read map camera on standby/talkback gray. Over.

SC Okay, understand delete SM sector 1 SM AC power off and add mapping camera on to standby talkback gray.

CAPCOM That's correct. Now turn back to 55 plus 50 and there's a long series of deleted activities that will follow. These - all because we're not going to do a midcourse 3, as you're well aware, and I'll call them out line by line and they all want to carry through for I guess about a page and a half here. At 55 00.

SC Okay, go ahead.

CAPCOM Delete P30 external DELTA-V and V49 maneuver to pad burn att. Turn the page. Jim, I've apparently made a mistake on that. That should have been 5550. I think you're at the right place. Continuing on over to 50 -

SC Yes, I got it.

CAPCOM Rog. Continuing to 56 plus 00, delete the next 7 lines up to the 2 lines which you should leave in, 02 fuel cell purge and waste water dump.

SC Okay, I have that.

CAPCOM Okay, continuing - continue deleting the lines below that down to 57 plus 00.

SC Okay, so the only two actions we have on that page 56 hours is the 02 fuel cell purge and the waste water dump.

CAPCOM That's affirm. Now, once again backing up to the time 55 plus 50. That should read VERB 49 maneuver to LM checkout attitude and that attitude is 305, 090, 000. High gain angle pitch minus 30, yaw 276.

SC Okay, VERB 49 maneuver to LM checkout attitude is 5550, attitude 305 090 and 000. High gain pitch minus 30 and yaw 276.

CAPCOM Readback is correct, Jim. I'll stand by till we get another OMNI change.

SC Okay.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/28/71 GET4941 CDT1015 129/1

CAPCOM 15, Houston our COMM's quieted down again and I'll continue if you're ready.

SC Okay, I'm ready, Joe.

CAPCOM Roger, Jim, at 56 plus 50 start PSM systems checklist, IVT to LM and this is an item that's moved up from 57 20 by the way.

SC Okay, at approximately 6:50 start CSM check list, IVT to LM.

CAPCOM That's correct and you are to start that checklist from the beginning in that 57 plus 00 you move the CSM PTC procedures to completion of our LM battery checkout. I guess that's an item for Al.

SC Okay, understand. We'll move all that GARBLE to the PTC until after we complete the battery checkout.

CAPCOM That's correct and that should come around 57 plus 50 or perhaps a little later, but once again, not time critical. We're coming up on 57 plus 30 and if you'll take out your LM activation checklist, page 11, please.

SC Okay, I have it.

CAPCOM Okay, and this is to start at 57 plus 30, perhaps you should put a mark in your timeline but then on the checklist from page 11 delete tom carrier CWG connector. Delete step 2. Delete step 5.

SC Okay, on 11 I delete tom carrier CWG connector, step 2 and step 5.

CAPCOM That's affirm. Do page 1-13 and if you'll turn to that, do 1-13 ACCEPT, in step 2 in step -

END OF TAPE

CAPCOM Do 1-13 except in step 2. In step 2 delete B HFB transmitter closed. B HFA receiver closed. PDR audio closed. And add the instruction CB 11 ECS cabin fan closed.

SC Okay, Joe. 1 13 under step 2, to delete B HFB transmitter closed, B HFA receiver closed, commander audio closed, and add CB 11 ECS cabin fan closed.

CAPCOM That's correct Jim. Do page 1-14 except in step 5. Delete B HFA transmitter closed, B HFB receiver closed, and delete step 6.

SC Okay, on 1 14 we'll do all that. Under step 5 we'll delete the B HFB transmitter closed, B HFB receiver closed and we'll delete step 6.

CAPCOM Read back correct, and add steps 7 your comm S-band configuration is PM secondary, primary off, PCM all three sets off, and high.

SC Okay, the S-band configuration is PM secondary, primary off, PCM all three set off and high.

CAPCOM That's correct. We'll want you to stay in that configuration for 15 minutes while we take the data, after that time do page 1-18 and 1-19.

SC Understand we stay in that configuration for 15 minutes and do 1 18 and 1 19.

CAPCOM Okay, Jim. Sounded fine. Now back into your time line at 57 plus 45, proceed with LM house keeping. And we've got some words here on the house keeping. I'll read them to you and I guess copy down whatever you think that you haven't done yet.

SC Okay, understand 57 45. We're to proceed with LM house keeping and go ahead with your steps Joe, I'll know what to do.

CAPCOM Okay. Vacuum cabin sand filter, and the sub-group under this, you unsnap netting around cabin fan filter, then you vacuum filter, but do not scrub bristles of the vacuum cleaner over the surface of filter.

END OF TAPE

CAPCOM Then you remove the remaining particles on cabin fan filter with sticky paste using care not to dislodge filter material. Then you remove the particles on the inner screen of the vacuum cleaner with sticky tape, and finally, replace the netting.

CAPCOM And Jim, that's the end of that procedure. Our comm is certain to fade out on us so we may not be able to talk to you. Hopefully, your talking is clearer still.

SC (garble).

CAPCOM Okay, Jim. And just an added note on that. As you're well aware, we're interested in cleaning up as many of those flying glass particles as we can which is primarily the reason for this procedure.

SC Yeah, we quite agree, Joe.

CAPCOM Okay, at the time, 57 plus 45 the steps S-Band aux TV, to Science pan camera power to on and then (for five minutes/off) and finally, S-Band aux TV to off.

SC Okay, Joe, at 57 45 understand that you want S-Band aux TV to Science. Then I missed the information after that and then finally, the last one was S-Band aux TV off.

CAPCOM Okay, Jim. What we are interested in here is looking at the pan camera temperature. In the center step, the one you missed, reads pan camera power to on for 5 minutes and then off.

SC Okay, I understand. Pan camera power to on for five minutes and then to off.

CAPCOM That's correct. At 57 plus 50 CSM, proceed with PTC activation.

SC Okay, at 57 50 CSM, proceed with PTC activation.

CAPCOM Roger, and turning over a page to 60 hours after the step, S-Band aux TV off add pan camera self-test to off. And --

SC Standby Joe.

SC Joe, do you read me now?

CAPCOM Okay, Jim reading you loud and clear.

END OF TAPE

SC Joe, do you read me now?
CAPCOM Okay, Jim, reading you loud and clear.
SC That last information you gave me on S-band
aux TV. I added that in at 57:45. Is that correct?
CAPCOM Jim, no, negative. Turn over the page to
60 hours, 60 plus 00.
SC Okay, I have 60 hours. Okay, Joe, I'm at
60 hours.
CAPCOM Okay, Jim. This is a new step completely at
60 hours. We did say something at 57:45. I'll come back to
that in a minute to make sure that's straightened around, but
at 60 hours after the step in the flightplan, S-band aux TV to
off, add 2 steps, and they are pan camera self test to off and
map camera on to off. Over.
SC Okay, understand 2 steps there after S-band
aux TV off, pan camera self test off and pan camera on to off.
CAPCOM That sounds - that sounds good, Jim.
SC Let's go back to 57:45.
CAPCOM Okay, Jim. At 57:45 the 3 steps you added
in there should be S-band aux TV to science, pan camera power
on for 5 minutes and then off, and S-band aux TV off.
SC Okay, understand that. I guess I got a little
confused there, Joe, when you said turn the page and you turn
several pages to get to 60 hours.
CAPCOM I think you caught me in that. I guess I
did, sorry.
SC Okay, I'm ready to go on to the next one, Joe.
CAPCOM Okay, Jim, that completes the flight plan
update and you should know by now that you have to take me for
what I mean, not for what I say. I do have -
SC Oh, we did.
CAPCOM Rog. I do have a note which you can put down
in the margin or wherever, and it involves subsequent P23
sightings as required.
SC Okay.
CAPCOM And the note is: Reduce trunnion to less than
10 degrees before zeroing optics and then always do optics cal-
ibration after optics zero in P23.
SC Okay, Joe, for subsequent P23 sightings we're
to reduce the trunnion to less than 10 degrees before zeroing
optics and always do the optics cal after the optics zero in
P23.
CAPCOM That's exactly right, Jim, and that is all I
have on my flight plan update. I guess we've got an after-
thought here. I'll get with you in a minute. I do have some
other questions which I'd like to ask, but let me give you this
addition while you have the flight plan there on your lap and
it involves the time 56 plus 20. I'll stand by when you're
there.
SC Okay, I'm at 56:20.
CAPCOM Okay, the step is direct O2 open until cabin
pressure equals 5.7 psia.

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SC Okay, I understand at 56:20 direct O2 open
until cabin pressure equals 5.7 psia.

CAPCOM That's correct.

END OF TAPE

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CAPCOM And, Jim. I'm going to wait until the COMM gets a little better before I continue on here. Be a minute or so.

SC Okay.

CAPCOM Apollo 15, Houston.

SC Alright, Go ahead, Joe.

CAPCOM Jim, we've got about 3 or 4 small questions for you. Your choice whether you'd like to talk about them now or proceed on with the light flash experiment.

SC No. We're going to delay that light flash experiment anyway until we get cleaned up here and have breakfast. So you can ask the questions. We'll be thinking about it while we're cleaning up.

CAPCOM Okay, that sounds good. First one, we noted a very small load change on battery Buss A yesterday several minutes prior to your SPS burn and we're trying to chase down what may have caused this. We suspect that you may have closed two circuit breakers that should have been closed and just are curious to know if you did close them or if when you looked to verify them they were already closed. And, the circuit breakers in question are the SPS PITCH 1 and YAW 1 circuit breakers that feed Batt A.

SC Okay, we closed those per checklist, Joe.

CAPCOM All right, Jim. I understand you closed them for the checklist. By that do you mean that you - when you looked at them you found them open and closed them.

SC Okay, that's affirm Joe. They were open and we closed them per the checklist.

CAPCOM Okay, the guys in the back room here psyched that out pretty well, I guess, thank you. That - I guess that was a question of mostly of academic interest. Al, the circuit breaker in the lower equipment bay AC2 is still out as you are well aware and it affects a number of EL and DSKY lights and so on. We will want to talk to you later on today about this. It should be no problem in any way but we do want to talk about - discuss the ramifications of the various work around which this may involve and, finally, we've been noting during the night some small oscillations in accumulator quantity and we'd like for you please to check your secondary radiators, verify - that's in bypass - that's panel 377.

SC Okay, we're checking panel 377 now.

CAPCOM Okay.

END OF TAPE

SC Okay, Joe on that, on that valve on 277, it was in by pass, and Dave just cycled it to, cycled it to normal and then back to by pass.

CAPCOM Okay Jim, thank you. And that's all we have down here for the time being. I've been reading the Apollo 15 status report that's put out every two hours. What's normally several pages, is just a page today, and with very few words on it, the most prominent one being the word nominal, the meaning of which I'm going to look up as soon as I get off this shift.

SC Very good.

CAPCOM And Jim unless you have any questions, why don't you procede on with a comfortable breakfast, and we'll be standing by for a callout of when your ready to continue.

SC Okay Joe. Thank you.

PAO This Apollo Control. 50 hours 18 minutes ground elapsed time. The crew of Apollo 15 presently preparing breakfast aboard spacecraft Endeavour. Unstowing all of the items for space breakfast. Very lengthy flight plan update read up to the crew by spacecraft communicator Joe Allen. The crew said they would be back to Allen to discuss the days activities after they've had breakfast. Also mentioned that they preferred to delay the visual light flash phenomenon experiment, which is shown in the flight plan at 50 hours ground elapsed time. This particular experiment will be delayed. Visual light flash phenomon experiment is a result of some experiences by previous flight crews on lunar flights. The crews of Apollo 11, 12, 13 and 14 reported seeing light flashes and streaks of light when they were in the darkened command module. Usually when their eyes were closed. Both the translunar and transearth coast and in lunar orbit. These light flashes at a frequency ranged anywhere from .5 to 2 events per minute. One conjecture or hypothesis that's been -

END OF TAPE

PAO one conjecture or hypothesis that's been extended to explain this phenomenon is that the flashes are visual phosphorescences induced by cosmic rays. There is some controversy, however, as to whether the cause is due to cerenkov radiation produced by high energy particles traveling through the eyeball or whether the flashes result from ionizing collisions of these high energy particles in the retina or in the visual centers of the cerebral cortex. At any rate, to conduct the experiment, the crew puts on eyeshades, opaque eyeshades, similar to the television quiz show of several years past. It requires that all 3 crewmen face in the same direction and undergo a dark adaptation period prior to actually beginning oral description of the light flashes. The crewmen will report such things as the ground elapse time to the nearest minute. Of course they can't see their spacecraft timing or clock, they have to guess at it. The frequency of flashes, description of the flashes and also the location of each crewman in the Command Module, and the way that each man is oriented. Apollo 15 is now 165 733 nautical miles out from earth, velocity 3440 feet per second. The crew in the middle of their morning meal at this time. We'll wait for further call to earth to continue with the days activities, which includes further checkout and some housekeeping aboard the lunar module. At 50 hours 23 minutes ground elapsed time and standing by this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/28/71 GET 50:28 CDT 11:01 136/1

(All Dead Air)

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/28/71 GET 50:59 CDT 11:34 137/1

PAO This is Apollo Control at 51 hours 8 minutes ground elapsed time. Apollo 15 now 167 260 nautical miles out from earth, velocity 3405 feet per second. Like most men at breakfast, they're probably reading the morning paper because they're sure not saying anything. We expect to hear from the crew of Apollo 15 after they tidy up following the breakfast meal. As mentioned earlier, the Visual Light Flash Phenomenon Experiment has been delayed by the crew. It was originally scheduled for 50 hours. There is nothing time critical about when they do this. It requires all 3 of them wear the eyeshades for a period of 1 hour, to allow for dark adaptation and then a period of reporting, the flash frequency, the shape of the flashes, the color, et cetera. We'll continue to monitor the air-ground and leave the circuit up live for the time when the communications do resume. At 51 hours 10 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

SC Houston, 15.
CAPCOM Go ahead 15, this is Houston.
SC Okay, Houston. We're getting ready to do the light flash experiment and we'd like to run the tape recorder so we can get the voice marks on it if that won't interfere with any of your
CAPCOM Okay Dave. Stand by. I'll inquire.
SC Okay.
SC Tunnel vent valve.
CAPCOM 15, this is Houston.
SC Houston, 15.
CAPCOM Roger. In answer to your question on the DSE, we'll handle the DSE from down here when we start the eye flash experiment. We do have a request of you before you start the experiment though, we don't have the necessary oxygen purity in the LM yet that we think that we're going to need for the surface EVA several days from now, and consequently we want you to start to - start to vent the LM once again. We're going to drain it out and fill it with oxygen again later on to day, so if you would please turn the tunnel vent valve to the vent position before we start the eye flash.
SC Okay Joe. It's in work.
CAPCOM Okay.
SC Okay Houston and we'll take a couple of minutes here and run a hatch integrity check and make sure it's all fixed up and we'll be with you in about 5.
CAPCOM Roger Dave. Sounds good.
SC Okay, Houston, 15. The tunnel vent sounds pretty good. We can go ahead and start the experiment.
CAPCOM Okay Dave. We're stand by and I could give you -

END OF TAPE

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CAPCOM Okay, Dave, we're stand by and I could give you a few reminders on the experiment here if you'd like them.

SC Okay, go ahead.

CAPCOM Rog, we're just interested in primarily a mark from each of the three of you when you notice a -- a flash and then you might indicate who it is calling it out and then a description as you see it position, color, etc. etc. And if any -- if another one of you notices one in the meantime during the description, call Mark and that one then takes precedent, over.

SC Okay, that's about the way we talked it over, Joe, we're all set, thank you.

CAPCOM Roger. And Dave, we'll be standing by for when --

SC (garble) Houston.

CAPCOM Go ahead.

SC Okay, if you'll start the tape recorder, we'll start.

CAPCOM Roger, Dave.

SC Okay, Houston, 15. We're starting.

CAPCOM Roger. Dave, this is Houston.

SC Go ahead, Houston.

CAPCOM Roger, Dave. And just want to make sure you understood that we'd also prefer the mark on real time com as well.

SC Well, all right.

CAPCOM 15, this is Houston.

SC Go ahead.

CAPCOM Roger, Dave. Since I've hadn't heard anything I'll assume you haven't heard it.-- anything yet. Number 7 also is the R1 (garble).

SC We get the message, Joe, and (garble).

CAPCOM Okay, thank you.

SC (garble).

END OF TAPE

SC Mark, LMP.
CAPCOM Roger.
PAO And lunar module pilot Jim Irwin has seen
a light flash -
SC - CMP.
CAPCOM Rog, Al. And Al, any sensation other than
just a flash?
SC Negative, Joe.
CAPCOM Okay.
SC LMP mark. Mark CMP, mark (garbled) Mark CDR.
CAPCOM Roger.
SC Mark CDR.
CAPCOM Rog, Dave, and is it just a pinpoint or a
streak, or what?
SC All coming on the DSE, Joe.
CAPCOM Okay.
SC We can give you that but it might get confus-
ing.
SC Mark CDR.
SC Houston, so far we've all seen just point
sources of light rather than streaks.
CAPCOM Okay, Dave, and all of us are a bit -
SC Mark CMP.
CAPCOM Roger.
CAPCOM - point source we'd like a real-time voice
description of it as well as DSE recording.
SC Okay, Houston, fine. It's just that when
we're trying to talk back and forth with the time delay it's
going to get confusing on the COMM for us to try and record
mark CDR.
CAPCOM Understand, Dave.
SC Mark LMP.
CAPCOM Rog.
SC Mark LMP.
SC And Houston it did have a streak nature to it.
Like it ran from 8 o'clock over to the plus X position.
CAPCOM Rog.
SC Mark CMP.
SC Mark CMP.
SC Mark.
SC Mark CMP.
SC Mark (garbled)

END OF TAPE

SC (garble)
CAPCOM Roger.
SC Mark LMP.
CAPCOM Roger.
SC Mark CDR.
SC Mark CDR.
CAPCOM Roger.
SC Mark LMP.
CAPCOM Roger Jim.
SC Mark CMP.
CAPCOM Right on.
SC Mark LMP.
CAPCOM Roger.
SC Mark CDR.
SC Mark CDR. Mark CDR.
SC Mark CMP and again. (garble)
SC Mark CDR. Mark LMP.
SC Mark CMP.
SC Mark CMP.
SC Mark CMP.
SC Mark CMP.
SC Mark LMP.
SC Mark CMP.
SC (garble)
SC Mark CMP.
SC (garble)

END OF TAPE

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SC Mark, CMP.
SC Mark, LMP.
CAPCOM 15, this is Houston. Are you still with us?
SC (garble)
SC Mark, CMP.
CAPCOM 15, Houston. Are you still with us?
SC Roger (garble)
SC Mark, CMP.
CAPCOM Roger.
SC Mark, CMP.
SC Mark, CMP.
SC Mark, CMP.
SC Mark, LMP.
SC Mark, CDR.
SC Mark, CDR.
SC Mark CMP, Mark CDR.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/28/71, GET52:26, CDT12:59, 143/1

SC mark CDR.
SC mark CDR.
SC Mark CMP.
CAPCOM Roger, Al. And we're coming up on about 10 minutes remaining.

SC Roger.
SC Mark CDR.
SC Mark LMP.
SC Mark CDR.
SC Mark CDR.
SC Mark CDR.
SC Mark CDR.
SC Mark CDR.
SC Okay, Houston, we've got 60 minutes up here.

How's your clock look?

CAPCOM Dave, we're coming up on 60 minutes here too. And I think that's certainly an adequate period. A couple of quick questions, though. Will you describe for us briefly your positions in the spacecraft during this time?

SC Okay, we've got several comments for you, Joe. Let us uncouple here and we'll talk to you for a while about this.

CAPCOM Roger.

SC Okay, Houston, 15. I guess we realize the interest behind this and the significance of the thing and we'll each try and describe what we saw in the way of the flashes and I think because of the randomnum - randomness of the flashes, it was probably better to let us go ahead and work out the events on the DSE and I think also you'll find on the DSE when you review the tape that we've come up with a little scheme to give you some quantitative data, which may or may not be the best and if you have any suggestions on future tests or how we can make it a little better for you, we'll be glad to hear that. As to our positions in the spacecraft, we're in our launch - reenter and launch positions; I'm in the left, and Al's in the Center, and Jim's in the right. Do you still copy?

CAPCOM Roger, Dave. Loud and clear.

SC Okay, I guess, as far as my impressions I would say 90 percent of what I'd call a point source of light and to give you perhaps an analogy, you might picture yourself sitting high in the stands of the - of the Ice Capades with the arena darkened and some single figure on the Ice, like Peggy Fleming, doing a nice thing, and you look across at the other side of the dark arena and somebody shoots a flashbulb out of their instamatic or something and that would be what I'd call a typical flash of intensity five on a scale one to five and we tried to sort these out relative to their intensities. And that would be my impression of 90 percent of what I saw.

CAPCOM Roger.

SC Okay, let Al give you his impression.

SC Okay, Joe. I guess I didn't see - -

END OF TAPE

SC Okay, now I'll give you one. Here's the first one.

SC Okay, Joe, yes I guess (garble) safely.

SC (garble .and (garble) but I guess the analogy with a flash was pretty good for the brighter intensity and it seems like there was one flash maybe that was (garble) the intensity. (garble)

CAPCOM Hey, Al. -- Stand by, stand by.

CAPCOM Al we're trying to lose you because we're changing our OMNIs now. Could you stand by a second and I'll give you a call back.

SC Okay.

CAPCOM 15, while you're standing by waiting for the OMNI to come around so we can read you more clearly, Dave that was a very nice description of the flashes, of course we're very please with the -- apparently the intensity values that you put on the -- on the DSE. And I think our COMM is starting to improve here, Al. So I'll be standing by for your continued description.

SC Okay, Joe. I guess in addition to what's been said already, most of the light flashes seem to be of the order of flash cubes or the starburst that you see in the summertime. I saw very few streaks or radial paths of light. They all seem to be just point sources of light and I guess that's really about all I've got to add, Joe, I'll (garble).

CAPCOM Roger.

SC Joe, I just have one comment (garble).

CAPCOM Stand by, stand by.

CAPCOM Jim, stand by, a second. Our COMM is starting to drop out again and it may be a partial problem with your microphone position. Stand by just a second though, please.

CAPCOM Okay, Jim. We have COMM again. Proceed on.

SC Roger. I wanted to comment on one bright streak that I had just after the timing period had ended and I was about -- I was in about to take the mask off and it was a brilliant streak intensity 5 that was given from a 9 o' clock position through 12 0' clock and out to 3 o' clock.

CAPCOM Roger, Jim. We copied that. And could you tell us which eye that one was in?

SC It seemed like it went from the left eye to the right eye.

CAPCOM Okay, very interesting. Endeavour the principle investigators on this, Dick Benson and Larry Pinsky, have followed it closely and are quite pleased I think with the data that you've given us, they'll be looking at the DSE information and detail and may have some definite procedure changes to give to you later based on the information you've given us, so far. And I guess as far as we're concerned we have no more questions.

SC Okay, fine, Joe. We'll be standing by and

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SC I guess another thing that you've picked up interesting is that the flashes are quite easily located relative to either eye or the position within either eye which I think we found rather interesting.

CAPCOM That's remarkable, Dave. Right, thank you.

END OF TAPE

SC - we found it rather interesting.
CAPOCM That's remarkable Dave. Right, thank you.
CAPCOM 15, when you get squared away there, we'll be looking for your starting to charge battery B, battery Bravo.
SC Rog understand and I might have one more comment that in discussing that last one, why Jim didn't quite have that impression of localization within each eye although Al and I both do.
CAPCOM Okay.
CAPCOM Jim, this is Houston again. I have a small addition to your flight plan update which I can give you when ever convenient for you.
SC Okay, stand by.
CAPCOM Roger, whenever convenient Jim. No hurry on it at all.
SC Battery charge B is in process.
CAPCOM Roger.
SC Okay Joe. I'm ready to copy the additional comments you have for the flight plan.
CAPCOM Roger Jim. The first one is at 53 hours exactly and it's just a note for you information.
SC Go ahead.
CAPCOM roger. In the left hand side of the flight plan there, the lift off time if required, note that it is not required in this phase so we don't have to worry about that. The second change is possibly not a change, at 60 hours 6 0 hours, I wanted to double check your read back of the addition of which I gave to you earlier. And it should read at 60 hours pan camera self test off and map camera on to off. Wanted to double check that last step.
SC Roger. I have both of those Joe and they occur after the S-band aux TV off.
CAPCOM Okay, thanks very much Jim. The third change is in addition to the LM activation check list changes which I gave you earlier.
SC Is it in the activation checklist or is it in the flight plan?
CAPCOM I think you copied it in the LM activation check list on page 1-13.
SC Roger.
SC Okay. I'm on 1-13 of the activation check list.
CAPCOM Okay, Jim. After the addition on that page, which read, circuit breaker 11 EPS cabin fan closed, add circuit breaker 11 EPS DC bus volt closed.
SC Okay, copy. CP 11 EPS DC bus volt closed.
CAPCOM Okay Jim. That's it from down here for awhile.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/28/71 GET5249 CDT1322 146/1

CAPCOM 15, Houston.
SC Houston, 15 GO.
CAPCOM Roger, Dave. The next time one of you floats
past the LM CM Delta P gage could you get a readout for us
please.
SC Roger, standby.
CAPCOM Roger, no hurry.
SC 2.0.
CAPCOM Copy 2.0. Thank you.
SC Roger.
CAPCOM Apollo 15 go to POO and ACCEPT, please, for a
clock sync update.
SC All right. Roger. POO and ACCEPT.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/28/71, 13:37CDT, 53:02GET, 147/1

CAPCOM Garbled.
CAPCOM Dave is that (garbled)
SC Rog. We're within about 1200 to the mission
timer.
CAPCOM Sounds good to me.
CAPCOM Let's go noun 65 TIG.
SC Rog. I guess I should have said 12 is quitting
time.
CAPCOM Oh yes. Mercy yes.
SC Oh (garble)
CAPCOM 15, Houston. Requesting block on the up TM.
SC Oh, Rog. Thank you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/28/71 GET 5309 CDT1344 148/1

PAO This is Apollo Control. 53 hours 15 minutes
ground elapsed time. Distance and velocity now 171 365
nautical miles from earth. Velocity 3 315 feet per second.
Apollo 15 air to ground communications still live. This is
Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY.7/28/71 GET 53:27 CDT 14:01 149/1

DEAD AIR.

END OF TAPE.

APOLLO 15 MISSION COMMENTARY, 7/28/71, GET5345 CDT1421 150/1

SC Hello Houston, 15.
CAPCOM Hello, 15, this is Houston.
SC Hey, Joe I just did a Delta V and no bias check
if you want to copy the numbers.
CAPCOM Go ahead, Al.
SC Okay, the Delta V test was satisfactory. It
was a residual minus 21.0 in ten seconds and the no bias was
.8 feet in 100 seconds.
CAPCOM Okay, Al. We copy. Thank you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/28/71, 14:31CDT, 53:57GET, 151/1

CAPCOM And, Al, this is Houston.
SC Yeah, go ahead, Joe.
CAPCOM Roger. Will you be starting into your lunch
break now?
SC Affirmative.
CAPCOM Okay. That sounds like a good idea.
CAPCOM 15, Houston; If anyone by chance floats
past the LM/CM Delta P gage, we'd like another readout.
SC Okay, Joe. We'll get that for you.
CAPCOM Apollo 15, Houston.
SC Houston, 15, go ahead, Joe.
CAPCOM Roger Al. Would you tell Jim please, that
I've got a change echo to his LM activation checklist, when he
finishes with lunch and wants to copy it down. No hurry on
it, but I don't want to forget it.
SC Okay, Joe, I'll tell him.

END OF TAPE

CAPCOM 15, Houston.
SC Houston, 15 go.
CAPCOM Roger, the next time somebody goes down into
the kitchen to mix up some food could you read the Delta P
gage for us please.
SC Roger, it's 1.9.
CAPCOM Copy 1.9 thank you.
CAPCOM 15, Houston.
SC Houston, 15 go.
CAPCOM Rog, Dave. As luck would have it we lost our
comm just as we got the Delta P number from you. We copied
1.9. Verify that for us please, and also would you make sure
that the valve is still in a vent position.
SC Rog. I checked that. It's LM tunnel vent and
it's well 1.9 to 2 pretty close.
CAPCOM Okay Dave. Thank you. Just leave it in that
position.
SC Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/28/71 GET 54:27 CDT 15:01 153/1

CAPCOM 15, this is Houston. We have a further question about that LM tunnel vent valve.

SC Okay, go ahead, Joe.

CAPCOM Roger, Dave. We should have had a much greater drop in pressure during the time between these two readings. We want to confirm that you went to the DELTA-P position to read the meter this second time. Over.

SC Oh, no I thought you just wanted the reading in the LM position.

CAPCOM No sir. Apparently we have to go over to DELTA-P, get a reading, and then go - return to the vent position.

SC Yeah, that's absolutely correct, Joe. Thank you, we'll do that.

SC Okay LM CM DELTA-P it's 2.9 and then back to LM tunnel vent is 3.5.

CAPCOM Okay, Dave. We copy that, sounds so much better.

SC Yes, it sure does, doesn't it.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/28/71 GET 54:43 CDT 15:16 154/1

PAO This is Apollo Control at 54 hours 44 minutes ground elapsed time. Apollo 15 still in passive thermal control, or bar-b-cue mode in which they roll about the longitudinal axis to stabilize the thermal response or heating on the spacecraft. Scheduled to leave passive thermal control shortly after 55 hours ground elapsed time and prepare for the LM checkout and house-keeping. Present distance from earth, 174,203 nautical miles, velocity 3,254 feet per second. Air to ground circuit with the crew still up live at 54:45. This is Apollo Control.

END OF TAPE

SC Houston, 15.
CAPCOM Roger 15, go ahead.
SC Joe, I understand you have another change to the information symbols.
CAPCOM Rog, Jim, I had to change echo for you and I meant to change foxtrot already if you're ready to copy.
SC I'm ready to copy, Jim.
CAPCOM Okay, nothing very profound here. It has to do with the LM housekeeping/planing procedures I read to you at 57 plus 45. And the procedures which I read were basically a cleaning of vacuum cabin fan filter, and it involved unsnapping a netting around the cabin fan filter, running the vacuum cleaner over it, and finally replacing that netting. And we've had second thoughts about that entire procedure down here mainly because the netting is in too cramped an area to get to comfortably; it takes a long time to take the netting off and replace it and the procedure is actually not too effective anyway. So, we want you to delete this entire step and I have two more to add instead of this particular step at 57 plus 45. Am I clear so far?
SC Ah yes, you're clear so far. Do you still want us to turn the cabin fan on?
CAPCOM Roger Jim, in fact the procedure now reads like this. Before you begin the LM activation checklist and you're entering the LM, we want you to vacuum all the LM accessible areas such as velcro, places like that, where dirt and particularly glass particles have accumulated. Then, when you've cleaned it to your satisfaction, tape the vacuum cleaner to the engine cover, let it run while you're doing the rest of the housekeeping activities. Over.
SC Okay, I understand, Joe.
CAPCOM Okay Jim and then finally when you're through with the housekeeping activities, clean the vacuum cleaner inlet screen with Sticky-tape - we think you'll probably find there are glass particles there which you can remove conveniently with the Sticky-tape.
SC Okay, I copy.
CAPCOM Okay, Jim, that's all I had for you really.
SC Joe, this is 15 again.
CAPCOM Go ahead.
SC Roger, can you confirm that you still want us to turn the cabin fan on?
CAPCOM That's correct, we confirm that, we want the cabin fan turned on.
SC Okay, and as soon as we've hooked up and if we should see any glass --

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/28/71 GET 55:07 CDT 15:41 156/1

CAPCOM - - that's correct we confirm that, we want the cabin fan turned on.

SC Okay, and as soon as we - if we should see any glass on the cabin fan filter, then I suppose we should try to get down there with tape and clean it off.

CAPCOM Roger, Jim. That's right it just - we do not now want you to unsnap the netting around that cabin fan filter, in spite of what we told you earlier. It still might be possible to clean that area with sticky tape or without unsnapping the netting, no.

SC Okay, I understand.

CAPCOM Basically, I know you understand we just want as much of the glass in the LM cleaned up as you can find.

SC Okay. I think we cleaned it up pretty well yesterday, but we'll do it again.

CAPCOM Roger. Just look around it may not take much at all, today.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/28/71 GET 55:14 CDT 15:49 157/1

SC Houston.
CAPCOM 15, this is Houston.
SC Yes, Houston, go ahead.
CAPCOM I was informed that you called, did you
call?
SC Let me go to the high gain angle.
CAPCOM Stand by.
SC Yeah, we called you.
SC Houston, Apollo 15.
CAPCOM 15, go ahead.
SC Okay, we are ready to cycle the cameras now
if you've got some high gain angles for us.
CAPCOM Stand by on the high gain angles.
CAPCOM Roger 15, your high gain angles are pitch
minus 75 yaw plus 36.
SC Okay, understand. Pitch minus 75 and yaw
plus 36.
CAPCOM Plus 36 affirmative.
SC Okay, tell you what, Houston, we'll go back
to 50 degrees roll and pick up the UV for you.
CAPCOM 15, this is Houston
SC And Houston, 15, did you copy the P52.
CAPCOM Roger, we got your torquing angles, thank
you, and they say down here that you don't need to roll at
the present time. We'd just as soon save the propellant.
SC Well, we'll pick it up at the 50 degree.

END OF TAPE

SC - - well we'll pick it up at the 53 mark when we come around.

CAPCOM Okay, that will be fine.

PAO This is Apollo control. Maroon team Flight Director Milt Windler now taking over for Gerry Griffin. Going around the room talking to the various console positions. Being brought up to speed on what the next 8 hours activities will be. Meanwhile Apollo 15 is now 175 450 nautical miles from earth. Velocity now 3 227 feet per second relative to earth. Before too long the displays here in the Control center should go to moon reference data. They'll have a crossing into the lunar sphere of influence at about 63 hours 52 minutes. This is an arbitrary figure, because it's not really a line out in space that can be felt or seen. Still up live on air ground at 55 hours 25 minutes. This is Apollo control.

SC Okay, Houston, 15. Have you got telemetry we'll cycle the film on your cue.

CAPCOM Roger. Stand by, 15.

SC Rog.

CAPCOM 15, this is Houston. Before we cycle the cameras we need to stop PTC. You can either do that immediately or else go through the 50 roll and use the angle that are in your flight plan. That's your choice.

SC Oh, we'll just press on to 50 degrees, and stop there. We thought you could pick it up on the way around.

CAPCOM That will be fine. Thank you.

SC Houston, Apollo 15.

CAPCOM 15, this is Houston. Go ahead.

SC Okay, taking a look at our attitude for the UV photos we see we need a roll of 153, and your update today gave us a roll of 050 degrees. And it seems like we probably ought to stop the roll at 153 and just skip that 050 degree attitude so we can save the maneuver.

CAPCOM 15, the HIGH GAIN won't be available to us at the angle 153.

SC Okay.

SC And, Houston, 15. For future reference I guess we are to understand you cannot do the camera cycling while we're in PTC even though you have HIGH GAIN. Is that correct?

CAPCOM Dave, there are pros and cons to that. We could do it if we finessed it just right. But since it's difficult, and we have to stop rolling anyhow it's better to stop the roll this time.

SC Alright, that's true. We were just trying

APOLLO 15 MISSION COMMENTARY 7/28/71 GET 55:23:00 CDT 1556 158/2

SC to save you a maneuver. We got to stop the roll and start the roll again to get back to another spot. But, we'll go that way.

PAO This is Apollo control at 55 hours 36 minutes. We're estimating the change of shift news conference in the news center for 10 minutes from now, about 4:20 PM central daylight time. Change of shift news conference approximately 4:20 PM.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/28/71 GET 55:38:25 CDT 16:12 159/1

SC Okay, Houston, Apollo 15 standing by with
the map and pan camera on your cue.

CAPCOM Roger 15, we have a good high gain lock
on and we're GO for cycling of the cameras.

SC Houston, Apollo 15.

CAPCOM 15, this is Houston.

SC Roger, Houston, we're standing by for your
cue to cycle the map and pan camera.

CAPCOM Roger we are ready to cycle the man and . .
the pan and mapping cameras. Go ahead.

SC Okay, the map and pan cameras are coming up
now.

SC Houston, Apollo 15. That completes the
map and pan camera operation and if you're through, we'll
secure the high gain and maneuver to the UV attitude.

CAPCOM Okay, you're GO to maneuver to UV photo
attitude.

SC Okay, on the way, thank you.

PAO This is Apollo Control at 55 hours 44
minutes. The Change of Shift News Conference is ready to
begin, we'll take the air/ground off the release line and
tape for later replay.

END OF TAPE

PAO This is Apollo control at 56 hours 18 minutes. Apollo 15, now 177 110 nautical miles from earth. Velocity 3193 feet per second. We accumulated 3 minutes 37 seconds in tape during the news conference. We'll play that for you now.

CAPCOM 15, this is Houston.

SC Houston, 15. Go ahead.

CAPCOM We wonder if you can give us an estimate of how long it takes before removing the Lexad shade and getting the cardboard shade back into the window when your going to the UV transfer. We need something rough say something about 30 seconds.

SC Karl, this is 15. Looks like you just barely got started when we lost the S-band. How about saying that over again.

CAPCOM Roger. We'd like to have an estimate of how much time it takes between removal of the Lexan shade and installation of the cardboard shade when you go into the UV experiment. Something rough to say plus or minus 30 seconds.

SC Karl, we've kept the cardboard in the window up to now, we've had no need to put in the Lexan. So we can't give you a number right now.

CAPCOM Okay.

SC We will the next time we change - keep it in mind and we'll give you a number on it then.

CAPCOM Okay, we'd like to have an estimate on that when you get a chance.

SC Houston, 15.

SC Hello, Houston, 15.

CAPCOM 15, this is Houston.

SC Okay, Karl, we're through with the UV photos, and the window number 5 is still clear.

CAPCOM Thank you very much for the report.

CAPCOM 15, this is Houston. You can terminate the charge - charging of battery bravo. And when you have a moment we'd like to get a read out on the LM CM DELTA-P, and in about 20 seconds we're going to have a hand over and a loss of com for 1 minute.

SC Okay, Karl. We're terminating battery B charge now.

CAPCOM 15, we'd like to have OMNI charlie, please.

CAPCOM 15, this is Houston. We'd like to have OMNI charlie, please.

CAPCOM 15, this is Houston. How do you read?

CAPCOM 15, this is Houston.

PAO We're back live on air to ground, now. To

APOLLO 15 MISSION COMMENTARY 7/28/71 GET 56:18:00 CDT 1651 160/2

PAO clarify a couple of points in the flight plan update read to the crew late in the last shift. The start of the CSM's systems check list for the intravehicular transfer to the lunar module has been moved up from 57 hours 20 minutes to 56 hours 50 minutes. The actual IVT to the LM by the LMP and the spacecraft commander has been moved up from 58 hours 10 minutes to 57 hours 30 minutes. This will not prohibit; however, the LMP and the CDR transferring into the LM earlier if their ready to go earlier. At 56 hours 23 minutes, this is Mission Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/28/71 5624 GET 1658 CDT MC 161/1

CAPCOM 15, this is Houston, how do you read?
15, this is Houston, are you reading us? 15, this is Houston,
how do you read?

SC Rog, Houston, we'll 5 by, our LM/CM
DELTA-P is off scale high, and I wonder if you're happy with
the depress of LM and maybe we can get on with repressurizing
it and go to our housekeeping.

CAPCOM Roger 15, you have a GO to proceed.

SC Roger, thank you.

CAPCOM And Al, can you tell us how the shade on
window 5, how the hole is being blocked, do you have the
Lexan over it or do you have the camera in there?

SC Okay, we have the cardboard on it and the
metal shade behind that.

CAPCOM We copy, thank you.

SC We've been keeping the metal shade on that
window to try and keep the temperature in the cabin down a
little. When the sun's coming in the windows, it warms things
up pretty well.

CAPCOM Okay, we copy.

PAO This is Apollo Control at 56 hours, 31 minutes
The Guidance, Navigation, and Control Officer reports the
Command Module and Lunar Module cabin pressures are now
equalized.

CAPCOM 15, this is Houston. If you would go to a
5 degree min-dead band, they down here we might save a little
bit of propellant.

SC Roger.

CAPCOM 15, this is Houston, if you've got a little
cryo press light up there, we see that down here and that's
expected at the moment.

SC Okay, thank you.

PAO This is Apollo Control at 56 hours, 52 minutes
Apollo 15 is 178 180 nautical miles from earth, velocity
3171 feet per second. The crew is busy now making preparations
to enter the lunar module. We'll continue to stand by live
for any air/ground.

PAO This is Apollo Control at 57 hours, 2 minutes.
Telemetry shows power on the LM now and we've just had
acquisition of LM data on telemetry now.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/28/71 GET 57:03:00 CDT 17:37 162/1

SC Houston, 15.
CAPCOM Go ahead, 15.
SC Roger, Houston, the Falcon's all set up for data and want to know you are getting it.
CAPCOM Roger. We're getting data from Falcon.
SC Rog.
SC Houston, 15.
CAPCOM Go ahead, 15.
SC Okay, if you'll let me know when you've gotten enough data from Falcon and I can tell Jim to power that down.
CAPCOM Roger, Al. Standby.
PAO That's Al Worden communicating from the Endeavour to CAPCOM Karl Henize.
CAPCOM 15, this is Houston. The batteries in the SHE all look to be in excellent shape and we're ready to secure the instrumentation, then go ahead to page 1-18.
SC Rog, understand, Houston. We go into 1-18.
Thank you.
CAPCOM 15, Houston. Is it possible to get the ED batt readings?
SC Standby 1, Houston.
SC Houston, the ED batteries are reading 37 on both.
CAPCOM Thank you.
SC Roger.
PAO This is Apollo Control. SHE is a synchronym for super critical helium, which is used to pressurize the decent propulsion tanks on the lunar module.
CAPCOM 15, this is Houston. Would you please put 02 heaters 1, 2, and 3 all to AUTO.
SC Rog, Karl. 02 heaters 1, 2, and 3, on AUTO.
CAPCOM Thank you.
SC Houston, 15.
CAPCOM 15, go ahead.
SC Rog, Karl, looks like the LM checkout is coming along pretty good. We've checked out all the batteries now. When do you want us to start in the PTC?
CAPCOM Rog, Al. We want to get a few minutes, about 5 minutes of SIM Bay data there at 15:45 in your flight plan and then we can go into PTC.
SC Houston, 15.
CAPCOM Go ahead, Al.
SC Okay, Karl. If you're ready we'll give you the SIM Bay data now.
CAPCOM Hang on just 1 or 2 minutes. We're not completely set up down here.
SC Okay.

APOLLO 15 MISSION COMMENTARY 7/28/71 GET 57:03:00 CDT 17:37 162/2

CAPCOM Al, we're ready for the SIM Bay data.
SC Okay, Karl. Coming your way.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/28/71 CST1815 GET57:41:00 163/1

CAPCOM 15, Houston. We'd like to have you turn 02 heaters 1 and 2 off at this time and leave number 3 on auto.

SC Okay Houston, coming off with 1 and 2 and leaving 3 in auto.

CAPCOM Very good. 15, this is Houston we have enough SIMBAY data and you can terminate that procedure, and we're ready then to go into PTC and we would like alpha and delta for damping and bravo and delta for spin up.

SC Okay Houston 15, understand you've got enough SIMBAY data so we'll turn it off, going into PTC and using alpha and delta for damping and bravo and delta for spin up.

CAPCOM That's correct.

PAO This is Apollo Control at 57 hours 48 minutes. Command module pilot Al Worden will spin up the spacecraft now to reestablish passive thermal control mode. It'll take sometime to determine whether we've achieved the proper rate of 3 tenths of a degree per second. Dave Scott and Jim Irwin will remain in the lunar module performing their housekeeping chores while Al Worden establishes PTC. We don't expect to hear from the spacecraft commander or the lunar module pilot until they do return to the command module. At 57 hours 49 minutes, this is Mission Control, Houston.

CAPCOM 15, this is Houston. How are we coming along on closing up the LM?

SC Houston, 15, we're coming along, taking our time doing it though while we're getting going on PTC.

CAPCOM Hey Ed.

SC We'll be a few more minutes stabilizing the rates here for the PTC until we get all the dumps done.

CAPCOM Roger and be advised that we're prepared to read up a fairly extensive revision to the SPS burns and we'd like for you guys to let us know when you're ready to discuss it and copy it.

SC Okay, Karl. It'll be a while yet.

PAO This is Apollo Control at 57 hours 57 minutes. Apollo 15 now 180,124 nautical miles from earth. Velocity 3,131 feet per second.

SC Houston, 15.

CAPCOM Go ahead, 15.

SC Okay, Karl, how do the rates look to you now?

CAPCOM Okay, they - okay Al, they look good to us. You can go ahead and spin her up.

SC Okay, Karl.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/28/71 GET 58:15:00 CDT 1848 164/1

CAPCOM 15, we'd like to have OMNI bravo, please.
SC OMNI bravo.
PAO This is Apollo control at 58 hours 43 minutes. Apollo 15 now 181 521 nautical miles away from the earth. Velocity 3 103 feet per second. We'll continue to stand by live to monitor any air ground.
CAPCOM Al, this is Houston. Could we have HIGH GAIN manual and wide.
SC Roger. Stand by.
CAPCOM We don't want to bring it up. We simply want to select manual and wide.
SC Okay, you have it.
CAPCOM Thank you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/28/71 5855 GET 1929 CDT MC165/1

SC Houston, Apollo 15.
CAPCOM 15, this is Houston.
SC Rog, we're all up on the comm and ready to talk about the SPS.
CAPCOM Roger Al, Dick Gordon's here and he's been involved in hashing all of this out and I'd like to have him read it up to you and argue with you about it.
SC I'll do that. Go ahead, Richard.
CAPCOM Hello Dave, no argument, what are you doing way out there?
SC Oh, we're just sorta checking out the old LM, taking a look at the pretty scenery.
CAPCOM Okay, listen we've been, as you might guess, been talking a great deal about P40 procedures, and we do have some changes to talk to you about if you've got your G&N dictionary handy and page 5-1 where the P40 thrusting goes I'd like to go ahead and go through it and discuss it with you.
SC Okay, let's pull it out, Dick.
SC Okay, we've got 5-1 out, go.
CAPCOM Okay, Dave, right below the Verify the Sim Power Down line there, I'd like you to insert two lines. Circuit breakers, SPS pilot valves, two of them open. That should be a verify.
SC Okay, should be SPS pilot valve two open verify.
CAPCOM And then the next line would be circuit breakers EPS, Group 5, two of them closed, verify.
SC Okay, should be EPS, Group 5, two closed, verify.
CAPCOM Okay, right there in the same column, underneath test caution and warning lamps, insert EMS function Off, Verify.
SC Okay, beneath test, caution and warning lamps, EMS function off, verify.
CAPCOM Roger, and then the next line would be circuit breaker EMS Main A and B two of them closed.
SC Okay, CB EMS A and B both closed.
CAPCOM Okay, Dave, that will finish up that page, next comments on page 5-2, where it starts in with a TVC check and prep, second line Circuit breakers SPS 10 vice 12 closed.
SC Okay, understand, CBSPS vice closed, and those are the two pilot valves?
CAPCOM That's affirmative. Okay, page 5-3 at the two minute point, 58 with 2 minutes in parentheses, I'd like for you to scratch the line that says "Delta V thrust A paren B normal" and substitute "Circuit breaker SPS pilot valve main B closed".
SC Okay, CB SPS pilot valve main B closed instead of the delta V thrust A and B to normal.

APOLLO 15 MISSION COMMENTARY 7/28/71 58:55 GET 19:29 CDT MC165/2

CAPCOM Okay

CAPCOM Okay, go ahead, we got it, okay we got
an OMNI switch, just hang on. Okay, Dave, the next one
is on page 5-4 and its an insert, when you get the flashing
99, below the line that says "Pro at TFI greater than zero
seconds", insert "Delta V thrust A and B, 2 of them to
normal", and we'll come back and discuss that in a minute.

END OF TAPE

CAPCOM Okay, Dave, did you get that Delta-V thrust A and B 2 of them to normal right after the pro at the flashing 99.

SC No, we lost you on the COMM there, Dick. At minus 2 minutes and we verified that we scratched the Delta-V thrust A or B to normal and substituted CB SPS pilot valve main B closed. That's the last we heard from you.

CAPCOM Okay. On page 5-4. I was just talking about that one where you get to flashing 99, and the line where it says pro at TFI greater than zero seconds. Under that line insert Delta-V thrust A and B, 2 of them to normal and I'm sure we'd want to discuss this in a little bit.

SC Yeah, it sounds like it. Okay, after auto ignition pro at TFI greater than 7 - greater than zero seconds, insert Delta-V thrust - did you mean A or B or do you mean A and B normal.

CAPCOM I mean at this time A and B and we'll talk about different burns on this very subject a little later.

SC Okay. A and B normal.

CAPCOM Okay, down the next paragraph where it's got the 0640 and the emergency procedures for the flashing 9740 for the SPS thrust fail. Scratch the line that reads Delta-V thrust B (A normal) and insert circuit breaker SPS pilot valve main A closed.

SC Okay. Standby 1.

SC Okay, on the flashing 97, scratch Delta-V thrust B (A normal) and insert CB SPS pilot valve B closed.

CAPCOM That was SPS pilot valve main A closed.

SC That right?

CAPCOM That was main A closed, Dave.

SC Okay, main. Rog, sorry about that, main A closed, right.

CAPCOM Okay, what we're saying if you don't get an ignition on B we want you to go ahead and use A.

SC Okay.

CAPCOM Okay, the next change is at 3 seconds, scratch the line that says Delta-V thrust B (A normal) and insert circuit breaker SPS pilot valve main A closed.

SC Okay, at 3 seconds scratch Delta-V thrust B (A normal) and insert CB SPS pilot valve main A closed.

CAPCOM Okay, at the bottom of the page, this is applicable to LOI only. And at 6 minutes into the burn we want to line circuit breakers SPS pilot valve main A open.

SC Okay, at 6 minutes into the burn SPS pilot valve main A open.

CAPCOM Okay, and then a note there for Jim. At that point we no longer want any PUGS manipulation for fuel valves.

SC Okay, understand. No PUGS after 6 minutes.
CAPCOM Okay, we'll talk about the reason for that in a second. I've got one more line in your P40 checklist and then we can discuss some things. On page 5-5, it's in the clean up column there, about half way - almost to the pro underneath the line that reads circuit breakers SPS pitch 1 and yaw 1 open, insert circuit breakers SPS pilot valve main B open.

SC Beneath CB SPS pitch 1 yaw 1 open, insert CB SPS pilot valve main B open.

CAPCOM Okay, that cleans up the checklist items. Take the easy one first. And the reason we want to secure bank A during the LOI burn at 6 minutes is so we can get a handle on the single bank performance and we anticipate making all of the other burns with the good bank, bank B, with the exception of TEI.

SC Okay, that makes sense.

CAPCOM Okay, and I guess the other things we might talk about just briefly is that the procedures that we just gave to you are for LOI. For midcourse 4 and DOI we'll use the same procedures but we'll do it on bank B only, single bank burn, we'll use the good bank, and we won't do anything with the pilot valve for main A or the Delta-V thrust A. We'll just go ahead and do these procedures but not use bank A at all.

SC Okay, understand. We'll use dual bank for LOI and TEI and all other burns will be on bank B, only, with no manipulation of the Delta-V thrust A switch.

CAPCOM Okay, and after we do our LOI and DOI we should have some real good visibility into bank B and for Al's planning when he's up there by himself for the circ and plane change burns, we'll use normal procedures. The old procedures Delta-V thrust B normal at TIG minus 2 minutes with the exception that we will make those burns single bank and we will not attempt to use bank A.

SC Oh, okay, we'll then we've got three groups and with Al soloing he's going to use single bank B just like he's always done with the circuit breakers with CB SPS pilot valve B in at the beginning of the procedures. Is that right?

CAPCOM That's correct. And for TEI, the only changeable part makes the procedure we just passed we'll probably let bank A, we'll probably leave bank A in the burn until we get down to about 5 seconds to go and the reason for this if something happens to the banks then we're within our RCS capability for midcourses.

SC Okay. I guess - we can press on here, but we'll probably talk it over with you before each burn anyway, too.

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CAPCOM Yes, I'm sure we will and I guess the thing to talk about now is our reasoning, our thought processes on having you proceed at 5 seconds and then having Al throw on both the Delta-V thrust switches right after that, and let me go through it and let you think about it then. The reason we want to do that now even though we do have a great deal of confidence in bank B - -

END OF TAPE

CAPCOM - - about then. The reason we want to do that now, even though we do have a great deal of confidence in bank B. But the SPS engine thrust light we have no visibility into that system as long as that light is on. And if for some reason since we do have this suspect system, here in A we don't want to take the chance with B, and when that thing fires off we want you to be on a good guidance. You won't have to do anything as far as your guidance is concerned. You can continue the burn, and press on even though it may have ignited prematurely. It does require procedure change and I think you and Al think about how you might handle this, and come back to us. But those are the reasons we did want to turn either DELTA-V thrust on earlier and the point where you'll get good G&N guided burns.

SC Okay. That sounds like you been doing some good deep thinking on it all. That's pretty well, Dick.

CAPCOM Okay, Dave. We'll let you guys think about those - hang on.

CAPCOM 15, Houston.

CAPCOM 15, Houston.

CAPCOM 15, Houston.

SC Okay, we got signal strength back, also, Dick. Go ahead.

CAPCOM Okay, Dave. I guess we might talk about MCC 4 just a little bit. We haven't really gone into this too deeply.

SC Okay.

CAPCOM We haven't gone into MCC 4 too deeply, yet. Right now it looks like it's DELTA-V of about 4.2 and our intentions are at this moment to make that single bank burn, but bank bravo. And if something happens there we're looking at possibly finishing that up with RCS. But we're not definite on that, and just wanted you kind of have a feel for it.

SC Okay, that makes sense. I guess we've got one point, here, and looking at the post ignition sequence on the LOI burn. In order to monitor start transients and retain Al's capability to take over in case we have a gimbal hardover at start, or something like that. Perhaps it might be better to push that circuit breaker - the SPS pilot valve main A closed as soon as we get ignition, and then that would enable Al to get back over in the THC in case he's got a problem there. How about that?

CAPCOM Okay, we did discuss that little bit down here about that time. We felt that we'd like to have the engines stable out - stabilize out to guidance and the engine on bank B before he even goes over and tries to get that pilot valve circuit breaker in. That will give us visibility on the DSE dump on how bank B is performing.

SC Okay, then why don't we move it in sometime past 3 seconds a little later. How would that fit you?

CAPCOM Well, we discussed that one too, and 5 seconds was used. What would you like?

SC Well 5 seconds sounds a tad better than 3 and it gives us a chance to get stable in here, and gives Al a chance to take a look at what kind of start transients we got.

CAPCOM Okay, Dave. I guess our discussion around here. We had proposed vital at one time and it was a change to your normal procedures of putting the other bank on. So I guess it's really your choice in this regard, 5 seconds is just as good as 3.

SC Yes, Okay. Well, Al made the point that it's all changed anyway because normally I bring on bank - the second bank in 3 seconds and he doesn't have to worry about it. He's concentrating on the start transients and everything. So it's a complete change at any rate, and I think it might be a tad better to go to the 5 seconds with Al on the circuit breaker.

CAPCOM Okay, that sounds good to us. Yes, Dave the point is being made that it can be even longer than that if you really feel like you need it.

SC Okay, well we'll shoot for 5 seconds and if Al feels uncomfortable about the start transients, and wants to hang on to the T handle I think that ought to be his option.

CAPCOM I couldn't agree more.

SC Okay.

CAPCOM Okay. Karl's got some things here, I guess, on the LEB lighting and stuff and my question to Al is how he wants to handle the timing if he doesn't have that LEB timer for P24's and those good things that he is doing.

SC He's thinking. Just a minute.

CAPCOM Okay. We don't need an answer now. Karl's got some things on that. We can use this as a discussion period, I guess.

SC Okay.

CAPCOM Dave, I'm going to go get dinner. We'll talk to you later.

SC Oh, okay. Thanks a lot Dick, appreciate it.

CAPCOM Okay. We'll be looking at you.

SC Good.

END OF TAPE

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PAO This is Apollo Control at 59 hours 20 minutes. That was astronaut, Dick Gordon, commander of the back up crew for Apollo 15, passing up to Dave Scott changes in procedures for the service propulsion system maneuvers. The P40 checklist he referred to, P40 is the SPS thrusting program in the computer.

SC Houston, 15.

CAPCOM 15, go ahead.

SC Okay, we're standing by for the rest of the comments you may have on the circuit breaker at all.

CAPCOM Roger, we'll be with you in just a couple of minutes.

PAO This is Apollo Control. It appears that Dave Scott, and Jim Irwin spent about 2 hours in the lunar module. We copied the start of LM data as 57 hours 2 minutes, and the first call from Dave Scott back in the command module came at 58 hours 57 minutes. We'll continue to stand by live for more air to ground. Capcom Karl Henize is waiting to pass up some more information to the crew shortly. At 59 hours 26 minutes this is Mission Control, Houston.

CAPCOM 15, this is Houston.

SC Houston, 15, go.

CAPCOM Just a quick note on the circuit breaker on the illumination, and then a procedure that might clarify a couple of things for us. First of all, there's a number of numeric and electro-luminescent lights that are out, but we won't go into all of that. The main thing is the panel 122 DSKY down there. The a... As far as we can see at the moment there is some possibility that we still have illumination on your status lights on that DSKY and if we go through a small procedures here we might find out whether or not there will be illumination on it. Stand by.

CAPCOM 15, this is Houston, are you reading. 15, this is Houston.

END OF TAPE

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CAPCOM 15, This is Houston.

SC Go ahead, Karl.

CAPCOM Right, back to our lighting circuit breaker. Let me emphasis two main points to start with. I guess under no circumstances do we want to close that circuit breaker, and a second problem is a . . . a second point is that we don't want to change the intergal lighting or the numerics lighting rheostats on panel 100. Let's leave them just as they are. And then there's the . . . there is a possibility due to the fact that there is a very low amperage shunt going around that circuit breaker, there is a possibility that we do have lights on the DSKY status lights, that is the up-link activity lights, etc., and if we can go through a quick procedure here we'll find out whether or not we do have lights there. Shall we go ahead?

SC Okay, go ahead, Karl, we'll take a look at it.

CAPCOM Okay, first of all on panel 100, again making sure that we do not change the numerics and integral lighting switches, can you tell us the position of those two switches, those two rheostats?

SC Okay, we'll tape them into position they are right now.

SC Houston, 15.

CAPCOM Go ahead. 15, This is Houston, go ahead.

SC Okay, Houston, we just did a little check-out for your LEB DSKY and the key release light doesn't work for one, does not work.

CAPCOM Roger, I guess you are a couple of steps ahead of us there, can you tell us the position of the numerics knob over on panel 100?

SC About 2:00 oclock.

CAPCOM Roger, I guess that's . . . that's one of our weak points, if - if that switch had . . . if that knob had been over close to full bright, we had some chance of getting enough energy into those lights to make them work, but in that position, that's probably not possible, and we should leave things as they are.

SC Well, well I'm not sure those integral lighting rheostats have not been moved since the circuit breaker popped. I guess if you want to we could run it over to full bright or I guess you probably prefer to leave it as it is, and if so, we'll give up on the status lights.

CAPCOM The word at the present time is, let's leave them just as they are, Dave.

SC Okay, we'll put a piece of tape across so we don't accidentally run into them.

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CAPCOM Okay. That's all we have on that subject, 15. You probably know as well as we what lights you're missing up there, we could give you a list if you would like.

SC Oh, no, we got a good handle on, Karl. Thank you.

CAPCOM Roger.

CAPCOM 15, This is Houston.

SC Go ahead.

CAPCOM I've got one small comment for you, and then a small update to flight plan. First of all, they've gone through a very thorough test on the range rate meter and how it operates under those pressures and in that pure oxygen atmosphere, and so far as we can see at the present time, there is no problems whatever in its operation, but we'll continue that test. In the Flight Plan at 60 hours on the Sim Bay procedure to get some data from the cameras there, I have a small change, if you have the Flight plan out.

SC All right, go ahead, Karl.

CAPCOM Right, that procedure should go in this order, first the S-Band AUX TV to science as its already there, then the pan camera power ON for 5 minutes, and then OFF, after the power goes OFF wait for a MSFN cue because we want to pick up some data in that, in that state as well. After you get a MSFN cue, then we go to the pan camera soft test off, the mapping camera on switch to off and then the S-band auxillary TV OFF, in that order, and we are going to need the high gain antenna for this job and we are going to have a pitch minus 30 and a yaw of 90 and we're going to have to give you cue as to when to start this, so that everything will be lined up right.

END OF TAPE

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SC Okay, we copied all that.
SC Houston, we copied that.
CAPCOM Roger. And when we come close to the right time, let us know when you're ready to start and then we'll let you know when we're ready.
SC 15, Roger.
PAO Those last few exchanges have been with Jim Irwin.
SC Karl, this is 15. We're ready to do that now, or whenever you're ready.
SC Houston, this is 15.
CAPCOM 15, we copied, and standby within 1 or 2 minutes we'll be able to give you a GO.
SC Roger.
CAPCOM 15, this is Houston. It looks like we have a 2 to 3 minute wait yet.
SC Roger.
CAPCOM 15, this is Houston. You're GO to turn on the pan camera telemetry. We need to bring up the high gain antenna and then turn on the pan camera telemetry.
SC Roger, we copied.
SC Pan camera power is on now.
CAPCOM We copy.
CAPCOM 15, this is Houston, we're ready for the pan camera power switch to off.
SC Oh, very well, pan camera power is coming off.
SC Pan camera power is off.
CAPCOM 15, Houston. You can proceed with the rest of that procedure.
SC Roger. In work.
CAPCOM 15, we'd like to have Omni Bravo.
CAPCOM 15, this is Houston.
SC Houston, 15. Go.
CAPCOM At your convenience give us the wide beam on the high gain antenna. And the system down here says that your PTC is excellent, in fact it's one of the best they've ever seen.
SC Oh, very good. Okay, you want high gain wide beam.
CAPCOM That's affirmative.
SC Okay.
CAPCOM We don't want to bring up high gain, we just want to select wide and manual.
SC Oh, okay, okay, we'll do that.
PAO This is Apollo Control. Apollo 15 now 184,029 nautical miles from earth. Velocity 3,055 feet per second. The recent discussion on the circuit breaker and the lighting

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PAO in the Command Module that is the circuit breaker that popped open last night. The DSKY they were referring to - the lighting in the DSKY - is the display in keyboard in the computer in the lower equipment bay. The DSKY on the main panel in the Command Module is not affected.

PAO The crew apparently found nothing amiss in the Lunar Module during this latest visit. Flight plan calls for negative reporting, that is, if something is different from the normal they will report it, otherwise they will not. They haven't reported anything concerning the Lunar Module housekeeping. We did monitor by telemetry the LM systems for a period of 5 minutes. Early right soon after the crew had gone into the LM. All the LM Flight Controllers reported the systems looked very good. At 60 hours 11 minutes, this is Mission Control, Houston.

END OF TAPE

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CAPCOM 15, this is Houston. How are we set for the bistatic radar frequency check.

SC We're just about ready for it.

CAPCOM Okay, we're about ready down here too. Let us know when your, go.

SC Roger.

SC Okay, we're configured.

SC Houston, this is 15. We're all configured up here.

CAPCOM Roger, we copy and stand by.

CAPCOM 15, we're turning off the uplink, now.

SC Roger.

CAPCOM 15, this is Houston. How do you read?

CAPCOM 15, this is Houston. How do you read?

SC Five square, Houston.

CAPCOM Good, it sounds like we've got our uplink going again. That next bit down there about ground cue it'll be about 20 minutes before we can get down to that.

SC Okay, we'll be standing by.

PAO This is Apollo control at 60 hours 49 minutes. Apollo 15 now 185 078 nautical miles from earth. Velocity 3 035 feet per second.

END OF TAPE

CAPCOM 15, this is Houston.
SC Houston, 15.
CAPCOM I guess we've got all the data we need down here. You can go ahead and turn the VHF off.
SC Roger let me check.
CAPCOM 15, this is Houston.
SC Houston, 15, go.
CAPCOM Looks like a very quiet night tonight. About the only question we've got for you at the present time is your assessment of the glass clean up. How did it go?
SC Well we got a few more pieces just by looking around over there. Some of the smaller are like, oh I guess the largest piece we found was about a centimeter or so, and the vacuum cleaner picked up a bunch of small chips. I guess in total we may have 60 or 70 percent of the portion that broke, and I think we've really picked up all that is practical at this stage.
CAPCOM Any special places this stuff seems to collect that you can tell?
SC I think initially, we've found most of it was up near the COAS mount and behind the panel on the left side near the forward part of the window. We found several larger pieces there and also one large piece just above the data file which was about an inch long or so. Now the small pieces seem to have been drifting all around.
CAPCOM Roger. And 15, we didn't forget your state vector. It's just that the one you've got on board is very good. We don't need, we feel that we don't need an update.
SC Okay.
CAPCOM Just polishing off a hamburger and french fries down here. What's on the menu up there tonight?
SC Oh, stand by a minute Karl.
SC Hey Houston, 15.
CAPCOM 15, go ahead.
SC Okay we're just getting ready to do some chlorination here and we find we've got a leak around the chlorine port with a cap on it and it seems to be leaking water, and you might take a look at that real quick and see if you can come up with any ideas on it. The cap is on and Jim was just getting ready to take the cap off and noticed a little water, and in trying to clean it up it seems like we're accumulating a fair size, fair amount of water right now, right around the cap.
CAPCOM Can you give us an estimate of how many drips per second it is?
SC Yea, it's a pretty good flow right now. Drips per second, is hard to measure. It's a whole ball of

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SC water right around that valve right now.

CAPCOM Rog -

SC What we need is a check valve that we can close or get to to isolate that port if we could get one.

CAPCOM Dave, I had a problem when I chlorinated on launch day, and when I first took the valve off I had about what you've got, quite a strong flow. The cap stops it from flowing when you put it back on and after I chlorinated, the flow decreased down to a very slow drip, say once a minute.

SC This is a big run, Karl, and the cap is on tight and you can almost feel something flowing beneath the cap.

CAPCOM Okay stand by. Lots of people thinking down here now.

END OF TAPE

SC Houston, 15. It seems to be leaking from behind that panel there, right behind where the waste tank servicing valve is, and the potable tank inlet, and its accumulating at a pretty good rate.

CAPCOM We copy.

SC Houston, 15. Got any suggestions yet, we need to isolate this thing pretty quick.

CAPCOM Just a minute. What was . . .

CAPCOM 15, This is Houston, our recommendation is that on 351 you turn the water and glycol tanks pressure regulator off, on 352 turn the potable tank inlet off.

SC Okay, potable tank inlet is now closed and say again the other one.

CAPCOM Up on panel 351, water and glycol tanks pressure regulator off.

SC Okay, water and glycol tanks pressure regulator is off.

CAPCOM 15, Houston. That should . . . that should have taken the pressure off the potable water tank, is it helping the situation any?

SC No, it's still leaking, Karl, pretty good rate.

CAPCOM Roger, stand by.

SC Houston, it looks like maybe we ought to start dumping out of the waste so we can dump out of the potable tanks, it's still leaking and we got everything but the check valve between the potable tank and the chlorine nozzle isolated.

CAPCOM We copy, Dave. No comments yet, stand by.

CAPCOM 15, Houston. We note the pressure in your tank coming down, in the meantime, we suspect that the . . . we suspect that the fitting there on your chlorine injector outlet is loose and we have a . . . we have a procedure here for tightening it up.

SC Okay, give it, quick.

CAPCOM Roger, we need tool number 3 and tool number W out of the tool kit.

SC Okay, 3 and W out of the tool kit.

CAPCOM Right, put number 3 in the tool W ratchet and insert tool 3 in the hex opening in the chlorine injector port.

SC Okay, that looks like where it's probably leaking.

CAPCOM And once we have the number 3 tool in the hex opening, it should go in about a quarter of an inch to really engage, it also says "use caution when inserting the tool because it comes in contact with a rubber

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CAPCOM diaphragm".

SC Okay.

CAPCOM We've agreed down here it's a good idea to
take the water gun to fill up a food bag or something of
that sort.

SC Okay.

CAPCOM Once you've got tool number 3 well engaged
in that injection port, turn it about a quarter of a turn.

END OF TAPE

SC Okay, Houston. It looks like that did it.
CAPCOM Wonderful.
SC Nice to have the quick response you guys have
down there.
CAPCOM Well, you'll never believe it but after we
had the leakage on the morning of the 26th somebody sat down
and wrote up a special procedure just in case.
SC Well, that was good thinking because we about
had a small flood up here.
CAPCOM 15, Houston. We're looking now at the best
procedure for getting the water system operating again and
in the meantime we trust you have your hands full of water
up there.
SC Oh, yeah. All we have to do now is hang out
a few towels to dry, but it looks like we're in good shape.
CAPCOM Very good.
CAPCOM 15, Houston. We'd like for you to turn the
regulator back on on panel 351.
SC Okay. Regulator turned back on.
CAPCOM 15, Houston. Is everything looking all right
on the leak now?
SC Yeah, it looks okay. That fitting there that
we tightened up went somewhere between 180 to 170 degrees
to a turn. And that was where the water was coming from and
it looks like it's secure now.
CAPCOM We copy.
SC Karl, we just ran a little check with our
slide rule here and it was something like 3000 drips per
minute.
CAPCOM Okay, glad to hear that good news. I guess
up there you don't get drips do you. That's an interesting
fact.
SC Rog.
CAPCOM Okay, Dave, we're ready to open the inlet
valve to the potable water tank.
SC Okay, potable water inlet coming open.
CAPCOM Incidentally Dick was over at Lurton's and they
called up to say "Hey, it's about time you take a bath up
there".
SC Well, we were sort of discussing that a little
earlier tonight anyway. And as a result, well I guess we all
got cleaned up.
CAPCOM Good enough.
SC And Houston, with the fitting secure now and
everything ship shape what do you think about proceeding ahead
with the chlorination.
CAPCOM Okay, Dave, go ahead.

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SC Houston, 15.
CAPCOM 15, this is Houston. The word here is to
go ahead.
SC Houston, 15.
CAPCOM 15, this is Houston. Are we in COMM now?
SC Rog. We've got you. When - everything
looking ship shape down here what do you think about proceeding
with the chlorination?
CAPCOM Okay, Dave, go ahead.
SC All righty.
PAO This is Apollo Control at 61 hours 41 minutes.
That inflight repair of the chlorination port on the water
tank was accomplished with 2 tools in the onboard tool kit.
Tool 3 that you heard reference to is a hexagonal allen wrench.
Tool W is a rachet that fits on to provide leverage for the
wrench.

END OF TAPE

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CAPCOM 15, this is Houston. Is Jim doing some exercising now? We're doing a little medical detective work down here.

SC Well yes, as a matter of fact he is. He's trying to get one of the compartments open.

CAPCOM Roger. CAPCOM's with you.

SC Houston, 15, go ahead.

CAPCOM 15, this is Houston. Please disregard.

SC Okay, I'll disregard.

PAO This is Apollo Control at 61 hours 54 minutes. Apollo 15 now 187,163 nautical miles from earth. Velocity, 2,995 feet per second.

PAO This is Apollo Control at 62 hours 4 minutes. Apollo 15 is 187,464 nautical miles from earth, velocity, 2,990 feet per second. To recap the water tank problem, at 61 hours 15 minutes Dave Scott reported a leak in the chlorination port of the water tank, just as he was getting ready to chlorinate the water for the evening. He reported it was a pretty good leak. Water was balling up around the port fairly rapidly. We had the crew close some pressure regulators to relieve the pressure inside the tank to slow the leak, then passed up a procedure involving the use of 2 of the tools in the on board tool kit. To the best recollection of people in the control center at the present time, this is the first in flight use of the tool kit for something like this. With these 2 tools identified as tool 3 and tool W, tool 3 is an allen wrench, hexagonal wrench, tool W is a ratchet which enables the crewmen to get the proper leverage on the wrench. With these tools they were able to tighten the chlorination port, and stop the leak. The crew reports that this procedure was successful. They're not having a problem with the leak at this time. They're apparently mopped up the water that did leak out of the tank. Dave Scott reported that they'd had a few towels hanging up to dry but other than that he didn't see any problem. At 62 hours 7 minutes this is Mission Control, Houston.

END OF TAPE

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SC Houston, Apollo 15.
CAPCOM 15, go ahead.
SC Okay, we've got the presleep checklist if your ready to copy.
CAPCOM Go ahead, Dave.
SC Okay crew status is good. No medication today. Onboard readouts batt c 37.0 pyro batt A 37.2, B 37.2, RCSA 89, B 86, C 89, and D 86. And the H2 fans have been cycled and the potable water has been chlorinated, and the vents and switches are all set. The cabin is at 5.7 and I'll give you an E memory dump any time your ready.
CAPCOM We copy and stand by on memory dump.
SC Okay, you might be interested in another little item. All the meals have been consumed on schedule, and the pantrys even had a pretty rigid test so far.
CAPCOM Excellent.
SC And our trusty LMP came up with an interesting analogy relative to the last event. He wondered if the original Endeavor had ever spun a leak like that.
CAPCOM Okay, that's a good question. We'll our historians out to check that one.
CAPCOM Hey what did you do with all that extra water. Stick it over board or drink it or what.
SC Oh no, we've got a bunch of towels hanging up in the tunnel, right now. It looks like somebody's laundry.
CAPCOM Sy's down here guessing that you hosed some of it overboard.
SC Well you probably saw motion of the spacecraft. We were just in that process when you came up with a procedure.
CAPCOM Okay, fine. The PTC's still looking great.
SC Oh, good.
CAPCOM Okay, Dave we're ready for the E mod dump.
SC Okay, here it comes.
CAPCOM 15, Houston. We finished the E memory dump. The surgeon says that it is your turn in that biomed harness. And otherwise we don't have anything more down here. And we're ready to secure the voice communications anytime you like.
SC Okay, very well. By the way how are your biomed harnesses working out for the surgeons.
CAPCOM The word is, we're getting good clean data, and they're very happy with it.
SC Okay, very well. See you in the morning.
CAPCOM Roger. Good night.
PAO This is Apollo control at 62 hours 21 minutes. We have secured voice communications with Apollo 15, now. Do not expect any more air ground conservations tonight

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PAO Apollo 15, now 187 962 nautical miles
from earth, velocity 2981. We'll take the air ground line
now. If there are any more conversations we'll come back
up. At 62 hours 22 minutes this is Mission Control, Houston.

END OF TAPE

PAO This Apollo Control at 63 hours 8 minutes. Flight director Glenn Lenney and his team of flight controllers are preparing to relieve the Marune team headed by flight director Milton Windler. There will be no change of shift briefing following this shift change. The next change of shift briefing is estimated for 7:15 a.m. central daylight time. We'll summarize the activities during this past 8 hours that the marune team has been on duty. Spacecraft was taken out of the passive thermo control mode shortly after this team came on duty and command module pilot Al Worden completed a series of ultraviolet photographs of the earth. Shortly after that the spacecraft commander Dave Scott and the lunar module pilot Jim Irwin entered the LM for the second time during this mission. We did not have communication with the LM and the crew did not give us time ax on entering or leaving the LM, however from the best ques that we do have we believe they spent approximately 2 hours in the LM. We saw the first LM data at 57 hours and 2 minutes, which would indicate that, we think they powered up soon after entering at that time. We took data for only about 5 minutes and the flight controllers monitoring LM systems reported they all looked good. The batteries are good. The super critical helium pressures are good. The other cryogenic consumables look good on the LM. We had a call from Dave Scott at 58 hours 57 minutes when he was back in the command module. So it appeared that him and Jim Irwin spent about 2 hours in the LM performing housekeeping and inspection chores. They reported later that they did find a few more pieces of glass from the shattered outer pane of the tape meter, that was first reported yesterday, last night during the first transferring of the LM. They picked up a few pieces acentimeter or so. And then with the vacuum cleaner picked up some smaller chips. They believe they've collected up to 70 percent of the glass, they've gotten all that is practical. They commented most of the glass appeared to be concentrated near the crew optical alinements sight and up around the panel on the left side of the cockpit and that the very tiny pieces, the small pieces were drifting about. Shortly after we heard from Dave Scott, when they returned to the command module, the backup crew commander, astronaut Dick Gordon, passed up procedures for operating the service propulsion system, the big service module engine. Some updates on those procedures caused by the DELTA-V switch problem of day before yesterday. We also passed up the information that as a result of tests run so far here on the ground of the tape meter we believe there will be no problem with its operation. Those tests are continuing. We're subjecting them to 5 psi oxygen in a vacuum and no problems so far during the tests with the tape meter. We powered up

PAO some of the equipment in the SIM Bay, a Scientific Instrument Module, in the service module, primarily the cameras. Read out the data on those. That all looks good. Then at 61 hours 15 minutes elapse time, Dave Scott reported as he was beginning to chlorinate the potable water on the command module. A leak developed in the chlorination port, a rather substantial leak. We advised them to turn off some regulators to reduce the pressure in the tank immediately. And then passed up the procedure which corrected the leak. Consisted of using two of the onboard tools. An allen wrench and a ratchet to tighten up the port. The leak is attributed to the backing out of a nut, which holds some washers in that port. The crew seemed pleased that they got the procedure fairly rapidly. For that they can thank the subsystem manager for the command and service module crew station. His name is Cris Perner, Perner, from the flight crew integration division here at the Manned Spacecraft Center. He recognized prelaunch, the possibility of a leak in this port and had already written out the procedures on what to do if it did develope in flight. As it turned out those procedures did solve the problem. The leak has been stopped, the water has been chlorinated properly now and the crew commented they wondered that if, whether Captain James Cook the skipper of the original Endeavour, had ever sprung a leak on his ship. They've mopped up the interior of the command module with towels that are now hanging in the tunnel, looking like someones laundry according to Dave Scott.

END OF TAPE

APOLLO MISSION COMMENTARY, 7/28/71, GET 63:17:00, 178/1

PAO The crew seemed pleased, if they got the
proce - We said goodnight to the crew and secured communica-
tions at 62 hours 21 minutes shortly after Dave Scott re-
ported that the crew status was good. They have taken no
medication. They've consumed all their meals on schedule,
and that the cabin pressure was reading 5.7 pounds per square
inch for the evening. He also gave readouts on - for bat-
teries on the reaction control system quantities, all of
which are good. We have gtom the flight dynamics officer
on the Maroon team, Bill Boone. Some updates on estimated
predicted numbers during the next few maneuvers. At this
time, it appears that midcourse correction number 4 will re-
quire a DELTA V or a change of velocity of 4.1 feet per
second be performed with the service module engine, the SPS.
The burn duration will be .73 seconds and the ignition time
73 hours 30 minutes 59 seconds. The latest update on the
lunar orbit insertion, ignition time 78 hours 31 minutes
34 seconds. A DELTA V of 2997.5 feet per second, again using
the SPS. Duration of the burn, 6 minutes 41 seconds. The
predicted lunar orbit resulting from that maneuver, an
apolune of 169.5 nautical miles; perilune 58.3 nautical
miles. Descent orbit insertion, ignition time 82 hours
39 minutes 48 seconds. DELTA V 207.6 feet per second, SPS
engine. Duration of the burn 23 seconds. Resulting orbit,
58.5 by 9.3 nautical miles. The predicted entrance into the
lunar sphere of influence has moved up about 2 minutes. Now,
63 hours 55 minutes 20 seconds. And, here's the latest
update on the S-IVB lunar impact. The time of impact, 79 hours
24 minutes 38 seconds. The coordinates, 1 degree 7 minutes
south, 11 degrees 41 minutes west. Apollo 15 now 189 655
nautical miles from earth. Velocity 2950 feet per second.
At 63 hours 21 minutes, this is Mission Control, Houston.

END OF TAPE

PAO This is Apollo Control at 64 hours. We said goodnight to the crew about an hour and 40 minutes ago. The flight surgeon reported just a few minutes ago that it appears Dave Scott has now settled down and is asleep. Scott is the only crewman on whom we'll have biomedical data during the rest period. Just a few minutes ago we past into the lunar sphere of influence, a point at which for computational purposes, we begin computing the spacecrafts position with respect to the moon rather than with respect to the earth. And it's also the point at which the moon's gravity becomes the dominant force acting upon the spacecraft. We begin to see the velocity increase as the spacecraft accelerates toward the moon. The flight dynamics officer will shortly be switching his displays over to moon reference. At the present time, we're still reading velocity and altitude with respect to earth showing the spacecraft at a speed of 2930 feet per second and at an altitude from the earth at 190 807 nautical miles. During this shift, principle activities will be to monitor the trajectory of the spacecraft to make any modifications necessary to the planned maneuvers for midcourse correction 4 at 73 hours 31 minutes. And for lunar orbit insertion and the descent orbit insertion burns which occur at about 78 hours 32 minutes and 82 hours 40 minutes. Those times precisely are 73 hours 30 minutes 59 seconds for midcourse correction 4, 78 hours 31 minutes 34 seconds for lunar orbit insertion and 82 hours 39 minutes 48 seconds for descent orbit insertion, all to be performed with the service propulsion system engine on the command and service module. The sphere entrance time, entering the lunar sphere of influence was 63 hours 55 minutes 20 seconds. During the crew sleep period we'll be standing by monitoring for any possible conversation, although during this flight we've had no conversations with the crew during a rest period, and would not anticipate any this evening. We'll be coming up hourly for status reports. At 64 hours 2 minutes, this is Apollo Control.

END OF TAPE

APOLLO 15, MISSION COMMENTARY, 7/29/71, CDT 1:34, GET 65:00, 180/1

PAO This is Apollo Control at 65 hours
The crew now about 2 1/2 hours into their rest period,
about 5 hours remaining before they're scheduled to awaken.
We have an update on the S-IVB impact. The Saturn 3rd
stage is scheduled to hit the moon now at 79 hours 24 minutes
42 seconds ground elapsed time. The coordinates have changed
slightly. We're now showing the impact point at .997 degrees
south, that would be 0.997 degrees south and 11.872 degrees
west. Apollo 15 at this time is, 31 470 nautical miles
from the moon and traveling at a speed, with respect to
the moon, at 3653 feet per second.

END OF TAPE

PAO This is Apollo Control at 66 hours 1 minute. Apollo 15 at present time continuing at its passive thermo control mode and the crew about 4 hours away from the scheduled time of awakening. In the passive thermal control mode the spacecraft is rotating about its longitude and axis at the rate of about 3 revolutions per hour to maintain uniform exposure to the sun and the proper thermal control of the spacecraft. This slow roll is set up by the crew prior to beginning their sleep period and on this mission we've had very good luck with the - that attitude holding and very small deviations. On occasion previous missions we have noted that occasional in the passive thermal control mode is set up that it will begin to diverge after several hours if its not put into a very stable position and it has on occasion been necessary to awaken the crew and get them to reestablish the passive thermal control. However, as I mentioned, we're holding very stable and would see no reason for having to reestablish the passive thermal control mode. Apollo 15 at the present time is 29 258 nautical miles from the moon and the spacecraft velocity is 3669 feet per second. The cabin temperature has been holding steady at around 65 to 70 degrees and pressure about 5.2 pounds per square inch. And all spacecraft systems appear to be functioning about as expected at the present time. In mission control we've been using this quiet period to do such things as recalibrate recorders and review activities that will be coming up tomorrow, also flight director Glenn Lunney has been going over with some of the flight controllers the techniques that will used for the landing on the moon, which this shift will handle. And we now show 3 hours 56 minutes until scheduled crew awakening time. This is Apollo Control standing by at 66 hours 3 minutes.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/29/71, GET 67:00, 182/1

PAO This is Apollo Control. We've been monitoring all systems on the spacecraft since putting the crew to bed. And, everything continues to be normal. Flight Director Glynn Lunney at the moment is going around the room double-checking the status with each of his flight controllers. And, there appears to be no change in status. Apollo 15 at the moment is 27,152 nautical miles from the moon, and the spacecraft's velocity is 3686 feet per second. At 67 hours, this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/29/71, 4:34 CDR, 68:00 GET, 183/1

PAO This is Apollo Control at 68 hours. We're continuing to get a good solid tracking data from the Manned Space Flight Network stations at Honeysuckle Creek

and parts of Australia and all systems functioning normally on the spacecraft. We have about 2 hours remaining in the crew's rest period. And on awakening, activities will begin to pick up for the crew as we near lunar orbit insertion. During the day's activities, they'll have a midcourse correction. That will be a small burn of about 73 hundredths of a second with the service propulsion system engine, which will occur at about 73 hours 30 minutes 59 seconds, and lunar orbit insertion is scheduled for 78 hours 31 minutes 34 seconds. The Saturn third stage, the S-IVB is scheduled to impact the moon at 79 hours 24 minutes 42 seconds. And also prior to lunar orbit insertion the crew will be jettisoning the door on the scientific instrument module of the service module exposing the cameras and other sensors to the lunar environment. At the present time, we show Apollo 15 24 930 nautical miles from the moon and the spacecraft velocity up now to 3707 feet per second.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/29/71 GET 69:00 CST 5:34 MC 184/1

PAO This is Apollo Control at 69 hours. We're just about 1 hour now from awakening the crew. On getting up this morning the crews first activity following breakfast will be to prepare cameras for photographing the jettisoning of the scientific instrument module door. About 3 and a half hours after awakening they are scheduled to perform the final mid-course correction on route to the Moon. That maneuver scheduled to occur at 73 hours 30 minutes 59 seconds. We do anticipate having a change of shift Press Briefing that will occur at about 7:15, Houston time in the News Center Briefing Room. Apollo 15 is now 22 758 nautical miles from the Moon. The spacecraft velocity is 3 733 feet per second.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/29/71, 6:34 CDT, 70:00 GET, 185/1

PAO This is Apollo Control at 70 hours. We're standing by to put in a call to the crew if we don't see some signs of activity in the spacecraft first indicating that they are up and about. The 8 hour rest period is scheduled to be over at this time and the crew does have a rather busy day of activities ahead of them, so we do plan to get them going pretty much on schedule. Apollo 15 at the present time is 20 582 nautical miles from the moon and travelling at a speed of 3764 feet per second. Here in Mission Control we'll be handing over the shift shortly. Flight director Jerry Griffin will be coming on to replace flight director Glynn Lunney. And - We've just had a call to the crew. We'll stand by and pick up the response here.

SC Hello, Houston. Apollo 15.

CAPCOM Roger. Good morning Dave. Time to rise and shine.

SC Okay. (garbled)

SC Good morning.

CAPCOM And we've got the usual quota of checklist changes, flight plan updates, et cetera, when you guys are ready, give me a call. Looks like you guys had a good night's sleep last night, for you anyway, Dave.

SC Okay. We're all pretty good. We'll get organized and give you a call here in a few minutes.

CAPCOM Roger.

PAO Our spacecraft communicator at the moment is astronaut Bob Parker and he'll be replaced shortly by the oncoming capcom, astronaut Joe Allen. There will be a change of shift press briefing. We expect that it will begin at about 7:15 or shortly thereafter in the News Center briefing room.

END OF TAPE

APOLLO 15, MISSION COMMENTARY, 7/29/71 CDT 6:54, GET 70:19, 186/1

SC Houston, Apollo 15.
CAPCOM Roger, good morning.
SC Good morning. I have my consumables report for you and sleep report.
CAPCOM Okay. We're ready to copy.
SC Okay on the commander PRD. 7 1/2 hours sleep. CMP 25 012, same sleep LMP 08 013, same amount of sleep. On the consumables 7015 RCS 90 87 84 88 on the H2 90 89 60 02 88 89 and 65. Over.
CAPCOM Roger. And before I read that back, we did not catch the commander's PRD reading.
SC That was 23 046.
CAPCOM Roger, copy. Understand, we have commanders PRD 23 046, 7 1/2 hours sleep for all three crewmen. 25 012 for the CMP and 08 013 for the LMP.
CAPCOM And we have consumables update, based on our figures from the ground for 7000, we have 84 percent total, and we have 85 84 84 and 85. And for H2 we have 91 90 and 60. For 02 we have 89 90 and 73. Over.
SC Roger. I'm ready for any update of Flight Plan you might have.
CAPCOM Okay, First we have flight plan update for the day. We'll start out at,- standby.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/29/71, 7:03 CDT, 70:29 GET, 187/1

CAPCOM 15, Houston. You back with us again?
SC Roger. We've been here all along, Glynn.
CAPCOM Roger. We had the usual signal break when we went around in TTC there. Let me ask you one question. The ECOMMS are interested in getting a verification on the O2 tank three readout. There's a difference of 8 percent there. And then after we get that we'll proceed with this update. It's a very long ones I guess you might as - -
SC Okay. Stand by.
CAPCOM - - well drag out your flight plan.
SC Okay. What do we need now? That's 74 onboard.
CAPCOM Roger. Understand 74. Okay, Jim. And we'll start this flight plan update at 71 hours, so you can tell me when you get there.
SC Okay. I'm there.
CAPCOM All right. At 71 hours you want to add the following information. High gain antenna on MSFN cue and note that we won't stop PTC. We'll have to give you a number depending on where you are in PTC as we come around at this point. Second line is S-band OCS TV to science, pan camera mode to stand by. That's a verify. Pan camera power ON. Pan camera self test to heaters. Mapping camera ON to standby. Then after five minutes pan camera power OFF and S-band OCS TV OFF. Copy?
SC Okay. Here's the readback, Bob. At 71 hours high gain antenna on MSFN cue, S-band OCS TV to science, pan camera mode to standby, that's to verify, pan camera power ON, pan camera self test to heaters, mapping camera ON to standby, after five minutes pan camera OFF and S-band OCS TV OFF.
CAPCOM Roger. That's good. Okay. Next item is 71:15. This will be a line added in after the CM/LM pressure equalization decal. And a line says press equal valve close. Over.
SC Roger. 71:15, pressure equalization valve close.
CAPCOM Roger. And next one is on 73 hours and 15 minutes.
SC Okay. Go.
CAPCOM Okay. And at 73:15 we will delete the line referring to waste water dump. Waste water dump will be deleted.
SC Okay. I copy. Delete the waste water dump.
CAPCOM Okay. Next one will be at 81:42. 8142.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/29/71, GET 70:35, CDT 0710 188/1

SC Go.

CAPCOM Okay. And in the configuration for the camera there, we're changing that from CM 4 to CM 3 on the second line.

SC Okay. In CM 3 we put CM 4.

CAPCOM Roger. Next one's on ED 4 24, 84 24.

SC Okay, go.

CAPCOM Roger. Also configuration of the camera and we'll change that one also to CM 3 instead of CM 4.

SC I copy.

CAPCOM Roger, and then over on the other side of the page 84-40, again terminate a photos. The first, the first line there E440 will now EL-on and the time will be T start minus 140. L 4 zero.

SC Okay, I copy.

CAPCOM And then at 8442, EL off will now be at EL off (garble) this is T start.

SC I copy.

CAPCOM Okay, and we have two general notes. One refers to sim door jett and it's a reminder that we verify that the left band shield is mounted in window 5 with the cardboard shade off for a photograph of sim door jett. This is about 74 hours.

SC Okay, understand.

CJPCOM Okay, and second one is with respect to the optics cal. And I guess that we should explain here that people who are wringing their hands down here about the fact the we looked at a little bit of a bias drift when you guys zeroed the optics the first day, and we sent up some procedures yesterday saying to be careful when you are doing it for P23 and then everybody else decided we ought to be careful when we did it for other things besides P23. And so we have the following procedures which are basically to avoid high trunnion rates for all optics zeroing so that we don't get any possible shift of the mirror calibration and the procedures are twofold. First I guess you might write them down some place. The optics power is off, place zero switch off before turning the optics power on. And then after the power is on drive the optics manually to a trunnion of less than 10 degrees before placing the zero switch on. Over.

SC Okay, Bob. If optics power off, then optics zero switch zero?

CAPCOM Roger. It really is if optics power off, place the zero switch off before turning the power on.

CAPCOM 15, Houston again.

CAPCOM 15, Houston.

SC Bob, would you read that procedure again and make sure I have it correct. I have optics power off, then optics zero switch zero.

CAPCOM Okay, Jim. The thing is, if your optics power

CAPCOM is off as it will be like this morning, and the zero switch is already on, as it probably is this morning, we want you to place the zero switch to off before you turn the optics power on, because otherwise it would then automatically zero without you having control over it. Do you understand?

SC Okay, we understand.

CAPCOM Okay, and the coral area -

SC Read the rest of it after the OP.

CAPCOM Okay, and then after. Okay, I'll read it through from the beginning again. If optics power off, place zero switch off before turning optics power on. Then drive optics manually to trunnion less than 10 degrees before put - .

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/29/71 GET 70:44 CDT 7:18 189/1

CAPCOM The power on. Then, drive optics manually to trunnion less than 10 degrees before placing zero switch on, over.

SC Okay, that was after the optic's power on drive optics until trunnion less than 10 degrees before zero switch on.

CAPCOM Roger, Jim. The correlary to that is if the optics' power is already on, then we drive the optics' power manually to a trunnion of less than 10 degrees before placing the zero switch on. That's the second part.

SC Okay, we copied.

CAPCOM Okay, and then I have an update to your contingency checklist page 4-3 which pertainsto LOI burn rule if you can get that out.

SC Stand by.

CAPCOM Roger.

SC Okay, Bob. I have the contingency checklist.

CAPCOM Okay, I got 4 -- page 4-3.

SC Okay, I have 43.

CAPCOM Okay, and these changes are basicly in the table there. We'll start out under the heading of Burn Time. And that first one will be changed from 00 to 136 now instead of 135. So, it'll be 136 in the first burn time. On the second line will be 136 to 157. And the third line will be 157 to 213. And the fourth line will be 213 to 311, over.

SC Copy.

CAPCOM Okay, the next one in the second column, DELTA-V M. The lines will be 0 to, or 0-640, 640-784, 784-900, 900-1313, over.

SC And copy.

CAPCOM And in the second block, the lower block, under the updates for the times and angles, we have the following readings under the update column, the GET and LOI ignition is 783134.2. The second time is 790134.2. And the angles are 144358 and 68, over.

SC Okay, copied on the update time, 783134.2, 790134.2, 144358 and 68.

CAPCOM Roger. And (garble) also changes your little graph over on your side there. Primarily what it does is to enlarge the mode 130 region by about 10 feet per second on either side and it changes the LOI plus 30 abort DELTA-V line by essentially extending and raising the left hand corner just a wee bit. We could feed up the lines to it if you want but I'm not sure you really need those, over.

SC Okay, understand.

CAPCOM We're coming up on another OMNI switch. We'll be back with you in a minute, Jim.

PAO And this is Apollo Control as we come up through a rotation of passive thermal control and lose lock with one of the OMNI antennas. We'll take the circuit down in the next few

APOLLO 15 MISSION COMMENTARY 7/29/71 GET 70:44 CDT 7:18 189/2

PAO moments to prepare for change of shift press conference in the News Room -- Briefing Room building 1.

PAO The distance from the Moon now 18674 feet per sec -- nautical miles approaching the Moon at 3797 feet per second. Any air to ground conversation between Mission Control and the crew of Apollo 15 taking place during the change of shift press conference with Black Team Flight Director Glynn Lunney will be recorded played back on a delayed basis and we'll rejoin air to ground communications live at that time. At 70 hours 52 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

PAO Every 2 hours the spacecraft analysis - -
This is Apollo Control again. Hopefully the line is up properly.
Every 2 hours the spacecraft analysis room in the back of the
Mission Control Center here prepares a report on the status of
the spacecraft systems. The report issued at 70 hours ground
elapsed time, a little over an hour ago, is very short; about
3 quarters of a page; the entries under thermal, displays and
controls, instrumentation, power distribution and sequencing,
communication, crew systems, guidance and control, propulsion
and power all have entries such as: No change in status; our
systems performance has been normal. Under fuel cells and
cryogenics, the statement reads: The fuel cells are normal
delivering approximately 75 amperes to the spacecraft systems.
The cryogenic system is normal with approximately 817 pounds
of oxygen remaining and approximately 67.8 pounds of hydrogen
remaining. The command module batteries; battery A has 39 amp-
hours remaining; battery B 39, battery C 37.8. No change in the
LM batteries. And that is the extent of the report from the
spacecraft analysis room issued at 70 hours ground elapsed
time. During the time the press conference - change of shift
press conference was underway, some 2 minutes plus air to ground
communications have been recorded. We'll play those back at
this time and resume live communications with the crew of
Apollo 15.

CAPCOM Okay 15, we're back with you.

SC 15, Houston, we're back up.

SC We read you.

CAPCOM Okay. Understand you really thought I didn't
feel you needed the complete update to that graph, Jim.

CAPCOM Jim, if you can - is that a verify on the fact
that you don't want the update on the graph. Over.

SC I think we can do it ourselves, Bob.

CAPCOM Oh, Rog. Okay, and that's all the update
we have for you at the moment. You might be interested in
knowing that that water dump you guys scheduled last night
before you went to bed, was at a very opportune time; your
PTC shifted plus or minus 2-1/2 degrees all night.

SC Very, very good.

CAPCOM We'll be up with the news in a while.

SC Okay.

CAPCOM 15, Houston. We have a pitch of minus 30
and a Yaw of 85 for the high gain antenna and we'll give you
a mark when to go. Uh, go now.

SC Okay, minus 30 and 85.

CAPCOM And, 15, we're getting you on high gain and
receiving - -

SC Okay, we understand you're getting the data.

CAPCOM That's affirmed.

SC Houston, this is 15.

CAPCOM Roger, go (garble).

SC Roger. We just want to confirm the position

APOLLO 15 MISSION COMMENTARY, 7/29/71, 7:23CDT, 71:08GET, 190/2

SC of the switches on the mapping camera and
pan camera. We have the mapping camera on just standby, and
the pan camera, power off. Is that correct?

CAPCOM Rog. If you finished, that's the correct
position.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/29/71 GET7113 CDT0747 191/1

CAPCOM 15. We'll take OMNI Delta at this time please.
SC Roger OMNI Delta.
PAO Now live on air ground with Apollo 15.
CAPCOM 15, we'd like wide and manual on high gain please.
SC Roger.
CAPCOM Apollo 15, this is Houston. Select OMNI Bravo
please.
SC OMNI Bravo.
CAPCOM Apollo 15, Houston.
SC Go ahead Joe.
SC Joe.
CAPCOM Stand by Jim. I'll wait till the (garble).

END OF TP AE

APOLLO 15 MISSION COMMENTARY 7/29/71 GET 71:35 CDT 8:09 192/1

CAPCOM Hello 15, this is Houston.

SC Go ahead, Joe.

CAPCOM Good morning Jim. This is your friendly News Reporter on duty now. I wondered if you would be interested in something from the local Newspapers?

SC Oh, yes. We certainly would.

CAPCOM Roger. This is from the MOCR Gold Bugle and Taglich Zeitung News. The Administration effort to rescue Lockheed Aircraft, cleared a major hurdle in the Senate yesterday when an amendment to deny favored status was rejected 60 to 35. Houston unemployment rose to 4.1 percent in June, an increase of a full percentage point for May, which is the highest in 6 years. And this mornings Post reports that the checkout of Falcon went on with a few words from Worden and virtually nothing from the other Astronauts. However, I think that's incorrect and I enjoyed talking to you very much yesterday. In sporting news, Houston dumped Philadelphia 6 to 3, and is now in fourth place, 10 games behind the Giants. And an interesting note from the North. Bart Starr underwent surgery yesterday for a bicep tendon transplant, and will be out of action for at least 12 weeks. And that's all from the Taglich Zeitung this morning.

SC Thank you, Joe. Enjoyed it.

CAPCOM Roger, Dave. Good morning.

CAPCOM Al, this is Houston. And we're standing by for your null bias EMS check if you've gotten to that yet.

SC Roger. The Delta V test was good and the null bias was 1.0.

CAPCOM Roger. Copy.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/29/71 GET7155 CDT819 193/1

CAPCOM 15, this is Houston. Roger, Jim. Just wanted to tell you to expect all your updates on time except the pad and we are going to delay the pad to 72 plus 50 because of very good tracking data we'll be getting in those last few extra minutes there.

SC Okay, understand expect pad about 72 50.

CAPCOM Roger.

CAPCOM Go ahead 15. This is Houston. We hear you now.

SC Boy another day. Listen on this - on the door jettison photography we've got about 50 percent left on mag A and we thought we would go ahead and use that.

CAPCOM Good morning, Alfredo. We copied you but I'm not sure that I understand your question.

SC Okay, Joe, it's not a question - just wanted to let you know that the 16 millimeter photography for the fifth door jet, the flight plan called out mag - stand a moment.

END OF TAPE

SC Plus I called out mag - stand by one.
SC It called out mag Echo and we're going to use mag Alpha instead. We had about 50 percent left on it. Just letting you know.

CAPCOM Okay Al. Thank you. And by the way is that the manuever where the SIM Bay door jettisons the spacecraft?

SC It has been variously known as that kind of a manuever yes.

CAPCOM Roger. I'm looking forward to that.

PAO This is Apollo Control. Everything this morning going along on schedule. Next major event in the mission will be the midcourse correction number 4 manuever. At the nominal flight plan time of 73 hours 31 minutes 14 seconds looking at a desired velocity change of 5.3 feet per second. The burn will be with the service propulsion system on bank B only. All other major burns of the SPS and, in and out of lunar orbit will be made with both banks. Bank A having to be switched on manually. Following the midcourse correction the SIM door jettison, that is the scientific instrument module door covering the scientific gear for orbital science task back in the service module. This takes place at 74 hours and 1 minute. The door is 5 feet wide and 9, 9 and a half feet long and weights about 170 pounds. An explosive cord going all the way around the interior of the door will be detonated to actually shear the metal. It's been pregroved where it can shear along that line, also some booster explosives at each corner of the door will push it out away from the spacecraft at approximately 7 feet per second. The crew at this time will have on their pressure suits in a soft condition unpressurised but with helmets and gloves on for the SIM door jettison. This is the first time that the SIM door, the SIM Bay has been flown on any Apollo mission. It will be on all the remaining Apollo missions, a so called J-Mission series

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/29/71, 8:49CDT, 72:14GET, 195/1

PAO it'll be on all the remaining Apollo missions or so-called J mission series. Apollo 15 is now 15 505 nautical miles from the Moon, approaching at 3870 feet per second. Re-joining live air/ground. At 72 hours 16 minutes ground elapsed time this is Apollo Control.

CAPCOM Apollo 15, Houston.

CAPCOM Roger, 15, I have a maneuver pad PC plus 2, when you're ready to copy.

SC Okay, Joe, stand by.

CAPCOM Roger.

PAO This is Apollo Control. The PC plus 2, the pad referred to by spacecraft communicator, Joe Allen, is the pericynthian plus 2 hours abort pad, which would be a maneuver - -

SC Okay, go ahead.

CAPCOM Roger. Pc plus 2 SPS G&N. 66313 plus 123 minus 012, 080 29 1347 plus 31894 minus 24370 minus 13565, 175 079 332 all other is NA, ullage none, other burn equals SPS docked. Over.

SC Roger, Joe, copy. Play changes plus 2 SPS G&N. 66313 plus 123 minus 012, 080 29 1347 plus 31894 minus 24370 minus 13565, 175 079 332 no ullage and that burn equals SPS docked.

CAPCOM Readback's correct, Al. Thank you.

SC Rog.

PAO This is Apollo Control. To recapitulate the pericynthian plus 2-hour abort pad read up to the crew; ignition time for such an abort, should it become necessary, would be at 80 hours 29 minutes 13.47 seconds ground elapsed time, would be a docked burn with the lunar module still attached, using the service propulsion system, total velocity change posigrade 3189.4 feet per second. Should be getting the maneuver pad up to the crew before too long for midcourse number 4 at 73 hours 31 minutes ignition time. Standing by live on air/ground this is Apollo Control at 72:27.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/29/71 GET 72:28 CDT 9:02 196/1

CAPCOM Apollo 15, this is Houston. We need P00 and ACCEPT to give you a state vector and a target load and we'll uplink when we get the next OMNI.

CAPCOM Roger, thank you.

CAPCOM Apollo 15. This is Houston. With the maneuver pad midcourse 4, when you're ready.

SC Okay. Stand by 1, Joe.

CAPCOM Roger, standing by.

SC (garble)

CAPCOM Roger, Jim. Midcourse 4 SPS G&N: 66531 plus 123 minus 012 073 31 1402 plus 00019 minus 00036 plus 00035 038 240 331. 15, hold off the P52 we're commanding and go to P00 and ACCEPT, please.

SC Roger, Joe.

SC Okay, we're back in P00 and ACCEPT. Have you got just the uplink?

CAPCOM Roger, 15. I'll continue with the PAD. HA is NA NA 00054 001 00032 231061 176. The rest is NA. GDC aline Vega Deneb.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/29/71 GET 72:45 CDT 9:19 197/1

CAPCOM GCD aline, Vega Deneb roll aline 209 009 349, ullage none, other LM light, 36256, SIM door jet attitude is nominal. Single bank BRAVO burn. High-gain pitch 21, yaw 243, over.

SC Okay, Joe, readback for midcourse 4 FDS G&N 66531 plus 123 minus 012 073 31 1402 plus 00019 minus 00036 plus 00035 038 240 331 00054 001 00032 23 1061 176. Vega Denab 209 009 349. No ullage. Left weight 36256, SIM door jet, attitude is nominal. Single bank burn on BRAVO. High-gain pitch 21, yaw 243.

CAPCOM Roger, Jim. Sounds good and it's your computer.

SC Roger.

PAO This is Apollo Control. To recap the numbers just read up to the crew of Apollo 15 by their spacecraft communicator, there is a so-called maneuver pad for the midcourse correction burn number 4 for the time of ignition of 73 hours 31 minutes 14 seconds. Total velocity change of 5.4 feet per second. Burn time 1 second and it'll be with the Service Propulsion System on Bank B. Rejoining so much scratchy air-ground as we drift through from one OMNI antenna to the other. This is Apollo Control.

SC Okay, Houston. Gimbal anbles up, we'll torque them on the (garble).

CAPCOM Roger, 15.

CAPCOM Roger, Dave, we've got them, thank you.

CAPCOM Apollo 15, Houston. Requesting the high-gain when convenient.

SC Roger, Jim.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/29/71, 9:50cdt, 73:16get, 198/1

CAPCOM Apollo 15, Houston. Just a reminder to load the DAP and then go on back.

PAO 10 seconds to burn.

SC Okay, Houston, 15 with the burn status report.

CAPCOM Go ahead, Dave, this is Houston.

SC Okay, I guess you could see it was a nice smooth burn on time. Burn time was a second; Delta V GX end of the burn was .2; there was no trim; residuals were plus .2 minus 0.1, delta VC was minus 2.3.

CAPCOM Roger Dave. We copy and we think you're bragging, but you have a reason to. Beautiful burn.

SC It's all this nice machinery up here, Joe.

PAO This is Apollo Control. Midcourse maneuver number 4 was on time, burn time of 81 hundredths of 1 second. The crew reported no residuals or no trim, that is no tweeking maneuvers to take out any errors or dispersions in the burn. Apollo 15 is now 12 421 nautical miles out from the Moon approaching at a velocity of 3974 feet per second. Crew coming up on a suit circuit integrity check in preparation for jettisoning the SIM bay door, that is, the panel covering the scientific instrument module in the - back in the service module. The comment from the guidance officer was that the burn could not have been more nominal. At 73 hours 37 minutes ground elapsed time, live on Apollo 15 air/ground, this is Apollo Control.

SC Okay, Houston, 15.

CAPCOM Roger, go ahead.

SC Okay. Suit pressure integrity check is okay. The flow was about .3 or .4, and we're proceeding into the setup for the SIM bay door jettison and we'll give you a call when we get everything ready before we blow it.

CAPCOM Roger, Dave. Sounds good.

SC Houston, this is 15. We're ready to turn pan camera power ON, if you are.

CAPCOM Roger, Jim, go ahead.

SC Okay. It's coming on now.

CAPCOM 15, Houston.

SC Go ahead, Houston.

CAPCOM Jim, we're not sure that the cameras are running properly. We want you to check the two SEB circuit breakers on panel 5 IN and confirm for us that you got the right talk back when you turned them ON.

SC The two circuit breakers on panel 5 are IN. Stand by. Joe, there's no talk back called out here on the Pan camera power ON.

END OF TAPE

APOLLO 15 MISSION SUMMARY, 7/29/71 GET735700 CDT1031 199/1

SC Got you. Called out here on the pan camera power on.

CAPCOM Roger, we copy. And Jim, apparently when you turn the power on you should get about 2 seconds of barberpole and then back to gray. It may very well have happened and you just didn't notice it.

SC Okay, standby. Houston, this is 15. Do you want us to turn the pan camera power on again and check that talkback a little more carefully.

CAPCOM Jim, that sounds like a good idea to us.

SC Houston, 15.

CAPCOM Would you turn the pan camera power off, wait 30 seconds and then go back on watching the - watching for the barberpole indication, please.

SC Okay, that's in work.

SC Houston. This is 15.

CAPCOM Roger, go ahead.

SC Roger. We have the SIM AC power off down on 180 per the T40 checklist. Should we put that power on?

CAPCOM Jim, that's affirm. That power should be on and that's probably our problem. Thank you.

PAO This is Apollo Control the SIM door jettison has been delayed momentarily until the switches are in the proper position getting power to the SIM cameras down in the SIM Bay. It's not a time critical event.

SC Houston, the SIM AC power is on and the pan cameras are coming back to power at this time.

CAPCOM Roger.

SC And we got a barberpole for 2 seconds.

CAPCOM Roger, as advertised. Thank you, Dave.

SC Okay, I did pick a little spot in the cleanup of P40 that didn't get carried over in the flight plan.

CAPCOM We concur. 15 verify map camera, standby please.

SC Standby. Okay, mapping camera going standby.

CAPCOM Roger.

SC The mapping camera is in standby now but required a change.

SC Okay, Houston, 15. Do you want the mapping camera to standby for the door jett.

CAPCOM That's affirm 15. Map camera standby.

SC Okay. Houston would you like the SIM sector AC power off for the SIM door jettison?

CAPCOM That's right, Jim. Per the checklist, the first one in step four.

SC Okay, we just wanted to confirm it.

CAPCOM Roger, sounds like a good idea. I think we have a bug or two in this procedure. Apollo 15, Houston.

SC Go ahead Houston.

APOLLO 15 MISSION COMMENTARY, 7/29/71 GET735700 CDT1031 199/2

CAPCOM Roger, Dave. We're ready for pan camera power to boost. On your step 2 there you are GO for SIM door jettison and we want you to watch the fuel cell reactant valves after the jettison per the checklist, just a reminder of that. Over.

SC Okay, understand and we are in boost and we'll give you a mark when we blow the door.

CAPCOM Roger, and we will be standing by for a description.

SC Roger.

CAPCOM Okay, Houston, 15, to SIM door jett, 3, 2, 1 Mark. I felt a little shutter but not too much.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/29/71 GET 74:07 CDT 10:40 200/1

PAO This is Apollo Control. We mark the time of actual SIM door jettison at 74 hours 6 minutes 47 seconds rejoining live airto ground.

SC Okay, Houston, we have negative visual on the SIM door as of yet. And the fuel cells loaded okay. The RCS BRAVO primary talkback went to barber pole and is reset and otherwise no reaction in here.

CAPCOM Roger, Dave. We copy. And we assume you didn't notice any debris of any kind either.

SC Nothing in particular, Joe, and Jim has got a visual now.

SC Okay, Houston. Jim's got it out of his window and he's taking pictures and he says it's slowly tumbling.

CAPCOM Roger.

CAPCOM And 15, just out of interest, we saw a good healthy jolt in our doppler data down here concerning jett time.

SC Gee, that's very interesting because I would say that the jolt in here was very minor.

SC Houston, 15. I guess the consensus would say that the -- the shock was about one-tenth of the other pyros we've seen up to this point.

CAPCOM Roger, Dave. We copy. And can you still see the world's largest lens cap out the window?

SC We'll check.

PAO This is Apollo Control. Some distance and velocity figures. Altitude now 10915 nautical miles out from the Moon approaching at a velocity of 4042 feet per second. Successful jettison of the SIM Bay door at 740647 a few moments late because of getting into the right power set up for the equipment in the SIM Bay, primarily the mapping and panoramic cameras. Rejoin the air-ground as it proceeds toward lunar orbit insertion later today. At 74 hours 16 minutes ground elapsed time, this is Apollo Control.

CAPCOM 15, this is Houston.

SC Houston, 15, go ahead.

CAPCOM Roger. We've looked ahead in several hours in our flight plan and we see no further inconsistencies between the check list and the flight plan like the small problems we just had with the power. So, I just wanted to advise you of this and just follow the flight plan as usual, over.

SC Okay, joe, we'll follow the cookbook, thank you.

CAPCOM Roger, Al.

PAO This is Apollo Control. Apollo 15 just crossed the 10 thousand mile mark in its approach to the Moon. Distance now 9975 nautical miles out. Velocity 4092 feet per second.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/29/71 GET7438 CDT1111 201/1

CAPCOM Apollo 15, this is Houston.
SC Houston, 15, go.
CAPCOM Roger, I've got a preliminary maneuver pad for
LOI when you are ready.
SC Okay, standby one.
SC Okay, standby one.
CAPCOM Okay, and Apollo 15 if you will give us P00 and
ACCEPT, please, we will give you a preliminary state vector,
target load, and a REFSMMAT.
SC Okay you've got P00 and ACCEPT.
CAPCOM Roger.
SC And I'm ready to copy the preliminary pad, Joe.
CAPCOM Roger, Jim. Just out of curiosity has the
Sim Bay door long since disappeared from view?
SC Yes, I looked for it a few minutes ago and
couldn't see it any longer.
CAPCOM Okay, thank you and I'll go ahead with the
maneuver pad. LOI SPS G&N 66 244 plus 121 minus 012 078
31 34 48 minus 28945 minus 07664 minus 01123. Roll, pitch
and yaw all zips. 01695 plus 00583 29964 640 29902 25 2671
228. The rest is NA. GDC aline, Vega Deneb on zero degrees
mark. Roll aline 264 090 349. No ullage. LM weight 36258
Over.
SC Roger, Joe. Readback for LOI SPS G&N 66 244
plus 121 minus 012 078 31 34 48 minus 28945 minus 07664 minus
01123. All zips for roll, pitch and yaw. 01695 plus 00583
29964 640 29902 25 2671 228. Vega and Deneb on the zero
mark. 264 090 349. No ullage. LM weight 36258.
CAPCOM That sounds good, Jim. Thank you.
PAO This is Apollo Control to translate what that
stream of numbers means. It's a preliminary maneuver pad
for the lunar orbit insertion maneuver later on
today. With a time of ignition as it stands now of 78 hours
31 minutes 34 seconds. Velocity change (retrograde that is)
of 2996 feet per second. Burn time 6 minutes 40 seconds
which would produce a lunar orbit for the pericynthian of
58.3 nautical miles apocynthian of 169.5 nautical miles.
Apollo 15 9,269 nautical miles out from earth. Velocity
4 137 feet per second.
CAPCOM Apollo 15, your computer.
SC Roger. Thank you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/29/71 GET 74:57 CDT 11:31 202/1

SC Houston, 15. The first P52 is complete and
I trust you got the torquing angles.

CAPCOM Roger. We copy.

SC Okay. (garble)

CAPCOM Dave, did you copy? We got the torquing
angles. Thank you.

SC Okay. And the second P52 is in work.

CAPCOM Roger.

SC And the second P52 torqued out at 7.

CAPCOM Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/29/71, 12:41cdt, 76:08get, 203/1

PAO This is Apollo Control at 76 hours 08 minutes ground elapsed time. Apollo 15 crew rather quiet during the past hour or more as they coast in toward the Moon. They're now 6331 nautical miles out from the Moon. Velocity continuing to build up, now showing 4401 feet per second. Here's a call now from the crew.

CAPCOM Go ahead 15.

SC Rog. Joe. Delta V test no bias check. The no bias is 1 foot per second per 100 seconds.

CAPCOM Okay, Al, we copy. Thank you.

SC Roger.

CAPCOM And Al, you'll be interested to know that the SIM bay data we're getting so far looks very good.

SC Okay, Joe. And you'll be interested to know that there's a very thin, crescent moon in front of us.

CAPCOM Roger. We've been suspecting that all along.

SC And it may be thin, but it's big.

PAO This is Apollo Control at 76 hours 11 minutes. We're in the process of a shift change in the Control Center now. Flight Director Milt Windler and his team relieving Gerry Griffin and his team of flight controllers. We estimate the change of shift news conference for 1 pm central daylight time. 1 pm central daylight time for the change of shift news conference. This is Apollo Control at 76 hours 24 minutes. Change of shift news conference is about to begin. We'll take the air/ground off the release line and tape will replay after the news conference.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/29/71, 13:14cdt, 76:39get, 204/1

PAO This is Apollo Control at 76 hours 39 minutes. Apollo 15 is 5003 nautical miles from the moon, velocity 4595 feet per second. There were no air/ground conversations during the news conference. We're back up live now; we'll continue to monitor live.

SC Rog. Houston, this is 15. The pre-LOI secondary glycol loop check looks good.

CAPCOM Did you trim it?

CAPCOM 15, we concur.

CAPCOM And 15, I have a TEI 4 pad for you any time that you have time to copy it.

SC Okay, stand by one.

SC Okay, Carl, I'm ready to copy the TEI 4 pad.

CAPCOM Roger. TEI 4, SPS G&N, 40015 plus 059 plus 121 087 12 4006 plus 31211 minus 20740 minus 06430 182 057 329 the rest is NA, ullage, 4 jetts 12 seconds, and this assumes burn undocked and no DOI and the roll, pitch, and yaw angles assume landing site REFSMMAT, and that's all.

?? (NASA Headquarters calling voice off net 1.)

SC 6 plus 31211 minus 20740 minus 0 - -

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/29/71, 13:19cdt, 76:44get, 205/1

SC minus 20740 minus 06430 182 057 329 4 jet
12 seconds assumes burn undocked, and no DOI landing site
REFSMMAT.

CAPCOM Roger, Jim. The part I got was correct, but
we had a loss of comm for the first part. Would you read the
- about the first 10 back to me again.

SC Roger. TEI 4, SPS G&N 40015. Houston, this
is 15, did you get all the readback?

CAPCOM 15, this is Houston. We're having a comm
problem down here on the ground and I need to check still
your noun 48 and your noun 33.

SC Okay. Noun 48 plus 059 plus 121 087 12 4006.

CAPCOM That's all correct, Jim.

SC Houston, 15.

CAPCOM 15 go ahead.

CAPCOM We copy.

SC Houston, Apollo 15.

CAPCOM 15 go ahead.

SC Roger, Carl, all the systems checks are
complete and everything looks good.

CAPCOM Very good.

PAO This is Apollo Control at 77 hours 08 minutes.
Apollo 15 now 3728 nautical miles from the Moon. Velocity
4875 feet per second. The Flight Dynamics Officer just
provided the Flight Director with some times. We expect
loss of signal as Apollo 15 goes behind the Moon at 78 hours
23 minutes 31 seconds. If the lunar orbit insertion burn
is not performed, we should acquire the spacecraft signal
at 78 hours 46 minutes 43 seconds; if we have a nominal LOI
burn, we should acquire at 78 hours 55 minutes 09 seconds.
The FIDO has also taken the final vectors on the S-IVB and
here is the final update on the impact time and co-ordinates
for the third stage of the Saturn V. Impact time: 79 hours
24 minutes 41 seconds; co-ordinates: .9970 South latitude
11.8719 West longitude. And at 77 hours 10 minutes, this
is Mission Control, Houston.

END OF TAPE

pao This is Apollo Control at 77 hours 23 minutes. We're 1 hour away from LOS now. And Apollo 15 is 3 044 miles from the moon. Velocity 5 083 feet per second. We're 1 hour 7 minutes 42 seconds away from the lunar orbit insertion burn which will be performed behind the moon.

SC Houston, Apollo 15.

CAPCOM 15, go ahead.

CAPCOM 15, this is Houston, go ahead.

SC Houston, Apollo 15.

CAPCOM 15, this is Houston, go ahead.

SC Okay, we've just made a little mission rules review up here and I have one question for you. Relative to the circuit breaker on bank A procedure at 6 minutes. Our interpretation of the mission rules said that if we have a bank B ball value close prematurely then we would leave that circuit breaker closed until shut down, and close or until 10 seconds prior to shut down using that as our good bank rather than closing it at 6 minutes, and this is in reference to the cue card at the bottom where it discusses one ball valve closing down prematurely.

CAPCOM Stand by.

SC Okay.

SC Houston 15. I'll just repeat it once here maybe in simpler terms. If bank B closes prematurely then we'll leave the pilot valve on A closed til 10 seconds prior to cut off instead of at 6 minutes.

CAPCOM Roger, we copy.

CAPCOM 15, Houston. We copy your question and we concur.

SC Okay, thank you. Everything else, I think we're squared away.

CAPCOM Roger. Milt says we owed you a review before every burn. Are you interested in a quick run through of what happens at LOI?

SC Sure why not. Let's do it.

CAPCOM Okay. As I have it here, starting at T minus 2. T minus 2 minutes, we close the main B pilot valve circuit breaker, at T minus 5 seconds, we pro. Then the Delta V thrust A&B switches both go to normal. At T plus 5 seconds, we close the main A pilot valve circuit breaker, and at T plus 6 minutes, assuming nominal burns we open the main A pilot valve circuit breaker and after that we avoid PUGS manipulation. And a reminder here, don't forget to turn on the DSE because we're vitally interested in that single engine burn performance.

SC Okay Houston, we're right with you. We've just gone through that and we understand it. Thank you.

CAPCOM Very good.

CAPCOM 15, this is Houston. If you'll give us ACCEPT we'll send up a new state vector.

SC Rog, you got it. POO and ACCEPT.

APOLLO 15 MISSION COMMENTARY 7/29/71 GET7710 CDT1345 206/2

CAPCOM Okay and I have an LOI pad for you whenever your
ready to copy.

SC Okay Carl, I'm ready to copy.

CAPCOM Okay, LOI, SPS G&N. 66244 plus 121 minus 012
078 31 4-

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/29/71, 14:06cdt, 77:31get, 207/1

CAPCOM - - 121 minus 012 078 31 4591 minus 28975
minus 07764 minus 00441 all zips for roll, all zips for pitch,
all zips for yaw, 01696 plus 00584 30001 641 29939 25 2671
228 the rest is NA; set stars are Vega and Deneb 264 090 349
no ullage; LM weight 36258 single bank burn time is 6 plus
52 and just a reminder that if bank B doesn't burn, we are
expecting you to go into lunar orbit on bank A.

SC Okay, Carl, LOI pad readback: SPS G&N 66244
plus 121 minus 012 078 31 4591 minus 28975 minus 07764 minus
00441 all zeros for roll, pitch, and yaw; 01696 plus 00584
30001 641 29939 25 2671 228; Vega, Deneb, 264 090 349 no ullage;
LM weight 36 258; single bank time: 6 plus 52.

CAPCOM That's all correct. And it's your computer
now 15.

SC Oh, rog, and we also understood that if bank A
doesn't light, we'll take it on in with Bank - I mean if Bank B
doesn't light, we'll take it on in with bank A. We don't need
to discuss that.

CAPCOM Roger.

PAO This is Apollo Control at 77 hours 36 minutes.
We've just passed up the final LOI burn pad to the crew.
Ignition time 78 hours 31 minutes 45.91 seconds. Delta V, or
change in velocity of 3000.1 feet per second; burn time of
6 minutes 41 seconds; the expected resulting orbital parameters
169.6 by 58.4 nautical miles. And the flight director has
updated by a few seconds the acquisition times after LOI.
The loss of signal time remains the same: 78 hours 23 minutes
31 seconds. The no burn acquisition time is 78 hours 46 minutes
44 seconds. And the nominal burn acquisition time is 78 hours
55 minutes 03 seconds. Apollo 15 now 2368 nautical miles from
the Moon; velocity 5368 feet per second. At 77 hours 38 minutes,
this is Mission Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/29/71, 14:13cdt, 77:38get, 208/1

CAPCOM 15, this is Houston. I have a map update, when you have time to copy.

SC Okay. Stand by one please.

SC Houston, 15. I'm ready to copy the map update.

CAPCOM Roger, 15. I have 4 times for you beginning with LOS. 78 23 31; 78 33 27; 78 55 03; 78 46 44. That's all.

SC Copied. 78 23 31, 78 33 27, 78 55 03, 78 46 44.

CAPCOM That's correct.

PAO This is Apollo Control at 77 hours 57 minutes. Telemetry shows that Apollo 15 has maneuvered to the maneuver attitude - the burn attitude. Spacecraft is now 1431 nautical miles from the Moon and velocity has increased to 5966 feet per second.

PAO This is Apollo Control at 77 hours 59 minutes. The Guidance Navigation and Control Officer reports now that Apollo 15 has completed the sextant star check.

CAPCOM 15, this is Houston. Everything is looking in good shape down here and you have a go for LOI.

SC Rog, Houston, 15. Understand. Go for LOI.

CAPCOM And a note here from ECOM that due to de-stratification in your oxygen tanks, you may get a cryo pressure light; don't worry about it. That's during the burn.

SC Okay. Rog. Understand. The cryo pressure.

PAO This is Apollo Control at 78 hours 07 minutes. Apollo 15 now is less than 1000 miles from the Moon; distance 985 nautical miles; velocity 6428 feet per second. We're 15 minutes 45 seconds away from loss of signal as Apollo 15 will go behind the Moon. We're 23 minutes 50 seconds away from ignition of the lunar orbit insertion burn. At 78 hours 08 minutes, this is Mission Control, Houston.

PAO This is Apollo Control at 78 hours 10 minutes. The viewing room behind the Mission Operations Control Room is beginning to fill up now, as we near the loss of signal. All of the Flight Directors are beginning to assemble in the Control Room proper.

PAO This is Apollo Control. We're 5 minutes away from loss of signal now and Apollo 15 is 490 - 484 nautical miles from the moon; velocity 7185 feet per second.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/29/71 GET 78:20 CDT 14:54 209/1

CAPCOM 15, this is Houston.
SC Houston, 15. Go.
CAPCOM Gentlemen, everything looks perfect down here
and all we can say is "Have a good burn."
SC Okay, thank you. We'll see you on the other
side.
CAPCOM Roger.
PAO One minute to LOS.
PAO And we've had loss of signal. And at that
time we showed Apollo 15 293 nautical miles from the moon,
velocity 7624 feet per second. We'll take this line down
now and come back up just prior to the no burn acquisition
time. That's 78 hours 46 minutes 44 seconds. We'll come
up just prior to that time and stand by. At 78 hours
24 minutes this is Mission Control Houston.

END OF TAPE

PAO This is Apollo Control at 78 hours 45 minutes. We're about a minute and a half away from the no burn acquisition of signal time. If we get a signal at that time it will mean that Apollo 15 did not perform the lunar orbit insertion burn. We're 9 minutes and 38 seconds away from acquisition time for a normal burn. Of course if we get a signal anytime between those 2 times, it will mean that Apollo 15 has had a partial lunar orbit insertion burn. We'll stand by live through this period.

PAO We're 15 seconds past the no burn signal time now and still don't have a signal. We're a minute and a half past the no burn acquisition time now, so it's obvious that Apollo 15 has done a burn. We'll continue to stand by live up through the nominal acquisition time. I believe Goldstone has AOS. No that signal was from the S4B instrument unit, not the spacecraft. We're 3 minutes away from the nominal acquisition time now. 1 minute to go, 10 seconds. AOS on the command service module. We'll allow a little time now for antenna lock up before attempting to talk to the crew but we did get acquisition of signal on time, indicating a good burn.

CAPCOM 15, this is Houston. How do you read?

SC Hello Houston, the Endeavour's on station with cargo, and what a fantastic sight.

CAPCOM Beautiful news, romantic isn't it.

SC Oh, this is really profound, (garble) fantastic.

PAO First words from Dave Scott in lunar orbit.

SC (garble) report for you.

CAPCOM Okay, we're ready to copy when ever you're ready to give it.

SC Okay, I think our trusty pilot has a first for you on this one. Burn time was 6 plus 38, ignition was on time, the residuals were 0, 0, and 0. Delta vc, minus 4.8. The fuel 33.25, the oxidizer 33.3.

CAPCOM That's a beautiful job up there.

SC And it was a very smooth burn all the way, Karl. There was not a ripple. I guess the only little thing we might comment on was that we had a little PUGS operation after 6 minutes.

CAPCOM Okay, we copy.

SC And Houston, after our first few minutes of looking here. I don't think we'll have any trouble at all finding new things for you for 6 days.

CAPCOM Good enough. 15, Houston, we'd like to know the position of the PU valve and also the unbalance meter reading.

SC The PU valve is in decrease right now. The unbalance is reading about 25, and I put it in the increase position for about 10 -

END OF TAPE

SC 25 and I put it in the increase position for about 10 seconds after 6 minutes.

CAPCOM Okay, Jim, we copy.

PAO This is Apollo Control at 79 hours 3 minutes. Very early look at the orbit shows the parameters 170.1 by 57.8 nautical miles. This is a very early rough look and will be refined. This is Apollo Control. We'll explain the clocks on the TV monitors in the News Center. The top clock is counting to loss of signal time, on the spacecraft 1 hour 13 minutes 5 seconds from now. The bottom clock, identified with the initials ET is counting down to S-IVB impact, 17 minutes 24 seconds from now. This is Apollo Control. The Apollo 15 crew will not be able to see the S-IVB impact. The impact point is in darkness and it is too far away from the spacecraft location.

CAPCOM 15, Houston.

SC Houston, 15.

CAPCOM We've just got through with the playback and we've got excellent burn data down here. And if you'll give us ACCEPT we'll send of a REFSMMAT.

SC Okay, you've got POO and ACCEPT.

CAPCOM Thank you.

SC And Houston, we're over Mare Crisium at the present time, and the sights are really striking. I guess some of the interesting things we've noticed is the variation in albedo from white to dark grey with many variations of grey in between. And many times this albedo change appears without any significant change in topography other than perhaps a mountain ridge or a chain or a wrinkle ridge or something, but (garble) variations in the albedo all over the surface. I guess our general consensus is that it's grey. We haven't noticed any brown yet.

CAPCOM Excellent. If I'm not mistaken this is probably the first time men have been over Crisium.

SC I guess that's probably right. We have everything from the very old subdued craters that are almost completely washed out to the very bright fresh ones which have interior walls of almost pure white.

CAPCOM We are laughing it up down here, keep talking if you feel like it.

SC Another interesting fact that we've all noticed, it looks like a great desert across which we've had a number of dust storms and in many places you can see the tracks where the swirls across the surface which looks like a great dust storm has been blowing across the surface. Primarily indicated by the albedo change but all over Crisium you can see the streaks which obviously are from

APOLLO 15 MISSION COMMENTARY 7/29/71 GET 78:59 CDT 15:29 211/2

SC impact at some point or another, but the
impression we get is that it's a result of a dust storm.
CAPCOM Very interesting. 15, the computer's yours.
SC Say again.
CAPCOM The computer's yours.
SC Okay.
SC Karl, this is Al, I'd have to say pretty
much what Dave's been saying. You might be interested to
know that we're coming up over Pierce right now, and just
about to hit the west rim of Mare Crisium and kind of looking
forward to taking a look at Proclus as we get up a little
bit closer here. There are a couple of craters just to the
north.

END OF TAPE

SC - - it'll look Proclus as we get up a little bit closer here. There are a couple of craters just to the north - northeast corner, and we'll pin point those a little better for you later. A very very small crater that looks like that looks like it has had some dark material slide down into the crater. The eastern wall of the inside of the crater had some very dark material in it, and at this sun angle it doesn't appear that it's shadow.

CAPCOM Okay, we copy.

PAO That was Al Worden.

SC And you know as we look at all this after the many months we've been studying the moon, and learning all the technical features and names and everything why when you get it all at once it's just absolutely overwhelming. There are so many different things down there, and such a great variety of land forms and stratigraphy and albedo that's it's hard for the mental computer to sort it all out and give it back to you - I hope over the next few days we can sort of get our minds organized, and get a little more precise on what we're seeing. But I'll tell you this is absolutely mind boggling up here.

CAPCOM Gentlemen, I can well imagine that a foreign planet must be a weird thing to see.

PAO That was Dave Scott.

SC And we've got Proclus in view right now.

CAPCOM Excellent tell us about it if you have a chance.

SC Well, the rays extending from Proclus are very light in color for about - their light color for about 240 and 260 degrees around and then there's a region of dark mare or albedo. And our orientation presently with the spacecraft is such that we have - we're having a tough time figuring out north and south and once we get on an orbit track we'll be able to give you direction a little bit better. But the inner walls of Proclus are very light in color almost white. The outer walls - the outer ring has a somewhat light gray appearance and the difference in the rays is really between a light and a dark gray as distinguished from the inner walls which are quite white. The walls exhibit some debris on the upper slopes - maybe the upper 30 percent. I can see on one side of the crater some large blocks on another side I can see what appears to be a large slump block or a large slumping of the wall that goes about half way down. And takes about - oh 15 degrees of the rim of the crater with it. The floor is very irregular and rough almost a constant gray - medium gray color somewhat darker than the light gray on the outside rays and somewhat lighter than the dark gray on the surface which does not seem to be covered with a ray pattern. There are a few ridges on the floor, arduous

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SC ridges, and some domes which are quite prominent. And I'm sure when Al comes back over here later on and has a chance to study it carefully he can give you a good accurate picture.

CAPCOM Beautiful.

PAO This is Apollo control. Science commentary on the S-IVB impact will be available in the news center briefing room. The commentator will be Dave Strangway from the MSC Science Directorate.

CAPCOM 15, we would like to have a track to auto on the HIGH GAIN, and for your information the Saturn IVB impact is going to take place in just a few minutes. It's going to be a - -

SC Okay, very good. I wish we were in a - -

CAPCOM Right. It's 2 minutes 40 seconds, but it's going to be out of your visual range somewhere around the center area of the moon.

SC Rog. It's too bad we won't get to see it. We had already taken a look at the map to see if we'd have a chance, but I guess we'll miss that one.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/29/71 7922 GET 1556 CDT MC213/1

SC --you should see it. We had already taken a look at the map to see if we have a chance, but I guess we'll miss that one.

PAO This is Apollo Control. The seismometer recorders on the monitors in the News Center are giving you a display of the Apollo 14 seismometer - the seismometer on the Apollo 14 ALSEP pack.

SC Houston, 15, we're coming up to Serenitatis and it really looks like an ocean. The land forms as we approach are very rugged, very highly cratered, rounded, and we get to the shore line and we see a few wrinkled ridges that have smoothed out. And we can see on the far side on the horizon the mountains which pick up again on the western side of Serenitatis.

CAPCOM Roger 15.

SC Okay, Carl, we're coming up over Serenitatis now; we're almost over LeMonnier and we can see the Littrow area just out in front of us and it is, in fact, about three different shades. You can see in the upland area, particularly what looks like down in the valleys, a darker color and it does look like it's a light powdering or dusting over of the entire area. And then as you get out further into Mare Serenitatis, there's another layering which is a little bit lighter in color. And then out at the last edge of the wrinkled ridge, out beyond that is the last layer, and the rest of Serenitatis looks fairly light in color. So, I'd say that the central part of Serenitatis is light, out beyond the first wrinkled ridge is a darker layering and we're not up close enough to see what it is yet. And then as you get up into the highlands around LeMonnier and Littrow area itself, there's what appears to be a light dusting of dark material, and it certainly looks volcanic from here. Off to the left of that, to the south, we can pick up Sulpicius Gallus pretty clearly right now.

CAPCOM Roger, Al, sounds like you're seeing a marvelous amount of detail up there.

SC Well, after the king's training, it's almost like I'd been here before.

CAPCOM You can't help yourself, can you.

SC And, Karl, we're approaching the Apennine Mountains and that is indeed a spectacular view.

CAPCOM Roger --

SC No question about those mountains being there and where we're at with them.

CAPCOM They stand up on your horizon, do they?

SC Yeah, tremendous relief as we approach the mountain, Karl.

CAPCOM Roger. And for your information gentlemen, we're getting a good seismic signal from the impact of the --

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CAPCOM --Saturn LVB.

CAPCOM 15, this is Houston, there is no update required on your TEI4 pad.

SC Okay, Houston, understand. Houston, as we cross out of Serenitatis into the Apennines, why it's just unreal - you know those are very poor descriptive terms, but the mountains jut up out of the ocean here in great relief. I'm sure the guys who've been here before can probably sit down over a cup of coffee and tell you. But the relief is really pervasive.

CAPCOM You're the first man to fly over this mountain range, Dave. I guess pretty soon you're going to be over the, over the landing site, aren't you?

SC Rog, but I'm afraid it'll be dark today.

CAPCOM Rog, right.

SC Karl, this is Al again. Looking down into the Sulpicius Gallus area, looking at some of the wrinkled ridges and some of the rilles, arcuate rilles down there, I can make out some distinct color patterns that seem to run parallel to the arcuate Rilles. And along the wrinkled ridges there is a very subtle darker color again almost as if it was some kind of cinder fallout along the ridges and along some of the rilles.

CAPCOM Roger.

END OF TAPE

SC And Houston, we're coming up here on the terminator and the area, I guess we call crackled hills really looks like crackled hills. If you distinguish between the mountains which are very prominent and smooth, the surface between the first small mountain range and, what is now the terminator, it's relatively flat with a very rough texture, a very irregular, lower crackled hills.

CAPCOM We copy Dave.

SC Jim calls it a gun metal gray and that's a very good term I think for the color that we're seeing now. And as we approach the terminator, of course the release stands out even more. The shadows are getting much longer, and the peaks of the mountains, as they're silhouetted against the crackled hills seem to have a diffuse shadow at the top. The shadow, as it goes from the base of the mountain to it's peak is very sharp, and around the top of the mountain it becomes more diffuse, not quite as sharp and it begins to blend in with the surface on which it's being cast.

CAPCOM Roger Dave, sounds very interesting.

SC Houston, we're trying to get oriented here so we can perhaps pick out some of the features near the landing site. There's quite a bit of shadow now, but we have Aristillus and Autolycus very clearly and with a low sun angle the surface between those two large craters and the rim of Imbrium, the eastern rim of Imbrium is very rough, quite a bit of debris and it looks like it probably came out of the two craters. I believe we can see Hadley C, just barely in the shadows.

CAPCOM Roger 15, we copy that. Did I understand that the rim of Autolycus is standing up in the sunlight?

SC Yes that's true. Aristillus and Autolycus both have their eastern rims exposed to the sunlight and we get a pretty good look at the elevation on the rim, and Autolycus, to it's north eastern side seems to have a saddle or somewhat depressed rim, and as you come around to the eastern side of Aristillus it seems to be relatively level, or horizontal with a few subtle saddles and depressions. Autolycus appears to have a relatively horizontal or even rim all the way around, and we can see some light on the northwestern side of Autolycus on the rim, just barely a tic of it.

CAPCOM Roger, it sounds like a fantastic view.

SC It really is.

CAPCOM Do you guys have enough to keep you busy for a few days then?

SC Hey Dick, we've got enough to keep us busy for months, and months, and months, as you well know. The outer rims of Aristillus and Autolycus seem to be quite heavily cratered and rough and Aristillus, on it's east, northeastern side seems to have a couple of benches on the outer rim as it goes down to the surface, and the shadows are exposed quite well.

CAPCOM Roger, Dave.

SC Houston, just north of Conon, there's a great depression in the mountains, the low part of the mountains. In the- the western side of the mountains is exposed to sunlight, and this reflects back in to the shadowed part of the mountains which, the base, basin just north of Conon there, is really shadowed by the eastern mountain range but the reflectivity back from the mountains exposed to the sunlight illuminates the shadowed area to where we can pick out craters and ridges and various other topographic features. It's really quite interesting. As a matter of fact just to the inner walls, or the inner basin of Conon itself is illuminated by its own reflectivity on its western wall.

CAPCOM Roger, that sounds like a fascinating -

END OF TAPE

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CAPCOM Roger. That sounds like a fascinating illumination. Do you have any inclination that you're going to be able to see the dark side of moon with earth light on it?

SC Well, we can just barely see some of the features now I think. We can see the horizon quite clearly.

CAPCOM Roger. When you get dark adapted it may be that things will come through pretty well.

SC Rog.

PAO This is Apollo Control. The Flight Dynamics officer, Bill Boone, reports that after tracking from acquisition of signal, the orbital parameters are 169 by 59 nautical miles.

CAPCOM 15, this is Houston.

SC Rog, Houston, 15. Go.

CAPCOM Jim, the people down here would appreciate it if you could give them something of a description of the operation PU valve during the LOI burn.

SC Roger, Karl. There was no operation of the PU valve at all until crossover and then at crossover it required a decrease, and then at about 5 minutes and a half into the burn it started to increase and I went to the increase position at that time. All the operation of the PUGS manual operation occurred after crossover.

CAPCOM Okay, we copy.

SC And as I mentioned about 5 and a half I went to 5 and a half minutes I went to neutral and then the - it looked like the unbalance was going to go - it was rapidly departing the zero region and that was about the time we went through 6 minutes and I put it into minimum at that time. Into the decrease position.

CAPCOM Okay, Jim. That answered our next question. And 15, the people down here were very much turned on by your description of the swirls on the floor of Crisium. We trust you got some good photography of that and if you didn't they'd very much appreciate having some next time around.

SC Okay. We were discussing our photography and we're going to try and stay as close to the preplan photos as we can and not over extend ourselves into what's already planned for the six days. But we will use our spare film judiciously for the kind of things you hear us talk about that you'd like pictures of.

CAPCOM Sounds very good.

CAPCOM 15, this is Houston. Joe just came up from below to tell us that Farouk and Company are ecstatic about what you've told them so far, and that all of the SIM Bay experiments are looking to be in excellent shape.

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SC Okay, thank you Karl, that's good news.

PAO This is Apollo Control at 80 hours 4 minutes.

CAPCOM 15, we have your torquing angles.

SC Roger. Torques on the minute.

PAO This is Apollo Control. In the transmission a few minutes ago the Joe referred to was Dr. Joe Allen, a scientist astronaut, who is the Mission Scientist for the Apollo 15 crew on this mission. The Farouk to whom Karl Henize made reference is Farouk El Baz, a geologist who has a great deal to do with the training of the crew.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/29/71 GET 80:05:15 CDT 16:54 216/1

PAO And we're 15 minutes away from loss of signal on this first revolution of the moon. This is Apollo Control at 80 hours 8 minutes, we show Apollo 15's present altitude as 92 nautical miles, velocity 5,316 feet per second.

CAPCOM Apollo 15, This is Houston.

SC Houston, Apollo 15, go.

CAPCOM Just to firm up our interest in those swirls on the floor of Crisium, the words we'd like to send up is that it would be nice to get a 3 photo convergent stereo sequence on it, and if you'd like a setting, we recommend. .

SC Okay, 3 photo go.

CAPCOM Roger, and if you'd like settings, we recommend F8 at 1 250th with a 250 millimeter lens.

SC Okay Houston, understand swirls on Crisium, 3 photo convergent stereo F8 1 250th with a 250.

CAPCOM Roger. And now, you wanted us to remind you about your helmet and gloves when you take shots of Ingenuity this time around.

SC Okay, we'll tell him.

CAPCOM And otherwise, we have nothing more down here, everything is looking in great shape and have fun on the back side.

SC Okay, Karl, thank you, we will.

PAO This is Apollo Control at 80 hours 20 minutes. We've had loss of signal as Apollo 15 goes behind the moon. We'll take the line down and come back up just before acquisition on the second revolution. At 80 hours 20 minutes this is Mission Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/29/71 GET 81:03:00 CDT 1737 217/1

PAO This is Apollo control. Doctor Gary Latham the Principal Investigator on the passive seismic experiments on the lunar surface will hold a news conference in the Apollo news center briefing room in about 5 minutes, to discuss the S-IVB impact seismic signals received a short while ago. To repeat Doctor Gary Latham will hold a news conference in the Apollo news center briefing room in about 5 minutes to discuss the seismic signals received from the Apollo 15 S-IVB impact. This is Apollo control at 81 hours 2 minutes. We're a minute away from acquisition of signal time for Apollo 15 on its second revolution of the moon. We'll stand by live now for first words on this rev. We do have a signal, we'll wait until we have good antenna strength to attempt to talk to the crew.

END OF TAPE

CAPCOM 15, This is Houston.
SC Rog, Houston, looks like we're getting
locked up.
CAPCOM Roger, that looks better now.
SC Houston, 15.
CAPCOM Go ahead, 15.
SC Okay, Karl, I got a minute here waiting on
Crisium to show up, I'll give you a run down on what we've
done so far.
CAPCOM Go ahead.
SC Okay, we got the strips of photos of the Sea
of Ingenuity or Ingenuie, and took a look at the light
colored swirls in the bottom of the Mare, I couldn't tell . .
no elevation associated with those light colored swirls,
they are very distinct when you look at them from this
angle. Also . . looked at the . . at the area just adjacent
to Ingenuie, there is a very definite valley that cuts
through the edge of the wall there and with what looks like
a rille in the bottom whats been described as Vallis Alpha
Reed, I guess it is kind of unique, its the only one we've
seen on the back side so far. We took some pictures of
the rim deposits and then took a couple of shots going on
up to dumbell. After that we got set up for a keyhole, took
some convergent stereo on keyhold and got a couple of shots
of the bright one along with some general pictures to show
the ejecta pattern, although I'm afraid that ejecta pattern
on the bright one is not going to show up too well.
Its very bright but its also such a large area its kind of
indestinctive to definition, and then took a couple of what
I hope will be convergent stereos of the rooster tail along
by Tangor and then got on to Ebenuitus Al-Biruni Goddard
complex and took some convergent stereos of the squirrels
to the west of Ebenuitus and to north and west of Goddard.
And now we're looking for the ones in Mare Crisium.
CAPCOM Roger, sounds like you did it up brown.
SC Well, it does look sometimes brown, sometimes
gray, Karl. But we'll see when we get back.
CAPCOM Hey, lets keep those colors straight, fellers.
CAPCOM 15, we can take high gain to auto now.
CAPCOM 15, we need to go back to react on the high
gain.
SC Rog, react.
SC Houston, 15.
CAPCOM 15, Go ahead.
SC Okay, Karl, just a couple of general observa-
tions on Crisium, while we are coming up on it. Proclus

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SC coming up from the east is really spectacular and very . . . distinctly see the difference in the color of the albedo in the excluded zone of Proclus and as you are coming up across Crisium with Proclus the head, you can see the ray pattern very distinct extending out across Crisium and follow the ray patterns almost as far as you like. And the excluded zone in the ray pattern is just very distinct at this point.

CAPCOM Excellent.

END OF TAPE

SC And, Houston, from this angle looking at Proclus about a crater diameter out, maybe a diameter and a half or so, you can see many small bright fresh craters, which appear to be in the general direction of a ray like part of the ejecta blanket.

CAPCOM Roger, Dave. You mean to say that these small bright craters seem to be clearly related to the ejecta blanket. Is that correct?

SC That's the impression I get. They occur within a diameter to a diameter and a half of Proclus and they're about the same brightness as the inner walls of Proclus. They're just small craters. I don't see any - yes I do see one which you might call loop, which would suggest secondaries. They just seem to lie in the general direction of the rays of the ejecta from Proclus.

CAPCOM We copy.

SC They're sort of localized to one area which is probably on the western side of Proclus, northwest side.

CAPCOM We copy that. Do these small bright craters have more or less a uniform size or do they come in varied sizes?

SC I'd say, Karl, yeah, I'd say they're various sizes.

CAPCOM Okay.

SC Yeah, there is I guess it depends, Karl, on what do you mean by sizes. There are various sizes within certain sorting. They seem to be fairly well sorted within one range. But within that range there is a distribution. And they're all much much smaller than Proclus.

CAPCOM Okay, we copy.

CAPCOM 15, this is Houston. And if you'll give us ACCEPT, we'll send up a state vector and a target load.

SC Roger. You have it.

CAPCOM And 15, we don't require a pipa bias check at this time. And I have a terminator photo pad when you're ready to copy.

SC Okay, stand by 1. I'm ready for the terminator photo pad, Karl.

CAPCOM Roger. The key start is 81 44 10, and there's a note here that the PCM cable may not reach to window 3. And if it doesn't go ahead and run on the intervalometer alone. And this pertains to all future photography in window 3.

SC Roger. We understand.

CAPCOM 15, we'd like to go to auto again and go directly from REACQ to AUTO without a pause.

SC You're in AUTO.

CAPCOM The high gain looks good this time, thank you.

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CAPCOM 15, Houston. When you can copy I have both
a DOI pad and a TEI 5.

SC Standby 1, Karl.

SC Okay, I'm ready to copy the pads.

CAPCOM Roger. DOI. SPS G&N 39800 plus 168 minus
055 082 39 4829 minus 02084 minus 00480 plus 00020 000 283 347
00584 plus 00092 02139 024.5, Delta-VC is 02084 33 1442 357,
the rest is NA. Set stars Vega and Deneb 288 340 346 ullage
is 4 quads 15 seconds, 15 seconds. And the computer is yours.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/29/71 8133 GET 1807 CDT 220/1

SC Okay, Karl, if you're ready here's the readbacks for the DOI pad. SPS/G&N 39800 plus 168 minus 055 08239 4829 minus 02084 minus 00480 plus 00020 000 283 347 00584 plus 00092 02139 024.5 02084 33 1442 357 Vega/and Deneb 288 340 346 4 quads 15 seconds.

CAPCOM That's all correct. And your next is a TEI5 pad.

SC All right, go ahead.

CAPCOM TEI5 SPS/G&N 38206 plus 058 plus 101 088 25 4709 plus 28643 minus 12277 minus 03170 180 091 338; the rest is NA set stars Vega and Deneb 288 340 346 4 jets 12 seconds. This - comments are that the burn is undocked and it assumes DOI.

SC Okay. TEI5 readback. SPS/G&N 38206 plus 058 plus 101 088 25 4709 plus 28643 minus 12277 minus 03170 180 091 338; Vega and Deneb 288 340 346 4 jets 12 seconds. Undocked and assumes DOI.

CAPCOM That's all correct.

PAO This is Apollo Control at 81 hours 37 minutes. CAPCOM Karl Henize has just read up the information on the descent orbit insertion burn to the crew.

SC Apollo 15.

CAPCOM 15, go ahead.

SC Okay, as a quick review here, DOI is a single bank burn on B with nominal procedures with the exception of having the A pilot valve open.

CAPCOM That's affirmative and if we have no ignition we'll postpone the burn and rev.

SC Roger, I understand.

PAO This is Apollo Control. Ignition time for the DOI burn 82 hours, 39 minutes, 48 seconds; DELTA-V 213.9 feet per second; duration of the burn 24.5 seconds; the resulting orbit target at 4 - 58.4 x 9.2 nautical miles. Again, this burn will be done behind the moon while we're not in contact as was the lunar orbit insertion burn. We'll continue to stand by live monitor air and ground.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/29/71 GET 81:39:00 CDT 1813 221/1

CAPCOM 15, this is Houston. We're showing a low voltage on the battery relay bus down here. We think it's just a matter of instrumentation, but there's a couple of procedures we'd like to run through here to check it out.

SC Go ahead, Karl.

CAPCOM Okay, first of all we'd like read - have an on board read out of the battery relay bus voltage which is B5 on the test meter.

SC Okay. That 5B.

CAPCOM Roger.

SC Reading 2.4, I'm sorry 1.4, 1.5.

CAPCOM Roger, that reading.

SC Okay, Dave moved the - stand by. Dave (Garble) wiggled the selector to the right that's on B and the position that (Garble) on each position and now we're reading 3.5.

CAPCOM Roger and we just recovered our read out on - we got a good voltage reading down here now.

SC Real good.

CAPCOM Okay, thank you. We'll think on it for a while and everything looks - everything looks fairly normal.

SC Roger.

CAPCOM 15, we have only 1 more question on that problem, and can you tell us what position you were in before you went to 5B on the test meter.

SC B was selected, Karl, but Dave moved the selector out of - just barely out of B and back into the B position to obtain the higher reading.

CAPCOM Roger, and what about the numerical site was it in 5?

SC Yes it was.

CAPCOM We copy. Thank you.

CAPCOM 15, this is Houston. And I have a map update for rev 3.

SC Stand by one com. Okay, go with the map update for rev 3.

CAPCOM Roger. LOS 822816 180 is 824842 AOS is 831454.

SC Okay, understand. LOS 822816, 180 degrees 824842, AOS 831454.

CAPCOM Roger. And while your on that page, I have information for the landmark J1 observation.

SC Okay, go ahead.

CAPCOM Thor is 8833933, TCA minus 20 834125.

SC Okay, understand. T horizon at 833933, TCA minus 20 834125.

CAPCOM That's correct.

CAPCOM 15, this is Houston.

SC Houston, 15. Go ahead.

CAPCOM It's our understanding that we'd agreed that

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CAPCOM you'd send down magazine numbers and final
frame numbers on each path on this photography and if your
in agreement with that, we'd like to have the magazine number
on the orbital photography and also on the terminator
photography.

SC That's all the agreement's that I've got with
Spencer, Karl. I think right now we're too busy to do that,
and as we get the landing out of the way we'll go back and
recap all the film and start from scratch.

CAPCOM Very good.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/29/71 GET 81:56 CDT 18:30 222/1

CAPCOM 15, we have your torquing angles.
SC Rog. Torque one a minute.
CAPCOM 15, this is Houston.
SC Houston, 15.
CAPCOM One more comment on the battery relay bus voltage from all indications it is indeed an instrumentation problem, but we have one more question and that is to confirm that the main A - main bus A and main bus B fuel cell talk-backs are normal and have been normal during this period.
SC Yes. That's affirmative, Karl, they have been normal.
CAPCOM Thank you. And at the present time all the systems otherwise are looking fine and you're go for DOI.
SC Okay, understand. Go for DOI.
CAPCOM 15, this is Houston. We'd like to verify over on panel 226 that the 02 tank 50 watt heater circuit breakers 1 main B and 2 main A are open. And if they're not open, let's open them.
SC Okay, the two circuit breakers that are open are 02 tank heaters 50 watt, 1 main B and 2 main A.
CAPCOM Roger. I understand they have been open. Is that correct?
SC That's correct.
CAPCOM Okay, the reason we ask is that the temperatures weren't quite as we expected. Thank you.
CAPCOM Apollo 15, Omni. Omni Delta please, and we'll go to Charlie a little bit later.
SC Roger. Omni Delta.
CAPCOM 15, this is Houston. As you go around the corner we'd like to verify that all systems are in good shape. And that the data you have in the flight plan for bail out burn all stand as recorded. The no burn AOS you may be interested in is 83 11 14.
SC Roger, understand. And we ran all the systems checks up here and everything looked good and I copied the AOS time.
CAPCOM Excellent.
PAO This is Apollo Control at 82 hours 28 minutes. We've had loss of signal on Apollo 15's second lunar revolution. We'll acquire Apollo 15 on it's third revolution after the decent orbit burn at 83 hours 14 minutes 54 seconds. If there is no burn acquisition time will be 83 hours 11 minutes 14 seconds. At 82 hours 29 minutes, this is Mission Control Houston.

END OF TAPE

PAO This is Apollo control at 83 hours 9 minutes. We're about a minute 45 seconds away from the no burn acquisition time. We'll stay up through that period, and up to the normal time. We're about 5 and a half minutes from the nominal AOS time given a DOI burn. We do have an announcement. Astronaut Jack Smith, who is the backup lunar module pilot for Apollo 15 will hold a news conference at 8 AM tomorrow in the MSC main auditorium. Subject will be the Apollo 15 EVA's on the lunar surface. We've passed the no burn AOS time, now with no signal. 3 minutes 30 seconds away from AOS on a nominal burn. We have AOS on the Command Module.

CAPCOM 15, this is Houston.

SC Hello Houston, Apollo 15. The falcon is on its perch.

CAPCOM Good to hear you coming around that corner. How do things look?

SC Okay burn status report. Burn was on time. Burn time was about 24.0 about half a second short of what we predicted. There was no tramp, residuals were plus .6, plus .0, minus .1, DELTA-VC minus 4.4, fuel 29 - 29.25 and the oxidizer 29.55 unbalance 100 increase.

CAPCOM Thank you, Dave. We copy all that.

SC And I'll tell you it's really spectacular when you can see the central peak Tsiolkovsky coming up over the horizon before you see the rim.

CAPCOM Hey, that's an interesting astrophysical observation.

SC And, 15. The G&N had us in a 58.4 by 10.0.

CAPCOM We copy 15.

SC Houston, 15. We're in an attitude now which we cannot see the surface. But our initial impressions after the burn when we could see the surface is that we were rolling in on a high angle pass.

CAPCOM We copy, 15.

SC And, Al just added we were.

CAPCOM True enough, true enough.

CAPCOM 15, this is Houston. Your stay in the DOI orbit and we have an orbit for you of 58.8 by 9.5.

SC Very good, Houston 58.8 9.5 and we're stay, thank you.

CAPCOM 15, you have a go to proceed to the landmark observation attitude.

SC Roger, Houston. Thank you.

CAPCOM And would you please give us auto on the HIGH GAIN.

SC Auto.

END OF TAPE

SC Okay, Houston, 15. We've got a little bit of visibility now and we're down in Crisium.

CAPCOM Roger 15.

SC And it looks like we have enough altitude to get up over the western rim.

CAPCOM Yea, I sure hope so.

SC But it sure looks like we're looking up at some of those billows out there.

CAPCOM That must be sort of exciting skimming along down there over the waves.

SC That's a mild word for it.

CAPCOM Hey, can you see anything more about those swirls? Anything interesting?

SC No, we're too close, and right now I've just finally picked out the rim of Proclus, and we're just about level altitude wise with the rim of Proclus. I can not see down into it. I can see just a tad of the southern wall. I guess we're just north of it. I can see some large blocks on the outer wall.

CAPCOM Roger.

SC But I'd say we're definitely at an altitude even with the top of the rim of Proclus. Okay, Houston, we're coming up on the edge of Serenitatis now and I can look out see a rill that runs parallel with the eastern edge. We're taking some pictures.

CAPCOM Roger, I suspect that's Littrow rill, and after Littrow rill you should be coming up on Monge. Do you have much chance of seeing down at that angle?

SC I doubt it, Karl. At this attitude for the landmark track and the windows are almost out of it. Jim's got some visibility out window 5. Karl, we just passed the wrinkled ridges about a quarter of the way across Serentitatis and there is definitely a topographic high in the middle of the wrinkled portion.

CAPCOM Roger, 15, we copy. Are those ridges smooth, or do they show signs of lots of cracks in them?

SC I was impressed with the smoothness of the base portion.

CAPCOM Roger.

SC Okay, I'm taking several pictures of the wrinkled ridges, that run roughly north and south in Serentatis.

CAPCOM Excellent Jim.

SC And in the one that we just passed over, there were some vertical fractures, some vertical relief in the smooth portion of the raised wrinkled ridge. The fractures were also running north and south.

CAPCOM Roger Jim, we copy.

APOLLO 15 MISSION COMMENTARY 7/29/71 CST1957 GET83:23:20 224/2

SC Rog, this is a spectacular view as we glide across the Sea of Serenity, and I'm taking a picture now of a (garbled) rill off to the north.

CAPCOM Roger, Jim.

SC Okay, we're approaching the mountains now on the western side of Serenitatis. At this point, there's a wrinkled ridge running to the northwest.

SC Karl, this is Al.

CAPCOM Go ahead Al.

SC Karl, this is Al.

CAPCOM Go ahead Al.

SC Okay, Karl. I just finished the observation on J1, and everything looked fine from my stand point. I could track it very smoothly, and in fact, I took a couple of marks on it I think will interest you.

CAPCOM Very good and we have them down here.

SC Okay.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/29/71 GET 83:43 CDT 20:17 225/1

CAPCOM We were sitting down here wondering how you were ever going to find that little bugger. No trouble, huh?

SC Not that much trouble, Karl.

CAPCOM Very good.

SC Seemed like there was plenty of time waiting on it.

CAPCOM 15, does it look like you are going to clear the mountain range ahead.

SC Karl, we've all got our eyes closed, we're pulling our feet up.

CAPCOM Open your eyes, that's like going to the Grand Canyon and not looking.

CAPCOM 15, This is Houston, I have the camera photo pads.

SC Okay, stand by. We're just noticing the cabin temp here and also that the outlet temp is up to about the glycol temp is up to about 70.

CAPCOM We copy and ECOM says that's normal and they are are on their way down now.

SC Okay fine, thank you. Karl, I'm ready to copy the map camera vent.

CAPCOM Roger, they are in the Flight Plan at 84:32 and 84:39. Mapping camera, key start 84 42 23, key stop 84 54 14. The pan camera times are the same as the mapping cameras time and we would like to change the shutter speed at 84:24. Instead of 125th, we want one 250th at 84:24.

SC Okay, I understand 84:24, we'll change to F 250 rather than 125 and on the map pad its 84 42 23 and 84 54 14 and the pan camera path the same.

CAPCOM That's all correct.

CAPCOM 15, We have your torquing angles.

SC Houston, 15.

CAPCOM Go ahead 15.

SC Okay, Karl, I got a few numbers for you on the extension times. We started the whole thing off at 84 06 30 and got the covers open, the mapping camera extended and the extension was about 3 minutes instead of 4, then we deployed the gamma ray and the mass spec boom for barber pole plus 2 seconds. The gamma ray turned barber pole after 6 seconds and mass spec turned the barber pole immediately and I was suspicious of the mass spec, so we tried it again and got the same results, turned the x-ray on at 84:15:10 and laser altimeter at 84:15:30.

CAPCOM Roger Al, we copy.

CAPCOM 15, This is Houston. Would you verify that

APOLLO 15 MISSION COMMENTARY 7/29/71 GET 83:43 CDT 20:17 225/2

the x-ray is on?

SC 15, Roger, that's verified.

CAPCOM Thank you. No, we have not.

CAPCOM 15, This is Houston. All systems are looking good down here and until we tell you otherwise, all the AOS's are as in your Flight Plan.

SC Roger. We both like to hear that.

CAPCOM Roger.

PAO This is Apollo Control at 84 hours 21 minutes. We've had loss of signal as Apollo 15 turns the corner to go behind the moon. We will acquire on the 4th revolution at 85 hours 8 minutes 47 seconds, and as you heard in that last exchange, the scientific instrument bay, the SIM bay is in business now. At 84 hours 21 minutes, this is Mission Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/29/71 8508 GET 2142 CDT 226/1

PAO This is Apollo Control at 85 hours, 8 minutes. We're about 20 seconds away from acquisition of signal. We'll stand by.

CAPCOM 15, this is Houston.

SC Hello Houston, five by.

CAPCOM Roger, like to remind you to configure the DSE as per the flight plan.

PAO This is Apollo Control. We're getting good data both from spacecraft systems and from the SIM BAY.

SC Houston, 15.

CAPCOM Go ahead 15.

SC I figured we'd get down to the pre-sleep checklist here in about 50 minutes or so. Wonder if you might give us your best guess on the possibility of a DOI trim tomorrow.

CAPCOM Okay, we'll work on that information.

SC Okay, appreciate it.

CAPCOM Dave, we can give you a pretty good guess at that now. It seems to be unlikely that we're going to need a DOI trim. I've got a couple of trajectory numbers here if you'd like to copy them.

SC Yes, that would be interesting, go ahead.

CAPCOM Our tracking data tells us that your current orbit is 58.2 x 9.1 and tomorrow morning at wakeup time, it'll be 58.6 x 8.7.

SC Okay, that looks pretty fair. How about the outer plane at a cross track?

CAPCOM Dave, our out of plane data looks like about 2/10ths of a mile at PBI time.

SC Okay, that sounds pretty good, thank you.

CAPCOM 15, we'd like high-gain to AUTO, please.

SC Roger, high-gain to AUTO.

CAPCOM Dave, thinking about trajectories, you probably noticed the out-of-plane part of the DOI. They are telling me here that you burned a perfect LOI but the state vector they gave you was slightly in error. So, they got rid of - they made corrections for that during DOI so that we're standing pretty close to perfect now.

SC Okay, I kinda thought we did have some question about that but figured you all had a plan as you usually do.

CAPCOM Roger. Between a perfect crew in orbit up there, and a perfect crew down here, we're doing pretty good so far, knock on wood.

SC Yeah, we got a few miles to cover though.

SC Houston.

CAPCOM Go ahead 15.

SC Okay, Karl, guess I should bring you up to date on a couple of things here.

APOLLO 15 MISSION COMMENTARY 7/29/71 8508 GET 2142 CDT 226/2

SC Everything went as planned on the terminator photos, the pan camera and the mapping camera pass started on time and stopped on time. Term got the mass spect boom deployed and gamma ray boom deployed; the mass spect deployed in 2 minutes, 20 seconds and the gamma ray deployed in 2 minutes, 28 seconds. Got the ion source on and logic power off at 8505. And that brings you up to date.

CAPCOM Beautiful, Al. Sounds like all of that nice equipment is working real nice for us.

SC Sure does, Karl.

SC The answer is what kind of data you're getting down there on it?

CAPCOM Oso's two-word summary of it is that we're getting beautiful data. Incidentally, Al, if you'd like some time, let us have, say, 12 to 24 hours operation, would you like to have a summary sometime tomorrow on some of the detail?

SC Yes indeed, Karl, sure would.

CAPCOM Okay, we'll get one together.

SC Tell you what, yeah, listen, skip it tomorrow and maybe day after tomorrow we'll get a summary on that. I'll be kind of interested in how it goes myself.

CAPCOM Very good.

END OF TAPE

SC Houston, 15.
CAPCOM Go ahead, 15.
SC Roger, Karl. For your information you can see both of the - both of the booms as for extension out of window 5.
CAPCOM Hey, we're glad to hear that.
SC Yes, they sure look pretty sitting out there.
CAPCOM Roger.
CAPCOM 15, this is Houston. We'd like to have you hold off on putting the mass spect experiment switch to stand by, and we'd like to have the discriminator low.
SC Roger, Karl. We'll hold off till you cue us, and going discriminator low, now.
CAPCOM Thank you, Al.
CAPCOM 15, this is Houston. If you'll give us ACCEPT we'll send up a new state vector.
SC Roger, Houston. You have it.
CAPCOM And if you've finished with dinner up there, and somebody can copy I have a TVI 12 pad.
SC Okay, stand by a minute, Karl.
SC Houston, we're making a low pass over the Apennine, and their really something.
CAPCOM Roger. Do they look like any terrestrial mountains you've ever seen.
SC Nope.
CAPCOM How about the slopes. Are they generally steeper than you expect or shallower than you expect on something like the Teton.
SC Say again, Karl. I'm sorry we were discussing the rille at that time - Hadley that is.
CAPCOM Roger. I was just trying to get a better feel for how the mountains looked are there - are they more craggy and rougher than something like the tetons or do they give you some other appearance.
SC No, as a matter of fact from this altitude even though we're low. They appear to be smooth and rounded. There aren't any jagged peaks that we can see. And even though their cratered, and rough in texture on a small scale. They really don't look anything like the Alps or the San Juan's or any of the other familiar ranges we know.
CAPCOM Roger. Is there anything that looks like bare rock on them.
SC I think we can see some boulders, but there are no apparent jagged peaks that we can tell or that we can see from this particular altitude. Although, some of the shadows look fairly sharp.
CAPCOM Roger.
SC And, Karl, speaking of shadows. There seems to be enough light being reflected off the sides of the

APOLLO 15 MISSION COMMENTARY 7/29/71 GET 85:22:30 CDT 2156 227/2

SC mountains, now to supply sunlight down at the landing site. And the rille is quite distinctive as we pass right over it.

CAPCOM Beautiful, that must be an eerie sight in a half light.

SC Well, it was sort of.

CAPCOM And 15 you can have your computer back.

SC Roger.

CAPCOM 15, this is Houston.

CAPCOM 15, this is Houston. How do you read.

SC Loud and clear, Houston.

CAPCOM Roger. We've finished picking up data on the mass spectrometer. Leave the discriminator as it is and we're ready to go to put the experiment in stand by now.

SC Understand, your ready to put the mass spect in stand by.

CAPCOM Roger, and then you can start to put the plug in forward anytime you care to.

SC Roger, we're maneuvering now.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/29/71 GET 85:45:00 CDT 22:19 228/1

CAPCOM 15, this is Houston. Dave the surgeon would like to have a special reading of the PDR from you tonight. Your reading last night was not in agreement with the other two crew members and they'd like to get another data point on you.

SC Okay, we copy, Karl. We'll give you all three readings.

CAPCOM Roger. They'll accept them gladly.

CAPCOM 15, this is Houston. Whenever you can copy I have the TEI 12 pad.

SC Standby Karl.

SC Okay, Karl, I'm ready to copy TEI 12.

CAPCOM Roger. TEI 12 SPS G&N 38110 plus 058 plus 100 101 36 0838 plus 28450 minus 03802 minus 00638 180 107 354 the rest is NA. 4 jet ullage for 12 seconds, and this assumes the burn undocked and no circular burn and the GET of landing is 196 hours at NBL.

SC Okay, TEI 12 readback, SPS G&N 38110 plus 058 plus 100 101 36 0838 plus 28450 minus 03802 minus 00638 180 107 354 4 jets for 12 seconds, undocked no circular burn assumes landing at 196 GET at the NBL.

CAPCOM That's all correct.

CAPCOM 15, we need the mode switch in AUTO please.

SC Houston, 15. What switch you talking about Karl?

CAPCOM That's the CMC mode switch. I guess we need to get into auto before we execute this maneuver.

SC That's affirmative and I'll go into AUTO as soon as I complete the 40 degrees roll.

CAPCOM Roger.

CAPCOM 15, Houston. On the mass spectrometer operations down there at 59 minutes we'd like to have you keep the discriminator low as it is now. And as the ion source goes on we would like to have you pause in the off position until you get our cue.

SC Roger, understand. You want the discriminator left in low and want us to pause in off on the ion source on your cue.

CAPCOM Roger, and I think you know that we'd probably - we don't want to go into those operations until we have that end of the correct attitude.

END OF TAPE

CAPCOM 15, this is Houston.

SC Houston, 15, go ahead.

CAPCOM A couple of special notes on the hardware. First of all on the systems test meter. We don't fully understand why that switch did funny things for us and we have some fairly extensive tests going on down here still trying to understand it, and we suggest that you leave the meter in the 5B position until we do get some handle on what happened there.

SC Okay, Karl, we copy that.

CAPCOM Okay, and I just heard the word that if you really need it, go ahead and use it, but if don't have a strong reason for moving it, leave it as it is. And on - we're observing the radiator temperature, occasionally cycling above 80 degrees. This is out of limits and we don't really have a good solution for this at the present time. We could think about turning on the evaporator but that would foul up the mass spectrometer and we'd rather not do that. The only thing that the high temperature would be bothering, are the IMU pipas, and we have - since the temperature is cycling up and down cools off on the back side of the moon we - on the dark side of the moon, we think there's no imminent danger to that system, so our feeling on that is to leave the system as it is.

SC Okay, we understand. Houston, this is 15, with some on board readouts for you and PRD's.

CAPCOM Go ahead, 15.

SC Roger, bat C is 37 cryos, A and B are both 37.5, RCS 83, 82, 82 and 83, the PRD readings, 23072, 25014 and 08016.

CAPCOM Roger 15, now we copy all that.

SC Roger. Houston, this is 15. The ion source is off and we're standing by for your word.

CAPCOM We copy 15, stand by.

CAPCOM 15, this is Houston. Let's continue standing by on that ion source switch. We'd like to get all the way into attitude before we go into the on position.

SC Roger.

CAPCOM 15, this is Houston. We're ready for the E memory dump.

SC Okay Karl, coming at you.

END OF TAPE.

APOLLO 15 MISSION COMMENTARY 7/29/71 GET 86:08 CDT 22:42 230/1

CAPCOM And, 15, we're ready now for the ion source switch on.

SC Ion source going on.

SC Houston, 15. We are going to configure communications for sleep.

CAPCOM 15, Houston. Could you hold off on that until just after LOS.

SC Okay.

CAPCOM Okay, 15, our last worry seems to be cleared up down here, we've got nothing more to bother you with and all we can do is wish you a good night's sleep.

SC Thank you, Karl, good night.

CAPCOM Good night.

PAO This is Apollo Control at 86 hours 13 minutes. We have lost the signal now on revolution 4. We've said "good night" to the crew, don't expect to talk to them until morning. The waste carrier has been turned off, we'll take this line down now at 86 hours 14 minutes. We're estimating the change of shift news conference for 11:15 P.M. Central Daylight Time in the News Center Briefing Room. Flight Director Gene Kranz is preparing to relieve Bill Windler and his his Flight Controller team. At 86 hours 14 minutes, this is Mission Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/30/71, GET 88:19, 231/1

PAO This is Apollo Control; 88 hours 19 minutes ground elapsed time. Apollo 15 just went out of sight behind the moon again. Nearing the end of the fifth lunar revolution. During the frontside crossing, there were no communications from the crew of Apollo 15, apparently they're settling in for the scheduled rest period. Telemetry showed the cabin pressure holding at 5.5 pounds per square inch. The lunar module pilot was hooked up to the biomedical telemetry, his heart rate was showing around 56 beats per minute. Apollo 15 is in a 9 by 58 nautical mile elliptical lunar orbit. Thirty five minutes until the spacecraft comes around the frontside again. Flight Director Gene Krantz and the White Team is getting his 10 hour shift organized for the morning hours. Quite a few cups of coffee around the room. At 88 hours 21 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 90:48 CST 3:23 MC 232/1

PAO This is Apollo Control. 90 hours 48 minutes into the mission of Apollo 15; now nearing midpoint of the seventh Lunar Orbit. Some 22 seconds until acquisition of signal in this front side pass on revolution number 7. During the sixth revolution there were no communications with the crew of Apollo 15. All systems look good on the ground on telemetry. A flight surgeon commented that the Lunar Module Pilot; we have just had AOS or Acquisition of Signal according to network; at any rate, the flight surgeon commented that the Lunar Module Pilot, the only one of the 3 instrumented with the Biomedical Telemetry Sensors, appeared to be soundly asleep. Apollo 15 is now in an 8 by 57 nautical mile Lunar Orbit. Velocity 5 454 feet per second. The present altitude is 27.3 nautical miles. Likely there will be an EM communications with the spacecraft at 90 hours 50 minutes ground elapse time. This is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/30/71, 6:04 CDT, 93:30 GET, 233/1

PAO This is Apollo Control at 93 hours 30 minutes ground elapsed time. Apollo 15 now crossing the front side of the moon on the eighth revolution. Some 18 minutes left during this front side pass. Spacecraft communicator Robert Parker will be calling the crew in the next minute or so to wake them up to begin the day's business. Primarily, landing on the moon. Flight director Gene Kranz is gathering the other, from the flight controllers, the various items that he wants brought up and passed to the crew for them to think about during the far side pass. He's now telling Capcom to give the crew a call. We'll come up live with air/ground and join this first call.

CAPCOM Apollo 15, Houston.

SC Houston, 15.

CAPCOM Good morning, Jim. We're waking up you a little early to tell you a few things before you go around the corner because you only have four minutes in the old flight plan. So if you guys are awake and ready to listen, I'll give you a few words.

SC Okay, Bob. Go ahead.

CAPCOM Okay. At the moment - okay. One short one we'd like you to go high gain antenna to auto so we don't lose you just before you go around the corner there. Okay. And at the moment, 15, you're sitting in a 58.8 by 7.6 orbit and at PDI we're extrapolating you to approximately 33 000 feet. This is with a plus or minus 9000 feet on top of it due primarily to the uncertainty of the RLS. Because of this we're pretty well decided we're going to do DOI trim but we're holding a decision on that until after we get the data for this pass which we'll process of course while you're behind the moon. We're talking about something like a 6 foot per second burn and probably targeting for 50 000 feet at PDI. As far as the rest of the spacecraft all your systems look good. No problems at all during the night. We do have a pan camera problem which may or may not be serious. We're going to look at it later on today after circ and then we'll be coming up with a procedure for Al for that later on in the day. A short item. We'd like a, during your eat periods if you have the time, also would like you to give us a gain step on the gamma ray up of 1. And we'd like to get a medication report too this morning. We apparently missed that last night. Over.

SC Okay. Copied all that. And no medication.

CAPCOM Copy. And we a consumable update for you as of 93:30. RCS total was 75, quad Alpha 76, Bravo 75, Charlie 74, Delta 77, hydrogen 2 tank 1 84, 2 81, and 3 54. Oxygen 2 tank 1, 82; tank 2, 86; tank 3, 68. Over.

SC Okay.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 610 CST 93:35 GET 234/1

CAPCOM 8. Over.
SC Okay. Got the consumable updates.
CAPCOM Roger.
CAPCOM CSM this is surgeon -

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 CDT 6:15 GET 93:40 235/1

CAPCOM Apollo 15, Houston. You're looking good
going around the Horn Systems all look good. At your
convenience while you're down the SIM BAY area, there, we'd
like also the mass Spec Discriminator to high. Over.
SC Okay, understand. Mass spec iscriminator to
high.
CAPCOM Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/30/71, GET 93:45, 236/1

PAO This is Apollo Control. Just had loss of signal with Apollo 15 as it passed behind the moon at the near the end of the eighth revolution. During the wake up call after the crew responded, spacecraft communicator passed up 2 or 3 items, crew should be thinking about, such as doing the so-called DOI trim maneuver, which is an optional item shown in the flight plan, at 96 hours 17 minutes. It's rather like a midcourse correction maneuver transearth or translunar coast. If required it would be done. And apparently the pericynthian has drifted somewhat lower during the night than was anticipated. That coupled with the uncertainty in the radius of the landing site, that is the height of the landing site from the center of the moon. There's much thought being given to doing the DOI trim maneuver to raise the pericynthian or start of the point at which the power descent initiate or landing phase would begin raising that point from what would be estimated to be 33 thousand back up to about 50 thousand feet. Present orbit measures 7.6 nautical miles pericynthion by 59 nautical miles apocynthion. The magnitude in the maneuver being considered is somewhere in the ball park of 6 feet per second. Beond done on the far side of the moon to raise pericynthian. More discussion will follow during the next front side pass on the ninth revolution, which begins with AOS in 45 minutes. At 93 hours 51 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/30/71, 7:10 CDT, 94:34 GET, 237/1

PAO This is Apollo Control, 94 hours 34 minutes ground elapsed time. Slightly over a minute before predicted acquisition of Apollo 15 as it makes the ninth lunar revolution front side pass. During this pass we will have command module television camera view of the landing site as the spacecraft swoops down to something like 7 miles above the surface. We're awaiting word from the network controller that we've had acquisition of signal. The crew should be finishing up their breakfast meal period. We've had acquisition of signal. Let's join the air/ground for the initial communications on this ninth revolution.

CAPCOM Apollo 15, Houston.

CAPCOM Apollo 15, Houston. Over.

CAPCOM Apollo 15, Houston. Over.

SC Houston, Apoll 15. You're 5 by.

CAPCOM Roger. You're 5 by also. And we got three more flight plan updates to you if you're ready.

SC Okay. Go ahead.

CAPCOM Okay. First one I'd like to mention is 95:02. And it reads in addition to those two lines on the O2 heaters at the top of the page, we want to add a third line that says CB O2 tank 100 watt heaters 3 main B open. Panel 226. Over.

SC Okay. Understand. CB O2 tank 100 watts heaters 3 main B open.

CAPCOM Roger. And after you guys give us the PDI readouts we'd like to exchange the CMT and CDR PDR's because Dave yours appears to be malfunctioning and they'd like to have two working ones on the surface. Do you copy?

SC Okay. Understand. Exchange CMP and CDR PRD.

CAPCOM Okay. And the next updates for the LM activation checklist and while you're getting that I'll give you a little update on our expectations for the DOI burn.

SC Okay. Stand by.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/30/71, GET 94:40, 238/1

SC Okay, Stand by.

SC Okay. Go ahead, Bob.

CAPCOM Okay, the updates for the activation checklist is on page 2-6.

SC Okay. Two-six. Go.

CAPCOM Okay, we'll delete the third line of step 2 and we'll add a step 5 which reads: (1) LMP's suit iso valve to suit flow; commander's suit iso valve to suit flow to 15 seconds and then suit disconnect for both, and then (2) is suit gas diverter, push cabin. What we're doing here, Dave, is basically making sure that we're blowing any glass particles that might have settled in through the little holes into the inlet hoses. Going to blow those out. Over.

SC Okay. Understand. Steps 2, scratch the third line, step 5, LMP and CDR suit isolation to suit flow for 15 seconds, then suit disconnect for both and then suit gas diverter, push cabin. And, that sounds like a pretty good idea.

CAPCOM Okay. And, I'll give you a few clues as to what's liable to be coming up for the DOI trim burn. Currently, we're showing a 5.87 perilune on REV 14, which is 35,000 feet plus or minus 9000 with that RLS uncertainty. And, what is being proposed now is not an SPS burn, because it will be very short. But an RCS burn of 20 seconds, which is 3.2 foot per second, which would raise us to 50,000 feet. It will cost us about 27 pounds of gas and we're looking at a tick time of 95:56, which you will note, it is 20 minutes early - earlier than the flight plan, which means we are going to have compress some of that stuff together. Over.

SC Okay, understand. 95:56. Looking over the flight plan, it looks like had we gone in on the original DOI trim we had about 40 minutes of CM data there and maybe we can just scratch that.

CAPCOM Roger, Dave. We are just going to have to turn that CM stuff off a little bit early because we don't have the time right here.

SC Okay. I guess what I'm thinking is, it takes us a lot of time to go through that. Turn on and turn off. And, of course, we could always use time, but we'll get it.

END OF TAPE

CAPCOM Dave, we don't show you turned anything on this morning it's just a long protracted business of turning it off, and I guess that, use to be starting after the TV pass, and I guess what we're saying right now is it looks like we're going to start turning that off during or before the TV pass.

SC Okay, you're right Bob. We'll do that, it looks good.

CAPCOM Okay, and we'll be getting you a real pad coming up some time soon.

SC Okay, we'll be standing by.

CAPCOM And Dave, if practicable, we'd prefer to have it turned off before or after the TV, because then we can watch it being turned off otherwise we can't see it during the TV. But you can certainly turn part of it off before and part after.

SC Okay, understand. We'll do it sometime other than the during the TV.

CCPAQM Rog.

CAPCOM Okay, Dave, and we got a few updates here for the time after the TV pass if you're ready to copy. Some other stuff that we are moving up because of this.

SC Okay, ready to copy. Go ahead.

CAPCOM Okay, at 95 28 we will schedule a P52 option 3.

SC Okay, P52 option 3.

CAPCOM Okay at -

SC 95 28.

CAPCOM Roger. At 95 33, we will delete the P00 at PITCH 033.

SC Okay, delete P00 at PITCH 033 at 95 33.

CAPCOM Roger. AT 95 35 we will delete P52 option 3, and that's the one we've moved up 7 minutes.

SC Roger, go ahead.

CAPCOM Roger, and at 95 43, we will delete the P52 option 1, because we will be staying on landing site REFSMMAT.

SC Okay, very good. Go ahead.

CAPCOM And at 95 30 we're going to start, we're going to move the activities that start around 95 47 to 95 55. So it will be moved up to 95 30.

SC Okay. Do you want, okay, I got it. Fine.

CAPCOM That's that little box there, and the time to show on the flight plan anyway is 95 56 for the DOI trim.

SC Rog, 95 56.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/30/71, 7:25cdt, 94:50get, 240/1

SC Houston, 15. Is that all you have?
CAPCOM Roger, sorry Dave. That's the end for now.
SC Okay.
SC Houston, 15.
CAPCOM Go.
SC Okay, Bob, we've got the TV turned on if you
want to catch it down there.
CAPCOM Rog. We'll do our best.
SC Okay, Houston, 15. We're coming up on the
edge of Crisium and we've got a good picture up here.
CAPCOM Roger, no filming down here yet, but we're
anticipating.
CAPCOM 15 could we verify that you're in TRANSMIT
on the TV switch, please?
SC Okay, that was the problem. We've got it.
I got it.
CAPCOM Thank you.
PAO The television picture from the spacecraft
now coming in on the large - -

END OF TAPE

PAO Television picture from the spacecraft now coming in on the large Eiderphor projector in front of the Control Room. Meanwhile, in the viewing room, among the people watching the television pass this morning are Mrs. Jim Irwin, Mrs. Dave Scott, Mrs. Scott's mother Mrs. Isaac OTT, Apollo 11 Commander Neil Armstrong and Doctor Werner von Bruan.

SC Okay, Houston, 15. If you want to orient yourself on a TV there, Bob. We just came over Macrobius A and the small crater that you just saw -- we just went by Romer J, we're coming up on Romer K here in a moment, which means that very shortly, we'll be coming up over the Littrow Rille - Rima Littrow.

CAPCOM Roger, is that our little (garble) out here.

SC Okay.

SC Yeah, it looks like Romer J, we're just coming up on now. In fact, we'll pan down into it.

CAPCOM Beautiful job.

SC Okay, Bob. You can see we're up over one of the Littrow Rilles now. You can see the rille cutting diagonally there from about 6 o'clock to 2 o'clock across the picture and you can see some of the wrinkled ridges -- in fact, there's a beautiful wrinkled ridge right below us right now.

CAPCOM Roger. I believe you, I see it.

SC I'll pan up along the wrinkled ridges so you can see. And they are a very very distinctive thing. Now we're out over Mare Serenitatis. As you can see, some of the Lattrow Rilles in the back ground there are some of the graben type rilles and some of the wrinkled ridges down on the far -- or on the close corner here.

SC Now, we should be coming up out of the inner ridge system here in a moment and we'll try to pan down along the -- the inner ridge.

SC Yeah, it looks like the inner ridge system there, and if your pictures are like mine, you should be picking up pretty well.

SC Those ridges at places look like they could be nothing more than -- than a flow that stopped there - flow front. In other places, they look like the -- like the -- like its buckled material underneath folded to give us an elevation.

CAPCOM Roger.

CAPCOM Roger.

CAPCOM And that was a good one, Al. And if someone who is not just looking out the window will give us POO and ACCEPT, we'll send you up a - not POO, just ACCEPT - pardon me, we'll give you state vectors and targets. While we're thinking of you.

SC You got it.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 95:01 CDT 7:36 242/1

SC the state vector is in target so we'll be thinking of you.

SC You got it.

SC Okay.

PAO Apollo 15's present altitude now 7-1/2 nautical miles above the lunar surface.

SC You can see the beginnings of the Apennine Front showing up on the farside of Serenitatis.

CAPCOM Roger, we see that.

SC And off on the left there that's the veins found around south of the Apennines.

SC See how - when you're coming up at low altitude on these mountains, how striking they are in the distance. It's really hard to miss any, but they're a long ways away.

CAPCOM I hope you can miss it.

SC I guess that's up to you guys.

CAPCOM Roger. Speaking of that, the burn attitude is going to be 104 degrees so you might keep that in mind when you get down there. You're getting kind of close to it now. Beginning to get close to it.

SC Okay.

SC There's a very interesting little fissure just below us here, Bob. It looks like there might be a little flow coming out of it, but it's almost an arrowhead shaped affair. And it certainly doesn't have any features like any impact. It's very sharp and distinct and makes a very distinct arrowhead. Here we come up on the ridges on the west side of Serenitatis, just at the foothills of the Apennines. And you can see there is some relief, as we look back to the south there, there is some very distinct relief in the shore of the Serenitatis with some wrinkle ridges that follow the contour, and what look like some fairly distinct (garble) rilles that also follow the contour. I think that when we get up very close here, you can see in the field of view there right now is a lunement that looks like it might be some sort of a collapsed lava tube and you can also see down in here, the mare material looks like it is pooling in the foothills of the mountains and in some places you can even see what appears to be a frozen shoreline, so to speak.

CAPCOM Beautiful, beautiful.

CAPCOM Roger, you can take black now, too.

SC Okay.

SC Okay, Bob. I'm going to take the TV out of this window and get it located in window 3 so we can all have a good look at the landing site.

CAPCOM Okay.

SC Sorry about that, we're just a little bit late, but you can see the edge of the rille there as we go

APOLLO L5 MISSION COMMENTARY 7/30/71 GET 95:01 CDT 7:36 242/2

SC beyond it. And you can see the blocky features
inside the rille. And now we're out across the plain on
the other side. That was very fast.
CAPCOM That was a quickie.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/30/71 GET9506 CDT741 243/1

SC Okay, in our field of view right now, Bob, is the beginning of Bradley Rille and you can see it cutting back off to the southwest there.

CAPCOM Roger, looks kind of like our rille.

SC Yeah, it does, doesn't it?

CAPCOM Okay, and right up.

PAO This is Apollo Control at the conclusion of the television pass the crew held up a sheet of paper on which appeared to be written the word "finis".

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/30/71, 7:47cdt, 95:11get, 244/1

CAPCOM And, Apollo 15, Houston. We've got a DOI trim pad for Jim when he's ready to copy.

SC Good morning, Bob. I'm ready to copy.

CAPCOM Roger, Jim. The P30 pads, purpose: DOI trim. RCS G&N 38 264 noun 48 is NA, 09556 4250 plus 00031, the last two noun 88's are zero. 180 104 359 noun 44 is 00594 plus 00096 00031 020 00031 30 1928 111 the rest of the pad is NA. GDC aline stars are Vega and Deneb, roll, pitch and yaw are 288 340 346, it's a 4-jet RCS burn and we do not want to trim any retrograde residuals, so any extra burn you get in that direction, we will not trim. Over.

SC Okay Bob, the DOI trim pad readback: RCS G&N 38264 09556 4250 plus 00031, 0 and 0 for Y and Z 180 104 359 00594 plus 00096 00031 020 00031 30 1928 111 Vega and Deneb 288 340 346, 4-jet RCS, no trim of any retrograde residual.

CAPCOM Roger. Copy. Correct and one last comment; we will not be passing you up a TEI 19 pad at this time.

SC Understand.

CAPCOM And that should take care of all little squares in that MSFN update box at - - at 95:25.

SC Repeat the last one, Bob.

CAPCOM Rog. I was just telling you that takes care of all squares there at the MSFN update at 95:25. We've taken care of all those in one way or another this morning.

SC Roger.

SC Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 GET9516 CDT0752 245/1

PAO This is Apollo Control. At 8 o'clock Houston time astronaut Harrison Jack Schmitt will make a briefing in the Houston News Center on the Apollo 15 EVA periods. The 3 EVA periods. Still up live here on the 9th front side revolution of the moon by Apollo 15. Another 21 minutes till loss of signal. Crew presently is maneuvering to the burn attitude for the DOI trim maneuver, which will be an RCS burn. The burn time of 20 seconds. Looking for 3.1 feet per second, change in velocity to raise the pericyynthion. Ignition time is 95 hours 56 minutes 42 seconds ground elapsed time. Up and live, this is Apollo Control.

END OT TAPE

APOLLO 15 MISSION COMMENTARY, 7/30/71 GET9522 CDT7:58 246/1

CAPCOM 15, people down here are recommending that
you terminate your roll at this attitude to help your P52 before
you press on to the burn attitude.

SC Hey, very good, Bob, thank you. We will.

SC Houston, this is 15 with some retraction time
for you.

CAPCOM Okay, go ahead.

SC On the mass spec it was - on the mass spec it was 233.
On gamma ray 309.

CAPCOM Copy, thank you.

SC Well it's 2 minutes and 33 seconds 3 minutes
and 9 seconds.

CAPCOM Say again 15. Was that 233 seconds and 3 minutes
and 9 seconds.

SC No, two minutes and 33 seconds, 3 minutes and
9 seconds.

CAPCOM Roger. We have that thank you.

END OF TAPE
|

SC Houston, 15.
CAPCOM Go ahead.
SC Okay, Bob. I'm setting looking right at the surface of the optics at this attitude. Give me a good roll angle to go to.
CAPCOM Okay, stand by.
CAPCOM Stand by. We're talking about it guys.
SC Okay Bob.
CAPCOM Roger 15, now that we told you to stop, why don't you press on to the burn roll on 180.
SC Okay, thanks alot.
CAPCOM For what. And now if you'll lose high gain by going to the burn attitude before you are on the corner, it will be OMNI Delta in the burn attitude.
SC Roger, OMNI Delta.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/30/71, 8:09cdt, 95:32get, 248/1

CAPCOM And, Apollo 15, we'd like track AUTO as you go around the corner here. It'll help us keep you on data for a couple of minutes there at the end. And we've got a couple of stars for you, if you want to take any more advice. And that's at 25 and 26.

SC Okay. 25 and 26 and you've got AUTO.

CAPCOM Thank you.

CAPCOM And Apollo 15, you're 5 minutes from LOS, still looking good and GO for the burn for DOI trim.

SC Okay. Understand. GO for the burn for DOI trim. See you on the other side.

CAPCOM Rog.

end of tape

APOLLO 15 MISSION COMMENTARY 7/20/71 GET9537 CDT0815 249/1

PAO This is Apollo Control. We've now had loss of signal as Apollo 15 sails behind the moon nearing the end of the 9th revolution. Coming up in about 13 minutes on the DOI trim maneuver, which will be an RCS burn to raise pericyynthion from the present 7 and a half nautical miles to 9.6. 3.1 feet per second, burn time of 20 seconds. 1 hour and 8 minutes until, I'm sorry about that, about 47 minutes actually to acquisition of signal again. At 95 hours 44 minutes ground elapsed time, this is Apollo Control out.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 GET9625 CDT0900 250/1

PAO This is Apollo Control. We're now about 4 minutes from reacquiring the spacecrafts, Endeavour and Falcon, on their 10th revolution of the moon. Here in mission control we've completed a shift handover. The on duty flight director at this time is Glynn Lunney. Our spacecraft communicator is astronaut Ed Mitchell. The off going flight director Gene Kranz and we do anticipate having a change of shift briefing in the MSC News Center Briefing room. Probably in 15 or 20 minutes. On reacquiring the spacecraft, the first order of business will be to get a report on the descent orbit insertion trim maneuver performed about 30 minutes ago behind the moon. This maneuver is calculated to raise the pericynthion or low point of the spacecraft orbit from about 7 and a half nautical miles up to about 9.6, which is the preferred altitude to begin the power descent from on the 14th revolution. During the tracking of the spacecraft it was evident that the orbit was gradually decaying. They were getting down to the point where at power descent initiation the altitude would have been around 30 thousand feet. This would have been acceptable but the preferred altitude is about 50 thousand feet so the maneuver was performed using the reaction control system attitude thrusters. We're standing by now about 2 minutes from reacquiring the spacecraft, and we will continue to stand by until we hear a call to the crew.

PAO We are less now than 30 seconds from reacquiring Apollo 15. Flight director Glynn Lunney has completed a review of the status of the mission with all of his flight controllers, and all of the buttons on his console from each flight controller indicate green. And we're standing by now to reacquire in about 5 seconds.

PAO And we've had acquisition of signal.

CAPCOM Apollo 15, Houston. Standing by.

SC Rog, Houston. 15 here. We had a good burn and have a burn report for you.

CAPCOM Roger, ready to copy.

SC Okay, on time burn time was about 18 or 19 seconds the residuals were minus .1 plus .2 plus .2 Delta VC was plus .8 and the G&N has us in a 59.4 by 10.3.

CAPCOM I copy Dave.

PAO You heard Dave Scott report the results of that burn almost precisely as planned.

CAPCOM The landing set observation pad for you when ready.

SC Roger go ahead.

CAPCOM T horizon 96 57 10. Stand by.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/30/71 GET9631 CDT905 251/1

CAPCOM 15, you still with us?
SC Rog, we're there and T horizon 96 5710 standing
by for TCA minus 20.
CAPCOM Roger. It's at 96 59 17.
SC 96 59 17.
CAPCOM That's good.
CAPCOM 15, Houston we have an uplink for you, state
vector and a REFSMMATT, give us POO and ACCEPT.
SC POO and ACCEPT.
CAPCOM And 15, Houston. I have a couple of words for
Al on the system test meter if he can listen.
SC Sorry, he is busy right now. What do you need?
I'll tell him later.
CAPCOM Ed, we'll get it to him later. It's simply
that the systems test meter is okay to use for the LM checkout
on the LM current.
SC Okay, thank you.
SC Houston, 15 we are equalizing the pressure now
and the Delta P was 1.0 before we started.
CAPCOM Copy.
CAPCOM 15 the computer is yours.
SC Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 96:36 CDT 9:10 252/1

PAO The Flight Dynamics Officer reports that descent orbit insertion trim maneuver was just about precisely as planned. That will change the pericyynthion from about 7 and a half nautical miles to about 9.6. Scott reported on board that their guidance and navigation system calculated their orbit after the burn to be 59.4 by 10.3 which would agree very closely with the ground calculation. A few minutes ago, Dave Scott reported that they were equalizing the pressure in the tunnel between the LM and the CSM. This would put them about 30 minutes ahead of the flight plan on this activity which means that operations prior to entering the LM are progressing smoothly and about 30 minutes ahead of schedule.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/30/71, GET9641 CDT915 253/1

PAO This is Apollo Control at 96 hours 43 minutes and we're going to transfer at this time to the MSC news center briefing room for a change of shift press briefing. We will follow our usual procedure of recording any conversations with the spacecraft that occur during the briefing, and play those back immediately following.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/30/71 GET9706 CDT940 254/1

PAO This is Apollo Control at 97 hours 7 minutes, during the change of shift briefing we accumulated about 3 to four minutes of tape. We'll be playing that back for you in a moment. The one, I think, most significant thing that was included on that tape was a report from Dave Scott that in passing over the area of the landing site they had no trouble marking on Index Crater which will be used from the Command Module by Al Worden to track the landing site prior to power descent and will be a reference point for determining the orbit, and we'll play back the accumulated tape for you and then continue to standby live.

SC 15, Houston.

CAPCOM Houston, 15, go ahead.

CAPCOM Al, we didn't get your last torquing angles and torquing time. Could you read them down to us, please?

SC Okay, Ed, just a minute.

CAPCOM If you are busy we'll get them later.

SC I'll give them to you now, anything for you. Okay we used stars 25 and 26. Noun 05 was four balls one, torquing angles were plus 00022 minus 00032 plus 00038 and they were torqued out at 95 43 00.

CAPCOM Roger copy and as long as we have you on the loop, your REFSMMAT, 00 time is 104 41 43 00.

SC I'm sorry Ed, I didn't get that. Would you say that again, please?

CAPCOM Roger, 104 41 43 00.

SC Understand. REFSMMAT time is good for 104 41 43 00.

CAPCOM Good readback.

CAPCOM 15, Houston. 1 minute to (garble)

SC Rog, Ed.

SC Houston, Apollo 15.

CAPCOM Go ahead, 15.

SC Okay, looks like FAO owes us (garble I had no trouble picking up Index crater at all. The surface looks generally smooth. I saw no big boulders. I saw more craters than we are normally used to seeing but I think that's because of the resolution of the photography. I can see a fair amount of boulders in the bottom of the rille. Most of the surface seems to be pretty subdued and rounded. I did see some debris around some of the fresher craters and, of course, I don't know exactly what size but if we were looking at 3 feet resolution on this I'd say I didn't see anything larger than oh, I guess at the most maybe 15 feet or so but that's - that was a unique (garble). The area in general looks pretty good. I don't think we'll have any problem picking it up and I don't think Al will have any problem at all identifying Index Crater.

CAPCOM Okay, Dave. We copy. Thanks a lot.

SC Rog.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 GET9711 CDT0945 255/1

PAO This is Apollo Control that completes our play back of the accumulated tape and we'll continue to stand by live now. Dave Scott in that play back reported the surface of the landing site appeared to be subdued and rounded but nothing larger than about 15 feet or so. And also added that it should be no problem for Al Worden to track on the site from the command module.

SC Okay, Houston go ahead with the TEI pan.

CAPCOM Roger 15. TEI 19 SPS G&N 38 009 plus 061 plus 105 115 27 5559 plus 284 51 minus 08317 minus 02197 180 102 346. The rest in A, ullage 4 jett 12 seconds, and some notes. One is burn, is undocked, two, assume circ 3. Oh longitude at TIG is 166.0 west, and the fourth note is the attitude based on landing site REFSMMAT.

SC Okay, read back. TEI 19 SPS G&N 38 009 plus 061 plus 105 115 27 5559 plus 284 51 minus 08317 minus 02197 180 102 346. 4 jett 12 seconds, burn undocked, assume circ longitude 166.0 west at TIG and landing site REFSMMAT.

CAPCOM That's affirm, and we have a few (garble) seconds update for you C&C clock. Whenever your ready.

SC Okay, you want POO and ACCEPT?

CAPCOM That's affirm.

SC You've got it.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 97:16 CDT 9:50 256/1

CAPCOM The computer is yours, 15.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 GET9721 CDT0956 257/1

CAPCOM Falcon, rather Apollo 15, Houston. OMNI Charlie please.

SC Houston, 15. Go ahead.

CAPCOM OMNI Charlie, please Al.

SC Okay, OMNI Charlie.

CAPCOM I haven't had a chance to say good morning Al, so good morning.

SC Good morning Edgar.

PAO That was the command module pilot Al Worden exchanging good morning greetings with spacecraft communicator Edgar Mitchell.

END OF TAPE

CAPCOM Apollo 15, Houston.
SC Houston, 15. Go ahead.
CAPCOM Roger. We need to redo the REFSMMAT update that we gave you a while ago. Could we have POO and ACCEPT please?
SC Okay, Ed. You caught me just in time to redo P52.
CAPCOM Roger.
SC I'll go back and do it.
CAPCOM What we were hoping you'd do.
SC Okay, you got it now.
CAPCOM Roger. Here it comes.
CAPCOM The story here, Al, is apparently the block update changed some registers in the REFSMMAT and screwed it up a bit.
SC Roger.
CAPCOM 15, Houston. The computers yours, and Al, before you do 52, be advised, you can use the system test meter on the backside for any of the normal LM checkout functions. On the frontside, we'll watch it for you. And go ahead and leave this test meter in whatever position you're testing with. Understand?
SC Roger, Ed. Understand.
CAPCOM Okay, see you after P52.
SC Okay, thank you.
CAPCOM Apollo 15, Houston. 30 seconds to LOS.
SC Roger, Ed.
PAO And we've had loss of signal now, while on the backside of the moon, on this tenth revolution, and going into the eleventh revolution. Scott and Irwin will be getting suited up by the time we reacquire on the frontside of the moon. They should be in the Lunar Module and beginning to power up and check out the LM prior to undocking and separation at 100 hours 14 minutes. As the spacecraft went around the corner, Al Worden was in the process of doing a program 52, which is a platform alinement. This is normally performed prior to and following maneuvers with the spacecraft, alining the stable platform used as an attitude reference by the guidance system. We'll be reacquiring the spacecraft in approximately 45 minutes. During this period, while we're out of contact, we plan to replay the video tape with this morning's television transmission from Apollo 15. That tape is about 15 minutes in duration. At 97 hours 37 minutes this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 98:22 CDT 10:56 259/1

PAO This is Apollo Control at 98 hours 22 minutes and we're now about 2 minutes from reacquiring Apollo 15 on its eleventh revolution of the Moon. Flight Director Glynn Lunny just asked all of his flight controllers to be on their toes for this revolution. The front side pass, he said, would be a very -- a very busy one. The crew will be primarily involved with the activation check list onboard the Lunar Module - Scott and Irwin. Coming up on the succeeding two revolutions, 12 and 13, we'll have some important landmark trackings being performed by Al Worden in the Command Module updating the knowledge of the landing site and of the spacecraft state vector orbital parameters. And we're now about 1 minute from reacquiring Apollo 15.

PAO And we've had acquisition of signal.

SC (garble).

CAPCOM Okay, Al. We'll (garble). 321 mark. (garble).

CAPCOM Apollo 15, Houston, standing by.

SC Roger, Houston. This is Falcon. (garble).

CAPCOM Okay, FAlcon. Reading you. We have a lot of noise on the loop if you'll just wait one moment.

SC (garble).

END OF TAPE

FALCON Okay, Endeavour, set her down just about (garble)

ENDEAVOUR On your mark 3, 2, 1. mark.

FALCON Okay, 98 46 59.20.

ENDEAVOUR Okay, we'll (garble)

FALCON Okay.

CAPCOM Endeavour, Houston. Do you read.

ENDEAVOUR Hello Endeavour Houston (garble)

CAPCOM Okay, Al. We read you through the static. Let us have narrow on the high gain please.

ENDEAVOUR Okay, you've got it. Narrow (garble).

FALCON Houston, this is Falcon. We're going to configure for the secondary S-band transmitter and receiver.

CAPCOM Okay. Falcon press on with secondary S-band.

FALCON Houston, this is Falcon. I (garble)

CAPCOM Endeavour, Houston. Verify on your last P52 (garble)

ENDEAVOUR Houston, Endeavour. Go ahead.

CAPCOM Roger, Al. Verify that on your last P52, you used option 1.

ENDEAVOUR I think that's negative. I used option 3. Stand by one and I'll check.

CAPCOM Roger. We're standing by.

ENDEAVOUR How do you read Falcon.

CAPCOM Falcon, Houston. You're coming through, We have a lot of static on the line. They're trying to clear it up now. You're way down in the garble.

FALCON Okay. I certainly (garble) on it.

97 54 55.

ENDEAVOUR Houston, Endeavour.

CAPCOM Go ahead Endeavour.

ENDEAVOUR Okay, Ed. I did do that on an option 3.

CAPCOM Okay, we'll have some words for you and we're ready to uplink to you Endeavour if you'll give us P00 and ACCEPT.

ENDEAVOUR Okay, you've got P00 and ACCEPT.

CAPCOM Falcon, Houston. Your S-band check is okay. You can press on and I'll have your updates for you in a little while.

FALCON Roger.

CAPCOM Apollo 15, Houston. I'm going to hold off reading you any pads at the moment until we can clear up our comm on the ground.

SC Roger.

CAPCOM Falcon, Houston. Bring up your steerable please. See if that helps our comm.

FALCON It works.

PAO We think the noise coming on the communication circuit at the present time is due primarily to the fact that the lunar module is still using the OMNI antennas for communication. We've asked Scott and Irwin to bring up the

APOLLO 15 MISSION COMMENTARY 7/30/1 GET9827 CDT1101 260/2

PAO LM sterrable antenna and once they get that in operations we expect that the noise on the circuit will drop off significantly.

FALCON Houston, this is Falcon. We're locked up on the high gain. How do you read.

CAPCOM Okay Jim. Reading you loud and clear now. That has seemed to improved our comm and I'm ready to start with the pads. Start with the CSM first A1, whenever you are ready.

SC Okay, he's working right now. Are you ready for the E memory dump for the Falcon.

CAPCOM Stand by.

END OF TAPE

CAPCOM Falcon, Houston. We're ready to E-MY dump.
FALCON Okay, stand by.
CAPCOM Endeavour, Houston. The computer's yours.
ENDEAVOUR Rog, Houston.
PAO The Erasable Memory Dump, which is in process at the moment, allows the Flight Controllers here in Mission Control, to look at the Erasable Memory Module in the Lunar Module Guidance Computer and see that everything is in order.
CAPCOM Falcon, Houston. Give us P00 and Data. I have an uplink for you.
FALCON Roger, P00 and Data.
CAPCOM And I'm ready to give PADS, Falcon, whenever you want them.
FALCON Go ahead, Ed.
CAPCOM Roger. LM Data first. CSM weight 37679 LM weight 36630. Your GDA drive angles onboard are good.
FALCON Okay, copy. CSM weight is 37679, LM weight 36630.
CAPCOM That's affirm. AGS abort constants 224 -
FALCON Go ahead.
CAPCOM Plus 60442 225 plus 29365226 plus 60449 305 minus 01659 662 minus 55021 673 minus 32306.
FALCON Okay, read back on the AGS abort constants. 60442 29365 60449 01659 55021 and 32306.
CAPCOM Affirm. The first 3 are plus, the last three are in negative.
FALCON That's affirm.
FALCON Houston, Falcon.
CAPCOM Go ahead, Falcon.
FALCON Okay. Everything is in order up to this point as far as the checkout goes with the exception of the LGC, which we pushed in the LGC circuit breaker, we got a program light with a 400 and R1 and Verb 5 Noun 9 gave us an 1105, which seems to be of little consequence just thought you might like to know.
CAPCOM We copy, Dave.
CAPCOM Falcon, Houston. The computer's yours.
FALCON Roger.
CAPCOM And Endeavour, Houston. Are you about ready for your PADS?
ENDEAVOUR Rog, Ed. Stand by 1.
ENDEAVOUR Okay, Houston. Endeavour's ready to copy.
CAPCOM Okay, Falcon. The first one's a SEP time if you would like that one too.
FALCON Houston, Falcon. Go ahead. We'll stand by.
CAPCOM Okay. SEP GET 100 135600 with PITCH angle of 108.

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 98:32 CDT 11:08 261/2

ENDEAVOUR Understand, Ed. That's GET of 100 1356.00 and
that's a PITCH angle of 108.

CAPCOM That's affirm, Al. The next one is CSM DAP
data.

ENDEAVOUR Okay, go.

CAPCOM Roger. CSM weight 37679, PITCH 0.49, YAW 1.04.

ENDEAVOUR Understand. The DAP data is weight 37679

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 98:43 CDT 11:18 262/1

SC I understand that the DAP data is weight 37679. Pitch trim is 049 and yaw trim is 104 and do you have the signs on those?

CAPCOM It's a good readback and say again your last?

SC Roger, Ed. I need a sign on the pitch and yaw trim.

CAPCOM All right, Jim. Let me check that.

SC Okay.

CAPCOM For now, they are both positive.

SC I understand they are both plus.

CAPCOM Okay, your T24 is next.

SC Okay, go ahead.

CAPCOM T1, 100 4629, T2, 4707, TCA, 4737, T3, 4759, roll, pitch, and yaw is 008 296 000 north 3 nautical miles. NOUN 89 longitude over 2 plus 2.149. Latitude and altitude are nominal.

SC Roger, Ed. Understand T24 LM or tracking pad T1 at 100 4629, T2 4707, TCA, 4737, T3 4759. Roll of 008, pitch 296, yaw 000. Expected north at 3 nautical miles. And understand a longitude over 2 is plus 02149 and latitude and attitude are as in the flight plan.

CAPCOM Good readback, Al.

FALCON And Houston, this is Falcon. ED batteries in both reading 37 volts.

CAPCOM We copied that, Falcon, thank you.

SC Okay, Endeavour, Falcon, we're ready for a undock time new course a line if you are.

ENDEAVOUR Okay, Falcon. Stand by on e.

FALCON Okay, give us a call when you are in min dead band and attitude hold.

ENDEAVOUR Roger.

ENDEAVOUR Okay, Dave, we're there.

FALCON Okay, if you read us your gimbal angles, please.

ENDEAVOUR Okay, R1 is plus 00124, R2 is plus 10166, R3 is plus 00537.

FALCON Plus 00124, 10166, 00537.

ENDEAVOUR Roger.

CAPCOM Falcon.

FALCON Houston, Falcon. We got about 5 minutes till sunset here.

CAPCOM Okay, Dave. And we have a clock update for you for about 66 (garble) seconds if you'll give us POO and data, please.

FALCON Okay, POO and data. You got it.

FALCON And Houston, Falcon. We'd like to do the RCS pressurization now since we're a tad ahead if -- you're ready to take that?

CAPCOM Okay, we're ready Falcon, go ahead.

FALCON Okay.

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 98:43 CDT 11:18 262/2

CAPCOM And endeavour, Houston. When you get a moment, we'll take your readups from the last P52.

ENDEAVOUR Okay, Ed.

CAPCOM Falcon, the computer is yours.

FALCON Roger.

FALCON Houston, Falcon, a slight pause here while we look at the landing site. We're going right over it.

SC Okay, a few interesting differences there. Index was much more subtle than we've seen on the simulator and Earth light is much sharper with a much deeper shadow.

CAPCOM And copy, Dave.

SC Houston, Endeavour. Here are the T52 numbers.

CAPCOM Say again, Endeavour.

SC Roger, I got the T52 numbers for you.

CAPCOM Ready to copy, Al.

SC Okay, Ed. Stars 41 and 42. NOUN 05 was plus 4 balls 1. (garble).

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/30/71 GET9854 CDT1128 263/1

SC Noun 05 was plus four balls 1. Gyro torquing angles were minus 00010 minus 00009 minus 00025 and they were torqued out at 97 39 even.

CAPCOM Copied that Al and could you give us your LM power switchover time, please?

SC Roger, that was at 97 35.

CAPCOM We copy that and what was the result of the VHF checks. That work, okay?

SC That was satisfactory both ways, as far as I know.

CAPCOM Thank you.

SC Rog, Houston, it was good both ways. Hey, Endeavour, Falcon, did you copy that on the difference between Earth light and Index.

ENDEAVOUR Rog.

SC And Houston the RCS looks good up here on the Falcon.

CAPCOM It looks good down here, Dave.

SC Okay, we'll pick up the alinement now and get back to you later on with the RCS checkout.

CAPCOM Okay.

PAO At the present time Scott and Irwin are alining the stable platform used as an attitude reference by the lunar module guidance system. We presently show the docked spacecraft in an orbit 62 by 9.4 nautical miles and presently at an altitude of about 10.6 nautical miles.

SC Houston Falcon that P57 up here docked works pretty well.

CAPCOM Houston, Falcon, do you have the torquing angles?

FALCON That's affirmative.

CAPCOM Okay, we will torque them at 1130.

FALCON Roger.

CAPCOM Observe the 5 balls there.

FALCON There are a couple of interesting things we have reflection off the command module apparently from Earth light and it is sort of tough to track the star with the command module deadbanding but it seems like if you get the star in the crosshairs why the optics take care of it for you.

CAPCOM Copy, and Falcon, Houston would you verify the roll cal for us, please?

FALCON Roger. Minus .1.

CAPCOM Copy, Dave.

FALCON Okay, Endeavour, Falcon mid dead band no longer required.

ENDEAVOUR Okay.

FALCON Okay, Houston, Falcon we are ready for the RCS checkout if you are.

CAPCOM Ready to go Falcon.

APOLLO 15 MISSION COMMENTARY, 7/30/71 GET9854 CDT1128 263/2

FALCON Roger.
FALCON Okay Houston, Falcon do you have your high bit rate?
CAPCOM Rog, affirm, Dave.
FALCON And Endeavour, we need you in a wide deadband attitude hold.
ENDEAVOUR Okay, wide deadband attitude hold.
FALCON Roger.
FALCON Endeavour, Falcon, do you have any jett firings going on over there?
ENDEAVOUR I haven't conducted any, Dave.
FALCON Okay.
ENDEAVOUR You want me to go free now.
FALCON Rog, go free, please.
FALCON Okay, Endeavour we'll be firing a direct hold.
PAO Scott and Irwin are now preparing to fire each of their attitude control thrusters in the reaction control system in a to check out here.
FALCON Okay, Endeavour hot fire check is complete. Everything looks good. You can go back to wide deadband attitude hold..
ENDEAVOUR Okay, and I'm going to turn the roll DPS off and put the hatch in if you don't mind.
FALCON Oh, good.
CAPCOM LM, Falcon, Houston.
FALCON And Houston, Falcon how did it look down there.
CAPCOM Well, I was just going to tell you, Dave, hot fire check looked good here.
FALCON Okay, they are nice and positive aren't they.
CAPCOM That's affirm.
FALCON Endeavour, Falcon could you verify RCS thruster B3 up and the transponder off please.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/30/71, 11:55cdt, 99:22get, 264/1

FALCON Endeavour, Falcon. Can you verify RCS thruster
V3 OFF and the transponder OFF, please?
ENDEAVOUR I'll verify both those.
FALCON Thank you.
ENDEAVOUR And, Falcon, Endeavour, uncocking the latches
now.

FALCON Okay.

PAO We have about 2 minutes now before Apollo 15
goes behind the Moon on the 11th revolution. Both spacecraft,
Endeavour and Falcon, appear to be in very good shape at the
moment, and we'll be giving the crew a go for undocking and
separation, which will occur at about 100 hours 13 minutes
56 seconds right on the scheduled flight plan time.

CAPCOM Okay, Apollo 15, Houston. You're go for
undocking. You're 45 seconds from LOS and we observed your
rendezvous radar test. Falcon, also, we have not seen you
reset the DAP.

FALCON Okay. Understand. I'll get the DAP reset
and the tape meter looks like it works fine.

CAPCOM Very good, Dave. Glad to hear it.

PAO And we've had loss of signal. That last
report from Dave Scott that the tape meter appears to be
working well. That's the - one of the onboard indicators
used to read out the rendezvous radar and also the landing
radar altitude and altitude rate information, and is one of
several means available to the crew and to the guidance system
for getting that needed information. As Apollo 15 went around
the corner, the spacecraft was in an orbit of 61.9 nautical
miles at its high point and 9.4 nautical miles at its low
point passing over the landing site. Apollo 15, Endeavour
and Falcon, will be undocking, as we said, at 100 hours 13 min-
utes 56 seconds which will be shortly before we reacquire the
spacecraft on the 12th revolution. During the 12th and 13th
revolutions, Al Worden will be tracking a crater near the
landing site, Index Crater. Now this information will be
used to update the knowledge of where the landing site is
precisely and also where the spacecraft orbit is with respect
to the landing site. Now this information will be fed into
the Falcon computer just prior to powered descent. Shortly
we're going to replay the video tape of this morning's tele-
vision transmission from the spacecraft in lunar orbit and
we'll be reacquiring in about 45 minutes. This is Apollo
Control at 99 hours 32 minutes.

END OF TAPE

PAO This is Apollo Control. We're now about 2 minutes from re-establishing radio contact with Endeavour and Falcon. And when next we hear from the 2 vehicles, they should be separated and moving apart at the rate of about 1 foot per second. About a second after separation, Al Worden was to fire the thrusters on the Command Module for about 3 seconds to give them that 1 foot per second separation velocity. The Flights Dynamics officer reported that we're seeing a consistent downtrack error of about 15 000 feet per revolution. This is not unduly large, and is the sort of error that will be taken out by targeting the powered descent at the time of ignition and also by updating the state vector or the LM guidance systems knowledge of the orbit that it is in. This sort of an error can comfortably be removed prior to the beginning of the powered descent. And we're coming up now on 30 seconds until reacquisition. The first order of business will be to confirm the undocking and separation. And the guidance officer has just reported that a review of the erasable memory on the Lunar Module shows that the LM guidance system erasable memory is in very good condition. And we've just had acquisition of signal.

CAPCOM Endeavour, Houston. Standing by for a SEP report.

FALCON Okay, Houston. This is the Falcon. We didn't get a SEP, and Al's been checking the umbilicals now on the probe.

CAPCOM Okay, we didn't read that except NO SEP.

PAO Dave Scott reporting we have not gotten separation. They said they were going to be checking the probe umbilicals. We'll stand by for further reports.

FALCON Okay Houston, Falcon. We got no SEP, and Al's going back into the tunnel to check the umbilicals now. And I guess we'll stand by for your recommendations.

CAPCOM Okay, Falcon. We copy. And we'll have some words in a minute.

FALCON Okay.

FALCON There was not even any motion on the probe.

CAPCOM Roger. We copy.

CAPCOM Falcon, Houston. We have no probe temp, which indicates the umbilical is probably not well connected.

FALCON Okay, well that's just what he is checking. Thank you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 100:21 CDT 12:56 266/1

CAPCOM And 15, Houston, be advised that we have plenty of time here on the sep. 40 minutes or so, procedures will be to get vertical or get -- now get vertical on the orb rate ball and standards sep procedures.

SC Okay, fine. We can handle that.

PAO To recap the situation here, you heard Dave Scott report that we did not get a separation. The preliminary indication is that we may have an umbilical that is not properly connected in which case power would not flow to the probe and this appears to be the most likely cause at the moment. The Flight Dynamics Officer has reported that we can go up to about 40 minutes without separating before we run into problems in on-time powered descent.

SC Rog. Okay.

CAPCOM Apollo 15, Houston. We're seeing the telemetry on the probe now. I presume that may have been our problem.

FALCON Okay, very good.

ENDEAVOUR Okay, Dave. I'm venting you down now.

FALCON Okay, good show.

ENDEAVOUR And that probe was loose in the -- the umbilical was loose in (garble)

FALCON Okay, I'm glad you found something.

PAO The indication here on the ground that we had --

FALCON Give us about 5 minutes or so and we'll be all set.

CAPCOM Okay. And there's plenty of time to get a good hatch integrity check.15 and do the procedure leisurely.

FALCON Okay, Ed. That's in work now.

PAO The indication here on the ground that we had a loose umbilical to the probe was a -- an off scale high temperature reading on the probe which indicated that the umbilical was not connected. Al Worden on the inspection confirmed that indeed, the umbilical was loose. We presume at this point that we'll be able to go ahead with a normal undocking.

FALCON -- under verb 6 NOUN 20.

CAPCOM This is Houston, go ahead.

FALCON Okay, the GET was 100 0856 and CSM 35975 10818 35995. The LM 30009 28836, zip, zip, zip, zip four.

CAPCOM We copy.

CAPCOM And Endeavour, Houston. Reminder you want to sep in the local vertical attitude.

ENDEAVOUR Roger, understand local vertical.

FALCON Houston, Falcon. You know, we've -- you might run out an attitude and a time and it might save a little gas.

CAPCOM Okay, in 2 minutes we have an angle of 55.7. We're working on one for 5 minutes later.

FALCON Go ahead.

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 100:21 CDT 12:56 266/2

FALCON Al is going to take fairly sizeable manuever and it takes a little while to manuever two-tenths of degree per second.

CAPCOM Roge, understand. We're getting another for you for 5 minutes from now.

FALCON Better make it 10.

CAPCOM Yeah, we'll have one for every 5 minutes, Dave.

FALCON Okay.

CAPCOM And 15, Houston. We're not going to be able to make the T24 this pass, we don't believe. So don't worry about it.

ENDEAVOUR Rog.

PAO T24 is the landmark tracking of the landmark near the landing site which Al Worden was scheduled to perform from the Command Module. We'll be doing that again on the next revolution. And at the moment we're standing by for another attempt at undocking and separation.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/30/71 GET10031 CDT1306 267/1

CAPCOM Endeavour, Houston. Let's head for an inertial pitch gimbal angle at the 30 degrees and we may have to touch that up, but that's approximate.

ENDEAVOUR Okay, Houston, Endeavour. Going towards 30 degree pitch.

CAPCOM That's affirm A1. And Endeavour, Houston that angle is good for 100 hours and 38 minutes and it's not very critical we'll use it anytime around there.

ENDEAVOUR roger, Houston.

PAO Our Guidance and Control officer estimates that it will be about 6 minutes before the spacecraft are in the proper attitude for separation. This is Apollo Control, at the moment we are awaiting the spacecraft to maneuver into the proper attitude for separation, again to recap our separation was to have occurred about 4 minutes prior to reacquiring spacecraft on the 12th revolution. Dave Scott, once reaquired reported that separation had not occurred. On the ground we noticed at that time an indication of a high temperature - off scale high on the probe assembly which indicated that we possibly did not have electrical power to the probe, which in turn, is an indication that the umbilical is either not connected or not firm in its seating. On removing the hatch and inspecting the tunnel, Al Worden reported that this was, in fact the case and he tightened up the umbilical. The hatch has now been secured and we would expect to have a normal separation. The principal effect of the late separation will be to remove the possibility of doing the landmark tracking which Al Worden was scheduled to do on this revolution.

ENDEAVOUR This is Endeavour and I'm all set up again the tunnel's in and the pressure is good.

FALCON Okay, very good. Give me a minute. Okay.

ENDEAVOUR And I will stop the maneuver at local vertical.

FALCON Okay, have you - are you in attitude hold now?

ENDEAVOUR Negative. Will be in just about another 10 degrees.

FALCON Okay.

PAO That's Al Worden and Dave Scott talking back and forth between Endeavour and Falcon.

ENDEAVOUR I said I need about 1 minute to get P47 up.

FALCON Okay.

ENDEAVOUR Okay, Dave about a minute and a half.

FALCON Okay, about a minute and a half until you get to your attitude?

ENDEAVOUR Till we're ready to SEP.

FALCON Okay, good.

ENDEAVOUR Okay, let's go on 1 minute.

FALCON Okay. You've got P47 running. You can go anytime you want to.

ENDEAVOUR Okay, I've got P47 running also.
FALCON 10, seconds.
ENDEAVOUR Roger.
FALCON Okay, we're on the capture latches good.
ENDEAVOUR Right.
ENDEAVOUR And you are on your own.
FALCON Okay, good clean SEP.
PAO You heard Al Worden and Dave Scott report
separation and we confirm that on the ground, a good clean
separation at 100 hours 39 minutes 39 seconds.
CAPCOM Endeavour, Houston. Be advised your current
attitude is a good one for your P52 if you'd like to hold it.
FALCON Okay, Ed if you think we can't get there for
the P44's.
CAPCOM Negative. You've only got 6 minutes
they say no way.
FALCON Okay. We'll hold this. Okay Falcon is going
to yaw in.
ENDEAVOUR And you've got 4 good looking gear.
PAO That was Al Worden confirming to Dave Scott,
and Jim Irwin aboard Falcon that they have 4 good looking
landing gears. The principal effect of the late undocking
is, as I mentioned going to be to delete the possibility of
doing the program 24 landmark tracking on this revolution.
We do have another opportunity on the next revolution to do
that landmark tracking, although, we would prefer to have
two revolutions of the tracking prior to the power descent,
we can get by with a single revolution of the landmark
tracking.

END OF TAPE

CAPCOM Falcon Houston. Low bit rate and copy please.

PAO We've had a drop out in communications while the spacecraft is maneuvering to a new attitude and we will be reacquiring on the high gain antenna shortly and that should clear up the communications. Again to repeat the situation on reacquiring the spacecraft at the beginning of the 12th revolution, Dave Scott reported that we had not gotten separation at the scheduled time. On the ground we had an indication through a high temperature indication telemetered back from the spacecraft that perhaps the umbilical to the probe assembly was not firmly connected. On inspecting the assembly, Al Worden found that this was in fact the case. He reseated it in it's receptical, closed out the hatch area, and at 100 hours 39 minutes 39 seconds we again attempted successfully this time the undocking and separation. With no electrical power to the probe assembly, the undocking could not occur. The probe is electrically actuated and when it receives the proper electrical signal it extends and gives you the separation. At that point the command module piloted by Al Worden, fires thrusters to increase the separation rate at about 1 foot per second, and this was successfully done on the second try. Again the principle effect of this late separation makes it impossible to do the land mark tracking on this revolution. We will do it on the succeeding revolution and this should be adequate for the powered descent. We would expect at this point that the landing will occur at the normal time.

CAPCOM Okay, Falcon. We're reading you well now. Give us high bit rate, please.

FALCON Roger. High bit rate.

FALCON And Houston, we're ready to go with the dip throttle check whenever you are.

CAPCOM Okay, we're ready. Let's go.

FALCON Okay.

CAPCOM Endeavour, Houston. Give us P00 and ACCEPT. We have a uplink for you.

ENDEAVOUR Okay, P00 and ACCEPT.

ENDEAVOUR Got it.

CAPCOM Roger, Al.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 100:48 CDT 12:23 269/1

ENDEAVOUR Got it.
CAPCOM Roger, Al.
ENDEAVOUR Minimum is 11, (garble) 52, MAX 100.
FALCON Copy.
FALCON LST is 11, (garble) is 51, MAX 100.
CAPCOM Copy.
CAPCOM And Falcon, Houston. We didn't see the throttle actuator move on that test. Check your Deca power circuit breaker, please.
CAPCOM Endeavour, the computer is yours.
ENDEAVOUR Endeavour, Roger.
CAPCOM Say again, Dave.
FALCON Okay, you want to run it again, real quickly Ed?
CAPCOM Okay, was the circuit breaker out?
FALCON I'll take a look at it again. Yes, Rog. The circuit breaker is out.
CAPCOM Very good.
FALCON Okay, do you want to look at the test again?
CAPCOM That's affirm, Falcon. Let's have it again, please.
FALCON Roger, will do.
FALCON Okay, Ed CDR Data 11 (garble) 11, MAX 101.
CAPCOM We copy. And it looks good this time.
FALCON Okay, and the circuit breakers still in.
CAPCOM Roger, Roger. And we're ready to give you an uplink if you'll give us P00 and DATA please.
FALCON Stand by. Let's run the LMP check here.
CAPCOM And it looked good here, Falcon.
FALCON Okay, thank you.
CAPCOM And Falcon, Houston. Do you know if the circuit breaker was out or did it pop? Can you verify either?
FALCON No, I can't verify either. We checked them over before undocking and I can't tell you whether it popped or if it was open.
CAPCOM Okay, we understand. Thank you.
FALCON Roger.
FALCON Okay, Houston. We'll take the uplink anytime you want to give it to us.
CAPCOM Okay, here she comes.
FALCON Okay, Endeavour, Falcon. We're going to run the radar checkout now.
CAPCOM And Falcon, the computers yours.
FALCON Roger.
FALCON Falcon, Endeavour. I mean Endeavour, Falcon.
FALCON Okay, Houston, Falcon here. Would you give Endeavour a call. Tell them we're going to run the radar checkout now. We seem to have lost contact.
CAPCOM Roger. Endeavour, Houston. Falcon is calling and he's ready for the rendezvous radar check.

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 100:48 CDT 13:23 269/2

CAPCOM Endeavour, Houston. Do you copy?

CAPCOM Endeavour, Houston. Endeavour, Houston. Do you read? Endeavour, Houston. Over.

FALCON Endeavour, Falcon. Endeavour, Falcon. Simplex A and B, how do you read?

ENDEAVOUR Read 5 square, Falcon.

FALCON Okay, well we lost you there somewhere along the way. We need to check out the radar and Houston seems to not be able to get a hold of you either.

ENDEAVOUR Okay, I'm in.

CAPCOM We're reading you now, Al.

ENDEAVOUR Okay, Ed. I was off here for a couple of minutes reconfiguring inside here.

CAPCOM Roger. Okay, Al. If you'll go back to simplex A then we'll give you the voice ranging we'll and check out the radar.

ENDEAVOUR Okay, I'm simplex A.

FALCON Okay, voice ranging coming up. We're going to check the radar.

FALCON Endeavour, Falcon. You got your transponder on?

ENDEAVOUR Roger. Transponder's on.

Say again, Falcon.

FALCON Okay, Endeavour. Falcon. Can you give us your range please.

ENDEAVOUR Okay, Fal -

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 GET10059 CDT1336 270/1

FALCON Okay, Endeavour, Falcon. Can you give us your range please.

ENDEAVOUR Okay Falcon. Stand by one.

FALCON Endeavour, Falcon.

ENDEAVOUR Hello Falcon, this is Endeavour. How do you read now.

FALCON Yea five by. Can you give us your range please.

ENDEAVOUR Okay, stand by one.

ENDEAVOUR Okay. .4 Dave.

FALCON Okay. .4 we're looking at .78.

ENDEAVOUR Rog. Let me reset.

FALCON Okay, reset.

ENDEAVOUR I have you at .41 now.

FALCON Okay, maybe we're just in to close. We're looking at .79. We'll press on.

ENDEAVOUR Roger.

CAPCOM Endeavour, Houston. We're going to recommend you skip your P52. Fido's satisfied with your alinement and we're ready with your circ burn circ pad any time.

ENDEAVOUR Roger, Houston, Endeavour. Stand by one.

CAPCOM Endeavour, Houston. Did you say standing by?

ENDEAVOUR Yea, Houston, Endeavour's ready to copy.

CAPCOM Okay, Al. We'd like for you to go ahead and start going to the burn attitude I'll give you the roll pitch and yaw and you can get that in, then I'll give you the rest of the pad.

ENDEAVOUR Roger, Houston. Go ahead.

CAPCOM Roger. 000 107 358.

ENDEAVOUR Roger understand. 000 107 358. I'll put that in and be right back with you.

CAPCOM Roger.

ENDEAVOUR Okay, Houston. We're manuevering go ahead with the rest of the pad.

CAPCOM Okay. CIRC SPS G&N 37 679 plus 049 plus 104 GET is 101 38 58 19 plus 00683 minus 4 zero's 1 minus 4 zero's 7 000107 358 00649 plus 00543 00683 004 00572 sextant star 10 1713 400 the rest in A GDC aline Vega Deneb 288 340 346 ullage 4-jet 14 seconds.

ENDEAVOUR Roger, Houston. Understand. P30 pad CIRC burn SPS G&N 37 679 plus 049 plus 104 101 38 58 19 plus 00683 minus 00001 minus 00007 000107 358 00649 plus 00543 00683 004 00572 10 1713 400 Vega Deneb substars 288 340 346 4-Jett 14 seconds.

CAPCOM That's a good read back Al, and I have an eraseable change for you.

ENDEAVOUR Okay, Go ahead.

CAPCOM Verb 21 Noun 01. Address 1765 and enter 016 05.

ENDEAVOUR Understand Verb 21 Noun 1. Enter 1765 enter 016 05 enter.

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 10059 CDT1336 270/2

CAPCOM That's affirm and thats a short burn constant
change Al.
ENDEAVOUR Rog.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/30/71 GET 10108 CDT1343 271,1

CAPCOM That's affirm and that's a short burn
change, Al.
ENDEAVOUR Rog.
CAPCOM And, Al, be advised that your sextant star will
be occulted at 10116 7 minutes from now and a gentle reminder
this is a single bank, Bank B burn.

ENDEAVOUR Rog.
CAPCOM Okay PDI zero pad when both vehicles are ready.
FALCON Falcon's ready.
CAPCOM Roger, Falcon and did you get the circ GTI?
FALCON Affirmative Ed.
CAPCOM Okay.

ENDEAVOUR Endeavour, you ready for a PDI zero pad?
ENDEAVOUR Endeavour is ready.
CAPCOM Okay PDI zero Alpha 102 39 35 35, Bravo plus
01 000 plus all zeros, plus 00018 01383 plus 00090, 01 001
034 000 273 01 596 plus 01 000 plus all zeros plus 00024.
Cocoa 103 40 2400, Delta 105 22 3000. Readback.

FALCON Okay, Houston this is Falcon with PDI zero
readback. 102 39 35 35, plus 01 000 plus all zips, plus
00018 01383 plus 00090, 01 001 034 000 273 01 596 plus
01 000 plus all zips plus 00024. 103 40 2400, 105 22 3000.
Over.

CAPCOM Good readback Falcon and Al did you copy?
ENDEAVOUR Endeavour copied.
CAPCOM Roger, roger.

PAO Al Worden has maneuvered the Command Module,
Endeavour into the proper attitude now for the circulariza-
tion burn. That maneuver will be performed near the end of
this revolution, after the spacecraft goes behind the moon,
and we'll place the command module in a more or less circular
orbit. At the beginning it will be about 64.9 nautical
miles by 54.3 and over the next few days the affects of the
lunar gravity will modify that orbit so that at the time
Falcon rendezvouses with the command module it will be roughly
a sixty mile circular orbit. The maneuver will be performed
on the command module using the service propulsion system
engine producing a change in velocity of about 68 feet per
second. We have about 8 minutes now until we lose contact
with the two spacecraft.

FALCON All right Falcon, Houston we copy, thank you.

END OF TAPE

CAPCOM And Endeavour, Houston. Your go for circ
as soon as you get your short burn constant. Over.

ENDEAVOUR Okay, Ed.

CAPCOM And we observed it here. over.

ENDEAVOUR Okay.

CAPCOM And Falcon, Houston. (garble) vector.

FALCON Go ahead, Houston. Ready to copy.

CAPCOM Roger. 100 000 and 00006.

FALCON Roger. 100 000 0006.

CAPCOM I think we needed 00006.

FALCON Okay, understand. 4 zeros 6.

CAPCOM That's right.

CAPCOM To Apollo 15, Houston. We are about 1
minute from LOS. We seem to be caught up and everything is
looking good from here.

FALCON Falcon, Roger. Thank you.

ENDEAVOUR And Endeavour, roger. Thank you.

PAO And we've had loss of signal on the 12th
revolution at 101 hours 38 minutes or about 14 minutes from
now, Al Worden will be performing the circularization maneuver
in the Command Module Endeavour. This will entail a 4 second
burn with the main engine on the Command Module, the SPS
engine, placing the CSM in a more or less circular orbit
about 64.9 by 54.3 nautical miles. This maneuver is per-
formed at -- at the time that it is in order to put the
Command Module in the proper position for any subsequent
abort and rendezvous should that become necessary. It's
preferable to do a rendezvous from the 60 mile circular
orbit. Coming up on the next revolution, one of the
principle activities will be to accomplish that landmark
tracking which had been scheduled to occur on both REVs
12 and 13. This will place added importance on getting the
landmark tracking on rev 13. The upcoming revolution.
The tracking is performed from the Command Module by Al Worden
using the scanning telescope. He'll be taking marks at on Index
Crater near the landing site to improve the knowledge of
where the landing site is and also the orbit. And this
information is used in updating the Lunar Module
guidance system just prior to the beginning of powered descent.
As you heard, CAPCOM, Ed Mitchel, advised Dave Scott and Al
Worden and Jim Irwin. And we appear to be caught up at
this time and everything appears to be in good shape for the --
for the powered descent. At 101 hours 26 minutes, this is
Apollo Control.

END OF TAPE

PAO This is Apollo Control at 102 hours 8 minutes and we're about 2 minutes from reacquiring the Command Module Endeavour, assuming that the circularization burn was performed on time. Endeavour should be behind but above the Lunar Module Falcon. The higher orbit that the Command Module would be in would cause it to pop around the corner so to speak sooner come into view of radio antennas about 2 minutes prior to the time we'll acquire the signal from the Lunar Module. Just a few minutes ago, Flight Director Glynn Lunney again reviewed the status of the Mission with each of his Flight Controllers, and pointed out that the major activity on this revolution - the last revolution prior to the powered descent, will be the landmark tracking, which Al Worden will be performing in the Command Module. Al Worden will be taking marks through the scanning telescope in the Command Module on a 1000 foot diameter crater, called Index Crater, which is in the Landing Elipse - the marks that he takes on this crater are telemetered to ground where we feed them into the computers in Mission Control, and from that compute new orbits for both the Command Module and the Lunar Module, and also compute these orbits with respect to the precise location of the landing site. This information is then fed into the Lunar Module Guidance System - the Guidance Computer on the LM, just prior to the powered descent. Should we not get the Landmark Tracking on this revolution, the preference would be to wait for 1 revolution to do the Lunar Landing - slip the landing 1 revolution and attempt to get the Landmark Tracking on the 14 revolution. At this point we would see no reason for not accomplishing successfully, the Landmark Tracking on this revolution. And we have had acquisition of signal from the Command Module, which that indicates we did get the circularization burn.

PAO At the present time our radio signal strength from the Command Module is still too weak to permit voice communications. We are starting to get some telemetry data. And we're about 40 seconds away from reacquiring the Lunar Module, Falcon.

PAO ENCO says we appear to have lost contact. Madrid reported we had a momentary acquisition of signal, which has since dropped out.

CAPCOM Endeavour, Houston. Standing by for your burn status.

CAPCOM Endeavour, Houston. Standing by for burn status.

ENDEAVOUR Hello Houston, Endeavour. Rog. Stand by 1.

CAPCOM Roger, Roger, Al.

ENDEAVOUR Okay Houston. The burn got off on time. Burn time 4 seconds (garble) 00009 and I trimmed that to 0 at

END OF TAPE

ENDEAVOUR 009 and I trimmed that to 0 at roll of 0 pitch of 107 and yaw of 358. VGX was plus all zero's VGY was plus all zero's. VGZ was minus 00005. Delta VC was minus 11.2 fuel was 29.25 oxidizer 29.15 and dump valve meter was decreased 50. And I've got me in a 65.2 by 54.8.

CAPCOM Okay, Al. We got everything except the item after the burn time.

ENDEAVOUR Roger. The VGX at shut down was minus .9, 0.9.

CAPCOM Okay, we copy.

CAPCOM And Al. I'm ready to give you a P24 pad when you're ready to copy.

ENDEAVOUR Okay, Ed. Go ahead.

CAPCOM Rog. 15-1 T-1 102 3727 T-2 4217 TCA 4357 T-3 4445 the attitude is nominal and you'll be off track 3 miles to the north.

ENDEAVOUR Roger, understand. 24 land mark tracking pad target 15-1 T-1 102 3727 4217 4357 4445 nominal attitude is off track north 3 miles.

CAPCOM Good readback.

ENDEAVOUR Rog.

FALCON Ed, I have some AGS cal numbers for you.

CAPCOM Okay, Falcon. Ready to copy.

FALCON Roger. The initial value plus 02 minus 04 plus 03 plus 02 plus 90 minus 07. Cal values plus 02 minus 04 plus 02 plus 21 plus 81 and minus 15.

CAPCOM Copied all of them.

PAO Those numbers look good -

FALCON And Houston, Falcon. We're ready to go with the DPS.

FALCON Okay, and we're ready to go with the DPS pressure check out any time you are.

CAPCOM Okay, we're ready press on.

FALCON Roger.

CAPCOM Endeavour, Houston. Give us narrow please on your high gain.

ENDEAVOUR Rog.

FALCON Okay, Houston, Falcon. We've done the descent start. The ambient pressure is down to 450 but the manifold pressure hasn't moved.

CAPCOM Stand by. Okay, Falcon. We believe turn you PQM off and, and, Roger, turn your PQGS off and probably your problem. The helium monitor, I think you got it inadvertently. And Endeavour we'll take P00 and ACCEPT.

ENDEAVOUR Roger, you got it.

CAPCOM And Falcon -

FALCON Oh yea Ed, thank you.

CAPCOM Rog. DPS looks good from down here.

FALCON Okay.

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PAO The descent propulsion system on the lunar module is pressurized and looks good at this time.

CAPCOM And Falcon, Houston. A couple of items, Dave do you have a warm feel for the LPD decal.

FALCON Rog, Ed it was right on.

CAPCOM Good enough and we'd like for you to take your propellant temp press monitor to ascent and give us an ox tank readout, please.

FALCON Oxidizer is 100.

CAPCOM We copy. Thank you.

PAO And Dave be advised that there will be no gyro bias updates or gyro drift updates.

FALCON Okay, very good.

FALCON Houston, Falcon going into landing radar check out now.

CAPCOM Roger, Roger, Falcon.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 102:21 CDT 14:56 275/1

CAPCOM Roger, roger, Falcon.
FALCON Altitude transmitter is 3.6. Velocity transmitter 3.8.
CAPCOM Okay, Endeavour, Houston. The computer is yours. You can start your maneuver.
CAPCOM Endeavour, Houston. The computer is yours, you can start your maneuver.
ENDEAVOUR Roger, Houston, Endeavour. Thank you.
CAPCOM Endeavour, Houston. We're recommending a half of a degree per second for your maneuver. You got quite a ways to go.
ENDEAVOUR Roger.
FALCON And a Houston, Falcon. The landing radar looks good up here.
CAPCOM Roger, it looks good here.
FALCON Rog.
CAPCOM Falcon, Houston. If you'll let us have P00 and data, we have uplink for you.
FALCON Roger.
CAPCOM And I have pads for Endeavour and Falcon when you're both ready.
FALCON Falcon's ready.
ENDEAVOUR Endeavour is ready.
CAPCOM Okay, here we go. With Echo 104 42 3000. fox trot, plus 01082 plus all zeros minus 00500, 01449. plus 00086, 01192, 036, 000, 270, 02825, plus 01085, plus all zeros minus 00493, golf, 107 37 3000, hotel, 109 18 4500. Read back.
FALCON Okay. Falcon with the readback and no PDI plus 12 1104 42 3000 plus 01082 plus all zips minus 00500 01449, plus 00086 01192 036 000 270 02825 plus 01085 plus all zips. minus 00493, 107 37 3000, and 109 18 4500.
CAPCOM Okay, you got cut out there. Your AG DELTA-VC confirm as negative at hotel 109 18 4500.
FALCON That's confirmed, Ed.
CAPCOM Okay, Endeavour, give us OMNI charlie, please.
ENDEAVOUR Endeavour on OMNI charlie.
CAPCOM Roger, and did you get the readbacks, Al?
ENDEAVOUR Endeavour copied them - copied the pads.
Roger.
CAPCOM Okay, here we go with india PDI pad; 104 30 1094, 1103 plus 00029 002 110 310 plus 56922; juliet 109 18 4500; kilo 107 27 30 00; lima 104 50 4967; MECO 109 18 4500; T2 is at PDI plus 23 9 --

END OF TAPE

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CAPCOM 00 T2 is at PDI plus 2039 nectar for 106 41
2005. Readback.

FALCON Okay, Falcon, with the readback. PDI 1 104 30
1094 1103 plus 00029 002 110 310 plus 56922 juliet 109 184500
kilo 10727 3000 Lima 10450 4967 109 18 4500 T2 at PDI plus 2339
and nan is 106412005.

CAPCOM Okay, the T2 time is at 20 39.

FALCON Roger. 20 39.

CAPCOM Let's try it again 20 39.

FALCON 2039, thank you, Ed.

CAPCOM Good readback.

CAPCOM Falcon, computer's yours.

PAO The flight activities officer reports that
Al Worden in Endeavour is nearly in the proper attitude for
the landmark tracking. That's scheduled to begin in about
8 or 9 minutes from now. The landmark will first come into
view over the horizon at 102 hours 37 minutes 27 seconds. And
it will be about 4 or 5 minutes after that before Worden actually
begins taking marks on the landmark. In reviewing our status
briefly, we've nearly completed the systems checkouts on the
Lunar Module and everything appears to be in order at the
moment both with the LM and the Command Module for the powered
descent, which will occur on the next revolution, 14th revolu-
tion. And we're standing by now for the landmark tracking which
Al Worden will perform from the Command Module Endeavour.

ENDEAVOUR Houston, Endeavour.

CAPCOM Go ahead, Endeavour.

ENDEAVOUR Roger, Ed. Just checking over the P24 pad
again and you didn't update the longitude (garbled). Did you
want to do that?

CAPCOM Standby. Negative, Al, go with the one
Endeavour low altitude.

ENDEAVOUR Okay.

CAPCOM Falcon, Houston. Over.

FALCON Houston, Falcon. Go.

CAPCOM Roger. Check your CO2 sensor circuit breaker
we're showing off scale low.

FALCON Okay. Circuit breaker's closed Ed.

CAPCOM Roger.

CAPCOM Endeavour standby for T 1 minus 30 seconds.

MARK.

ENDEAVOUR Roger.

PAO T1 is the time in which the landing site
land mark will first appear on the horizon.

CAPCOM Mark 1 minute. T2 minus 1.

ENDEAVOUR Roger.

CAPCOM Standby for 30 seconds. MARK. 10 seconds,

MARK.

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PAO Flight activities officer reports that Worden has begun taking MARKS and we're seeing those here on our data displays here in the Control Center. We'll get a qualitative assessment from Worden following the landmark tracking.

END OF TAPE

ENDEAVOUR Okay Houston (garble).
CAPCOM Roger Endeavour, how did you feel about them,

Al.

ENDEAVOUR Oh, I felt good about them, Ed. Right on.

CAPCOM Very good, thank you.

ENDEAVOUR No question about the land mark and every mark,

I have the crater centered, crater index.

CAPCOM Very good, thank you. And I have an update to
the PDI abort pad when Endeavour and Falcon are ready.

FALCON Falcon's ready.

ENDEAVOUR Endeavour's ready.

CAPCOM Okay, it's item kilo should be 107203000.

FALCON Okay, Falcon copied kilo is 107203000.

ENDEAVOUR Endeavour copies.

CAPCOM (garble).

CAPCOM Endeavour, Houston omni delta.

PAO The flight dynamics officer has confirmed

Al Worden's assessment of the landmark tracking. He reports that we appear to have gotten sufficient information from the landmark tracking to update the location of the landing sight, and this would appear to clear the way for carrying out the landing on the prime revolution on the next rev. We'll be getting a go for the power descent. On reacquiring at the beginning of the 14th revolution the command module Endeavour, now in a more or less circular orbit. Al Worden reported that the on board computations of the orbit following the circularization were 65.2 by 54.8, which is very close to what we had anticipated and we'll be getting a ground computation of that orbit before too much longer. It would appear from the information passed down to the ground by Worden that the circularization maneuver was almost precisely as planned. Both crews, Irwin and Scott aboard the Lunar module, and Worden aboard the command module are presently involved in making the final alignments of their guidance system platforms prior to the power descent.

END OF TAPE

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CAPCOM Falcon, Houston.
FALCON All right, go ahead, Ed.
CAPCOM Let's see if you can reach Endeavour and ask him to bring the high gain up Flight Plan angles, please. Plane of 69 114.
FALCON Roger. Endeavour, this is Falcon, how do you read? Roger, Houston would like you to bring up high gain to -69 and a 114.
FALCON Houston, Falcon, do you have the torquing angles?
CAPCOM That's affirm, we have now Falcon.
FALCON Rog, torque to 30.
CAPCOM Copy.
ENDEAVOUR Houston, Endeavour is up on high gain.
CAPCOM Roger Endeavour. And Endeavour, we copy your noun 93's.
ENDEAVOUR Okay, Ed, and I'll torque about in a minute.
CAPCOM Endeavour, Houston recommending monitor 92, noun 92.
ENDEAVOUR Roger.
FALCON Okay, Houston, Falcon. How's the B63 look?
CAPCOM Okay, Dave, looks very good. Times okay, and be advised both Endeavour and Falcon at P24 looked good there will be an update, but we feel very confident about it.
FALCON Okay, Falcon here, very good.
CAPCOM And Falcon, we'd like to see a VERB 47 down to the AGS please, and be advised that your platform with gyros and PIPA's are good shape and no updates to them.
FALCON Very good.
FALCON Houston, Falcon. While that's running through there, we are going back here on notes checking over the activation and one thing we missed there was just before undocking, we ran the suit pressure integrity check and the first time around, we got a greater than 3/10ths decrease in one minute, so we cycled through both regulators, did that test and came back and ran the suit integrity check again and it was just fine, it was about 1/10th in a minute.
CAPCOM Okay Falcon, we copy that. Thank you.
FALCON Okay.
CAPCOM Falcon, Houston.
FALCON Houston, Falcon, go.
CAPCOM Rog, Dave. Talk about reviewing notes, we did so also and we found one we'd like to pass to you before LOS.

FALCON Okay.

CAPCOM Dave, we are working out a procedure down here that we simmed and its in the event of a low thrusting DPS during PDI. We are prepared to call to you RCS thrust augmentation for one minute about one minute or a minute and a half into the burn, and recommend doing it on the LMP's TTCA if we have to do it at all. What do you think?

FALCON That's fine, we'll try that if we need it.

CAPCOM Okay, the procedures are very simple, we'll call it to you as we've measured your thrust.

FALCON Okay and I guess you'll call on and call off with the TTCA, is that correct?

CAPCOM We can, that'll just be a one minute . . . a one minute burst.

FALCON Okay, fine, and by the way, when we went by PDI zero we took a couple of hacks at the altitude, it showed 10 miles even.

CAPCOM Very good.

PAO We're about three minutes away now from loss of radio contact with the Lunar Module, however we won't be losing contact with the Command Module due to its higher orbit for about 7 minutes . . . 7 1/2 minutes. The contingency procedure which Ed Mitchell passed up to Dave Scott related to the use of the reaction control system thrusters on the Lunar Module in the unlikely event that the LM descent engine is significantly below normal in thrust. Normally that engine should produce about 9900 pounds of thrust, if the thrust level should be about 260 pounds low or more, it would be possible to make up the difference by turning on the reaction control system thrusters firing the 4 thrusters in the plus X direction adding to the thrust of descent engine. These 4 thrusters each provide about 100 lbs of thrust and we found by simulating this technique, if the thrusters are applied early enough in the powered descent, a normal landing can be carried out.

CAPCOM LOS, we'd like to see your 400 plus 30,000 before LOS.

FALCON Roger and (garble)

END OF TAPE

ENDEAVOUR Roger.

PAO We're about 1 minute now from loss of signal with the Lunar Module. And would like to reemphasize that that technique for using the reaction control system's thrusters is a backup technique. The normal procedure would be to use only the descent propulsion system for the breaking required for the landing the reaction control system thrusters would be used solely for attitude control. And in the unlikely event that we have a low thrust engine once we turn on the descent propulsion system then we'll have up the sleeve the possibility of using the reaction control system thrusters.

ENDEAVOUR Endeavour, Roger.

PAO We've had loss of signal with the lunar module, Falcon. We're getting weak signal strength from the command module, although we do have about 3 minutes left before we loose radio contact with Endeavour. And as Falcon went around the corner behind the moon we were showing the lunar module in an orbit of 60.6 at its high point and a 60.6 nautical miles, and with a low point of 8.5 nautical miles above the lunar surface.

CAPCOM Endeavour, Houston.

ENDEAVOUR Houston, Endeavour. Go ahead.

CAPCOM Rog. Al. Your a minute from LOS. We recommend on the next pass check your S-band squelch switch off.

ENDEAVOUR Rog. (Garble).

CAPCOM Thank you.

ENDEAVOUR Make sure it was (garble).

PAO We've had loss of signal with the - -

END OF TAPE

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PAO And, we've had loss of signal with the Command Module. When next we reacquire the Lunar Module, Falcon, will be about 25 minutes away from the scheduled time of the powered decent, the beginning of the powered decent to the lunar surface. And as both spacecraft went around the corner everything appeared to be normal. At this point we see nothing that would interfere with a normal landing. We'll be getting the - taking a final look at the status of the trajectory in both spacecraft on reacquiring, and at that time a decision for the powered decent will be made. However, as we say at the present time we see nothing that would stand in the way of a normal landing on the 14th revolution. At 103 hours 24 minutes, this is Apollo Control Houston.

END OF TAPE

PAO This is Apollo Control. We're about 4 minutes from reacquiring the Lunar Module Falcon, now on its 14th revolution of the moon. On reacquisition of the Lunar Module, the crew will be in final preparations for the powered descent. The Flight Dynamics Officer reported that results of the landmark tracking were all satisfactory. And, we're as far as the trajectory is concerned in good shape for the powered descent. We will have to steer out about 3.3 nautical miles of cross-range error and this will be taken into account in the targeting for the powered descent. I would like to run over the major sequence of events which will occur in the powered descent. At about 3 minutes prior to the initiation of the maneuver, Scott and Irwin will yaw 50 degrees left; this is to clear the Lunar Module antennas so that we have good lock-on, good communications during the early portion of the powered descent when the LM body tends to block the antennas without the yaw maneuver. Initiation of the powered descent is scheduled to occur at 104 hours, 30 minutes and 11 seconds ground elapsed time; and the nominal burn time would be about 12 minutes to the landing. For the first 26 seconds of the burn on the descent propulsion system engines, the throttle will be at MINIMUM; this is to allow the engine gimble to trim up, get everything going in the right direction before full thrust is applied. At about 26 seconds the guidance system throttles the engine to full thrust which is about 9900 pounds of thrust and is also the thrust level that is maintained throughout a good portion of the braking phase. After 3 minutes of burn time, the crew will yaw face up which is the normal attitude for landing radar acquisition. At this time, they will be in a position facing upward with their feet, so to speak, in the direction of travel and the LM will be gradually pitching into a more upright position throughout the powered descent maneuver. At about 4 minutes into the burn, we can expect to get landing radar data. This landing radar updates will begin feeding into the guidance system, improving its knowledge of how far above the lunar surface the Lunar Module is. And at about 7 and a half minutes into the burn, Lunar Module Falcon will pass over the Apennine front, clearing the mountains at a height of about 10 000 feet, passing about 10 000 feet above the mountains which at that point have an altitude of about 12 000 feet above the landing site. And at about 9 minutes, 24 seconds, we would reach the point designated Highgate, at which the Lunar Module pitches forward to give the crew their first visibility of the landing site. And at this point, they will be switching to Program 64 in the guidance logic which will carry them from an altitude of 7000 feet --

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PAO -- down to the altitude of about four or five hundred where they'll switch to Program 66 for the final descent. At this point, Dave Scott will most likely be flying with Automatic Attitude Control and he will be controlling the rate of descent manually from probably about four or 500 feet vertically down to touchdown. Because of the nature of this landing site there are several opportunities during the powered descent to update the guidance system's knowledge of where it is with respect to the landing site. We have had acquisition of signal with the Lunar Module. We'll stand by for a call to the crew.

CAPCOM Falcon, Houston. Falcon, Houston.

SC Houston, Falcon, go.

CAPCOM Roger, Falcon, we're ready for your asset bat on time and your E,D bat report.

SC Roger, Ed, the FM bats were on at 103 5045 and I'll check the E bats now. Okay, E,D batteries both check at 37 --

END OF TAPE

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FALCON And Houston, this is Falcon, ED batteries both check at 37 volts.

CAPCOM Copy 37 volts and I have an update to your PDI pad.

FALCON Roger, go ahead.

CAPCOM And Falcon give us P00 and data and we'll give you an uplink.

FALCON P00 and data. Go ahead with the pad.

CAPCOM Roger, India 10430059 noun 61 crossrange plus (garble) 0002 and your (garble) plus 56943.

FALCON Ed, (garble) I can not read you.

CAPCOM Falcon, Houston, how do you read now?

FALCON Read you loud and clear Ed. I'm ready for that update now.

CAPCOM Roger, India 104300854 noun 61 crossrange plus 00033 DEDA 231 plus 56943.

FALCON Roger, 10430 0854 crossrange plus 00033 DEDA 231 plus 56943.

CAPCOM Read back is correct and be advised that crossrange number means you're going from south to north. You'll probably see some roll during the PDI.

FALCON Roger.

PAO We're coming up now on 20 minutes until ignition for the power descent. The landing point for Apollo 15, A planes area boxed in by mountains on one side, actually on 2 sides and a rille on the third side. We'll put Falcon down about 1 mile from the Hadley Rille. They'll be coming about 2 miles to the south, rather to the north of the point where Hadley Delta begins to rise abruptly to an altitude of about 13,000 feet above the landing sight, and approximately 6 miles behind their approach path, about 6 miles from the touch down point to the east, the Apennine Front itself begins to rise up to about 12,000 feet, the highest peaks in that front about 15,000. And here in mission control we've switched over from the large display of the lunar surface that we've had up on our front plot board since going into lunar orbit. We now have the analog displays which will tell the flight dynamics officer how well the descent trajectory is progressing and includes abort lines that will tell him if any of the parameters or the characteristics of the trajectory are approaching unsafe limits.

FALCON Standing by.

PAO And our instrumentation and communications engineer reports that we should have lock on now with Endeavour. Al Worden in the command module.

CAPCOM Roger thank you.

CAPCOM Endeavour, Houston.

CAPCOM Endeavour, Houston. Endeavour, Houston, how do you

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CAPCOM read? Endeavour, Houston. You're on the scan limit. Go to reacq. when you're at the angle.

CAPCOM Endeavour, Houston, how do you read?

ENDEAVOUR Houston, Endeavour, loud and clear.

CAPCOM Roger Endeavour I have an update for the PDI India.

ENDEAVOUR Okay, Houston, go ahead.

CAPCOM It's 104300854, out.

ENDEAVOUR Understand PDI is 104300854.

CAPCOM Good read back.

CAPCOM Endeavour, Houston, we're ready for auto on the high gain please.

ENDEAVOUR Rog, auto.

END OF TAPE

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FALCON Rog, auto.
CAPCOM Falcon, Houston.
FALCON Houston, Falcon. Go.
CAPCOM Roger. We did not see the 231 load go in
could you verify that, please.
FALCON In worked.
FALCON There's the read out. I didn't put the 231
in you want that also, Ed.
CAPCOM That is affirmative, Falcon.
CAPCOM Okay, Falcon. Thank you.
PAO We're coming up now on 10 minutes until the
beginning of this 12 minute power burn to the lunar surface.
AT the initiation of this maneuver the command module, Endeavour
will be about 350 nautical miles behind the lunar module.
The command module will pass overhead at just about the time
the lunar module is touching down. Aboard the lunar module,
Falcon the crew has completed updating thier backup guidance
system. With the same information that has been loaded into
the primary guidance system.
FALCON How do you read.
CAPCOM Loud and clear, Dave.
FALCON Okay.
FALCON (Garble).
PAO And the crew has now switched on the guidance
program - program 63 which will guide the lunar module during
the initial portion of the power descent. The principal
breaking phase.
FALCON Descent 1 B (Garble).
FALCON Okay you ready for the DPS configuration card.
FALCON Rog.
FALCON ACP on the Laderman. DECA Gimbal AC closed.
FALCON DECA Gimbal AC is closed.
FALCON (Garble) the right logic is closed. Air control
circuit all closed except A open.
FALCON Roger, verified.
FALCON 8 scale 25 degrees per second.
FALCON 25.
FALCON Auto CDR.
FALCON Auto CDR.
FALCON Auto translation 4 jet.
FALCON 4 jet.
FALCON (Garble) couple, on.
FALCON On.
FALCON Gimbal enable.
FALCON Able.
FALCON Command over ride off.
FALCON Off.
FALCON Motor board stage reset.
FALCON Reset.

FALCON (Garble) Mim.
FALCON Mim.
FALCON Mode 3 to mode control.
FALCON Mode control.
FALCON AGS to auto.
FALCON Auto Auto.
FALCON Push button both resets.
FALCON Both reset.
FALCON Okay the throttle. Your's to Min and mine
to self stop.
FALCON Self stop.
FALCON You're clipping a little bit on the first part,
Jim.
FALCON Okay.
FALCON We're down here where I can take verb 40 noun 20.
FALCON Okay.
FALCON Okay.
FALCON On.
FALCON Say again.
FALCON AGS steering is in.
FALCON Okay.
FALCON Try for 5 minutes.
PAO A last look at the lunar module orbit showed
it to be in a orbit with a high point of 60.6 nautical miles
and a low point of about 8.1 nautical miles. The command
module, Endeavour is in an orbit of 64.6 by 53.8. And we're
now coming up on about 6 minutes prior to the beginning of
the power descent. Everything continuing to progress very
smoothly, and rather quietly here in mission control at the
moment.
FALCON 8 minutes.
FALCON Okay. (Garlbe).
FALCON Breaker is in.
FALCON Altitude transmitter. Altitude transmitter
is 3.7, velocity is 3.8.
FALCON Try for 4 minutes we're from - -
FALCON Reading me any better, now.
FALCON Yes.
PAO Flight Director, Glynn Lunney, at this moment
getting a final status for power descent.
FALCON Okay, go for the final trim.
CAPCOM And, Falcon, you are go for PDI.
FALCON Roger, go for PDI.
PAO During - -

END OF TAPE

PAO During the powered descent the crew will be operating with their microphones in the VOX modes, so that we not only hear the conversations that is expressly . . conversation expressly meant for Mission Control, but also any chatter between Irwin and Scott.

CAPCOM Do you read the Falcon.

ENDEAVOUR Falcon, Endeavour. Reading you loud and clear there, Dave.

FALCON Endeavour, Falcon, if you're reading, we're not reading you.

ENDEAVOUR Falcon, Endeavour. How do you read now?

CAPCOM Falcon, Endeavour is reading you loud and clear.

FALCON Okay, fine, thank you.

FALCON Go for one minute. Okay.

FALCON When our oxidizer . . they're low weren't they? Yes. (garble)

FALCON That's all right. Get accurate later on.

FALCON Houston, we're reading 87 and 85 on the fuel quantity.

CAPCOM Roger, roger. It'll come up here in a moment.

PAO We show a LM altitude now of 56,000 feet and the Falcon is in the proper attitude for a powered descent. Coming up now on 1 minute till ignition.

CAPCOM Mark one minute.

FALCON Okay, master arm is on, I have two lights.

Average G.

PAO 30 seconds now until ignition.

FALCON We have guidance. Go for ullage. Standby.

FALCON For ullage.

PAO 10 seconds.

FALCON Ullage go for the (garble)

Auto ignition. 11 percent, the override is on.

PAO LM engine is currently at minimum thrust, they'll be throttling up shortly.

FALCON Throttle up. Master arm OFF. Okay, master arm is coming OFF. Lights are OFF, looks stable, gauge depth looking a little higher than normal. Okay, they're a little higher than normal.

PAO Guidance officer says we've got good thrust, 9920.

FALCON (garble) gauged depth to about 20 high. Okay. Fuel it a little low, oxidizer is a little high.

CAPCOM Falcon, Houston, a 169 minus 02800.

FALCON Roger, minus 2 . . minus 02800, standing by for the enter.

CAPCOM You're go for enter.

FALCON Go for enter.

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CAPCOM Falcon, Houston. You're go at 2 minutes.
FALCON Roger, GO at 2. (garble) compare.
PAO Showing an altitude of about 46,000 feet now.
FALCON About 2 percent low on fuel and one.
CAPCOM Okay.
PAO The crew updated their guidance systems
targeting and it was tending to steer them about 2800 feet
downrange.
FALCON Peaked out 4 high.
CAPCOM Falcon, Houston. We're happy with your fuel.
FALCON Okay, that's nice to hear.
FALCON 3 minutes showing to zero. Altitude is good
H-DOT right on, Dave. Good. Still reading 2 percent low
and Houston is happy with us.
CAPCOM Falcon, Houston. You're go at 3.
FALCON Roger, Go at 3.
PAO Altitude now about 42,000 feet, velocity down
to about 3900 feet per second.
FALCON 3400 Delta H. Velocity light is out, delta H
looks good up here, Houston, what do you think?
CAPCOM Falcon, Houston, we agree with Delta H, accept.
PAO That's the landing radar data coming in and
I think, Scott just reported they're accepting that data.
FALCON Falcon, Houston, ED batteries check.
CAPCOM Copy.
FALCON 4 minutes, altitude is 2,000 high.
FALCON Okay, about 3 low. Fuel and oxidizer looking
good. And 1 percent. Dave, things are nice, look good.
PAO The primary guidance system thinks it's about
3,000 feet lower than it is, the radar should correct that.
FALCON (garble) 30. Altitude is 4,000 high, H-DOT
right on. Fuel and oxidizer good. Okay. Delta H 2,000.
PAO We're about 5 minutes into the maneuver now
and Glenn Lunney taking a status - GO all the way.
FALCON About 9 high
CAPCOM Falcon, Houston. You're GO at 5 and your fuel
quantity looks good here.
FALCON Okay, understand, GO at 5. Altitude is
3,000 high, H-DOT 10 high. Fuel and oxidizer good. Okay.
PAO Still looking good, velocity down now down to
2400 feet per second. Glenn Lunney making another status, says
we look good.
FALCON Okay. Fuel and oxidizer good. Delta H is
looking pretty good.

END OF TAPE

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CAPCOM making another status says we look good.
(garble)
FALCON Okay (garble) does look good. And the
Delta-H is looking pretty good.
CAPCOM Falcon, Houston. You're go at 6.
FALCON Roger. Go at 6.
PAO We're about 3 minutes now from the approach
phase, altitude about 2500 feet - 25,000 feet, correction.
FALCON Altitude a thousand high, H-DOT about
4 high. X axis override is up.
CAPCOM Falcon, Houston. Throttle down 7 plus 23.
FALCON Roger. 7 plus 23.
FALCON 7 minutes. A thousand high H-DOT just
about on. Oxygen's running about 1 percent low.
PAO Coming up on throttle down in about 3 seconds.
The guidance system will back off on the thrust to about
50 percent, 57 percent.
FALCON 22.
PAO And the crew confirmed throttle down and
on time.
FALCON Pretty.
CAPCOM (garble)
CAPCOM Oxidizer's good.
FALCON Okay.
CAPCOM Check the up manual.
FALCON No flags. Looks good.
CAPCOM Falcon, Houston. Decent 1.
FALCON Roger. Decent 1 and it looks like P64 at 923.
CAPCOM Roger.
PAO P64 is the final approach phase where the
Lunar Module pitches up for the astronauts first good look
at the landing site. Altitude now about 16,000 feet.
FALCON (garble)
FALCON MARK. Good.
PAO Guidance says it looks as if we may be
coming in a little bit south of the site, everything looks
good however.
CAPCOM Falcon, Houston. We expect you may be a
little south of the site.
FALCON Coming up on 8,000.
CAPCOM 8,000 feet.
FALCON Okay.
PAO Coming up on pitchover.
CAPCOM Feet.
FALCON P64 okay. And LPD.
CAPCOM LPD, coming right.

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FALCON 40 5,000 feet 39 39 38 39 4,000 feet 40 41
45 47 52 3,000 feet 52 52 51 50 47 47 2,000 feet 42.
CAPCOM Dave, got a good spot.
FALCON Good. 42 43 T 90 feet.
CAPCOM Falcon, Houston. You're go for 90.
FALCON 44, 45.
FALCON Rog. Go for 90.
FALCON 44 45.
FALCON 1,000 feet.
FALCON 45
FALCON 900.
FALCON 45.
FALCON 800.
FALCON 45.
FALCON 700.
FALCON 46.
FALCON 600.
FALCON 48.
FALCON 500.
FALCON 49.
FALCON Minus 17, minus 15. 400 and minus 14.
FALCON Have T66. Okay. 300 feet minus 11, minus 11
250, minus 11, 9 percent fuel, 200 minus 11, 150 minus 7
minus 6, 120 feet minus 6.
FALCON Okay, I've got (garble).
FALCON Minus 5 100 feet at 5, 9 percent fuel,
minus 5, 80 at 5, minus 3, 60 at 3, 50 at 3, cross pointers
look good, 40 at 3, 30 3, 25 2, 7 percent fuel, 20 at 1, 15
at 1, minus 1, minus 1 6 percent fuel, 10 feet minus 1, 8 feet
minus 1. Contact.
FALCON Bam.
FALCON Okay, Houston. The Falcon is on the plain
at Hadley.
CAPCOM Roger, roger, Falcon.
FALCON No denying that, we had contact.
PAO That was a jubilant Dave Scott reporting
Apollo 15 on the plain at Hadley.
FALCON ECS looks good.
FALCON (Garble) looks steady. Did you get the
landing radar open?
FALCON Yep.
FALCON Okay.
FALCON Standing by for T1.
CAPCOM Rog. Standby.
FALCON It looks good onboard.
CAPCOM Falcon, Houston. You're stay T1.
FALCON Roger, stay for T1.

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CAPCOM Okay.

FALCON Hey, looks good on (garble).

CAPCOM (garble)

PAO Falcon touched down about 12 minutes 20 seconds after the beginning of ignition. Almost like a simulation and everything with the Lunar Module appears to be in good shape. We copied the touchdown time at 104:42:29.

FALCON DSKY prepared for P12, Jim?

PAO Scott and Irwin have now switched their Lunar Module guidance program to program 12, which is the normal ascent program. This would be used in the event of any lift off from the lunar surface. At the moment everything looks very good.

END OF TAPE

FALCON See the little elevation in front of us there?
FALCON That one out across the Rille.
FALCON Oh hard to tell.
FALCON Oh we're not there. We're not too far from
Salyut I did find that. (Garble)
FALCON One foot per second too.
PAO Dave Scott reported the touchdown point appeared
near crater, which the crew has designated Salyut. This is
just, would appear to be just a few hundred from the planned
landing point.
FALCON Rog.
CAPCOM Falcon Houston you're stay for T2.
FALCON Okay. you.
FALCON Okay, stay for T2.
CAPCOM Endeavour, Houston, are you still with us?
ENDEAVOUR Rog Houston, Endeavour standing by.
CAPCOM Roger, your buddies are on the ground, and we'll
be along with you in a little while.
ENDEAVOUR Rog, Ed. I listened to most of it. Could pick
them up VHF all the way down, and in fact I just now lost
contact with them.
CAPCOM Roger.
ENDEAVOUR I had a beautiful view of the landing sight
going over, but I couldn't see anything.
CAPCOM We copy, Al.
PAO Falcon has now been on the lunar surface for about
13 minutes, and here at Mission Control we're watching the
systems closely. We've seen the descent stage propellant tanks
begin to vent as they should, and all the systems on the
lunar module appear to be normal. The LM is on a relatively
flat piece of ground. It appears to be pitched up and to
the left about 9 degrees. We still do not have a good
estimate as to precisely where the landing point is, however
Dave Scott did report that he -

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 10456 GET 1730 CDT 287/1

PAO -- 3 degrees. We still do not have a good estimate as to precisely where the landing point is. However, Dave Scott did report that he felt the landing site was close to the crater Salyut, which appears to be on the maps just a few hundred feet or so from the planned landing site.

CAPCOM Falcon, Houston.

FALCON Houston, Falcon, go.

CAPCOM Rog, on page 1-2 where you get to your setting your S-band to slue, I've got some new angles for you because of your attitude.

FALCON Okay.

CAPCOM It's a minus 7 --

FALCON Go ahead.

CAPCOM And a minus 58. Sorry, plus 71 and minus --

FALCON Copy (garbled).

FALCON Okay, a plus 71 and a minus 58.

CAPCOM That's affirm.

FALCON Okay, Ed, we'll give you a little quick summary here before we get on with it. The general terrain looks exactly like what you had on 14. And many of the craters that we use for ID were completely washed out with no shadows and that's probably because the topo data just wasn't that good. And I think we're sitting a little off in attitude but we're in fairly good shape. And when we get around to the sea we'll try and pin down the location exactly. I had a little bit of dust at 150 and completely obscured at 50 feet; it was IFR from then on down. And the rest of it, you can probably see it as well as we could.

CAPCOM Okay, Dave, we copy, thank you.

FALCON Rog.

CAPCOM Falcon, Houston, do you have an estimate of your landing site?

FALCON There's a long pause there, Ed.

CAPCOM Roger.

FALCON I think as best I could find, I think we're fairly close to Salyut, but I guess the best thing to do is to press on and get to the sea where we can take a look around. It's very hummocky and as you know in this kind of terrain you can hardly see over your eyebrows. There's very little to tell us exactly where we are in our local position.

CAPCOM Completely understand, Dave.

FALCON Okay, thank you, you can probably explain it to the folks back there better than I could.

CAPCOM Dick wants to know where Falcon crater is if you can see it?

FALCON I think we're in it.

CAPCOM That's what we figured.

APOLLO 15 MISSION COMMENTARY 7/30/71 10456 GET 1730 CDT 287/2

CAPCOM Endeavour, Houston.

ENDEAVOUR Houston, Endeavour, go ahead.

CAPCOM Rog, I have your camera pass point.

ENDEAVOUR Okay, just a moment. Okay Houston, Endeavour, go ahead.

CAPCOM Roger, Endeavour, rev 15 map camera min T start 105 5258, T stop 106 17 57. And your camera pan is the same.

ENDEAVOUR Okay, Houston, understand mapping camera and pan camera passes are the same. T start 105 5258 and T stop 106 1757.

CAPCOM That's correct. Your rev 16 map camera pan. Endeavour, Houston, give us P00 and accept and we'll uplink while we're talking to you.

ENDEAVOUR Okay, you've got accept and I'm in a (garble) maneuver right now.

CAPCOM Okay, leave it at P20.

ENDEAVOUR Okay.

CAPCOM And your T start 106 --

ENDEAVOUR Rev 16 ?

CAPCOM Roger, T start 106 5651, T stop 108 5519.

ENDEAVOUR Understand, T start 106 5651, T stop 108 5519.

CAPCOM That's a good readback, Al.

PAO Our preliminary estimate of the landing site location based on the Lunar Module guidance system numbers is that the landing site was about 1900 feet south of the targeted landing site. We probably won't be able to confirm that until the stand up of EVA when Scott will stand up in the hatch of the LM --

CAPCOM If you'll give us an ENTER, we can go ahead with the load.

FALCON Okay.

PAO During the standup EVA, Scott will stand up through the top hatch of the Lunar Module and survey the surrounding terrain. At this point, we should get some landmarks that will allow us to pinpoint the landing site a little more accurately.

CAPCOM That's affirm, Falcon.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 CST1740 GET105:06 288/1

CAPCOM Endeavour, Houston, the computer is yours.
ENDEAVOUR Roger, Houston.
CAPCOM Endeavour and Falcon, Houston, could I talk
with a minute.
ENDEAVOUR Houston, this is Endeavour, go ahead.
CAPCOM And Falcon, Houston.
FALCON Go ahead Houston, Hadley Base here.
CAPCOM Okay, crew, the President sends his regards
through Doctor Fletcher, and I read, the President sends
his congratulations to the entire ground team and the Apollo
15 crew on a successful landing and sends his best wishes
for the rest of the mission.
FALCON Rog, Houston, thank you, our appreciation to
the President and I'd like to thank you too for the support
we've had.
ENDEAVOUR Houston, this is Endeavour thank you very much -
CAPCOM Roger, roger.
FALCON Houston, to Hadley Base here. Tell those
geologists in the back room to get ready because we've really
got something for them.
CAPCOM Which group of guys in the back room?
ENDEAVOUR Okay Ed. If you've got the gyro torquing angles
I'll talk about them in a minute.
CAPCOM Roger we copy.
ENDEAVOUR Okay Houston, Endeavour I'll wait until the
even minute to talk about them.
CAPCOM Roger on the even minute. Falcon, Houston
stand by on your stars and let us give you some new ones.
FALCON Okay, standing by.
CAPCOM Okay, the first pair, we will have star 3
in detent 3, star 12 in detent 6, second pair.
FALCON 3 in detent 3 and 12 in detent 6.
CAPCOM That's affirm. Second pair will have star 61,
that's Epsilon Orontius in detent 6 and noun 88, plus 109
75 plus 99373 minus 02127. Star 122 Schroter is your second,
it's in detent 3, noun 88 plus 54566 plus 09353 plus 83277.
And if your questioning, there weren't any other noun star
pairs available, apparently.
FALCON Okay, Ed. I understand for the first P57, it's
3 in detent 3, and 12 in detent 6, and as for the second
pair, it's star 61 in detent 6 and the noun 88 values are
plus 10975, plus 99373, minus 02127, and in star 122 in
detent 3 plus 54566, plus 09353 and plus 83277.
CAPCOM That's a good read back, Jim.
CAPCOM Falcon, Houston your vent is complete you
can terminate.
FALCON Rog, thank you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 105:16 CDT 1750 289/1

PAO This is Apollo control at 105 hours 17 minutes. We expect to have a update on the landing point for Falcon probably in about 15 or 20 minutes. The precise touchdown time that we copies here on the ground was 104 hours 42 minutes 28 seconds. And the duration of the power descent was 12 minutes 20 seconds. At the present time Scott and Irwin aboard the lunar module on the lunar surface are realigning the platform, the guidance system platform to the lunar surface. This is the alignment that would be required for a lift off from the moon. And we have about 2 minutes 30 seconds until we loose contact with Al Worden in the Command Module, Endeavour.

CAPCOM Endeavour, Houston. 1 minute till LOS. You're looking good from here.

CAPCOM Endeavour, Houston. 30 seconds to LOS. Do you read?

ENDEAVOUR Houston, Endeavour. Rog.

CAPCOM And you look good from the ground, Al. We'll see you on the other side.

ENDEAVOUR Okay, Ed.

CAPCOM Falcon, we copy your noun 93.

FALCON Okay, we'll torque them at 2230.

CAPCOM Stand by one.

FALCON Standing by.

CAPCOM Okay, proceed with your torquing.

FALCON On the way.

FALCON Okay, Houston. Standing by on the RLS.

CAPCOM Stand by one.

FALCON Okay.

CAPCOM Okay, let's reject those, Dave.

FALCON Alright reject.

CAPCOM Falcon, Houston. When the NOUN 88 comes up again. Hold it, please.

FALCON Okay, Houston. I didn't copy the name of the star, but Caster or Polux or Betelgeuse or somebody like that.

CAPCOM Okay, stand by. We'll tell you which one it is. We think it's in the middle of the belt, Dave.

FALCON Alinuk, Alinuk.

FALCON Yes, we got that.

CAPCOM Rog, it's the middle star.

FALCON Sure old garble.

CAPCOM Your right.

FALCON It's nice to see friends.

FALCON Okay, Houston. We can use this one, but we don't have the NOUN 88 for it.

CAPCOM Yes, you do. That's what we gave you, Dave.

FALCON Okay, we'll try it again.

FALCON Houston, why don't you read us the NOUN 88

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FALCON again then, please.
CAPCOM Roger. plus 10975.
FALCON Go.
CAPCOM Plus 99373.
FALCON Go.
CAPCOM Minus 02127.
FALCON Okay, that's exactly what we just loaded. We'll see where it takes us.
CAPCOM We're seeing it on the last register. We're seeing a minus 02124.
FALCON Sure that's just a round off.
CAPCOM Yes, you're probably right.
FALCON And, let's take a look at the NOUN 79, and that's not even close.
CAPCOM Okay.
CAPCOM Dave, we specified it for detent 6 and the computer's giving you detent 5.
FALCON I should have noticed that, Ed. I'm sorry.
CAPCOM Okay, Dave. The spiral should be about 330 and the curser about 148, if that helps.
FALCON Right on.
CAPCOM Falcon, Houston.
FALCON Go.
CAPCOM If you'd like some help being coached on to this next star. It's in Cassia Pia and we're suggesting detent 3, spiral of 181, curser of 23 and it should be just to the left of Navi the bright star to the left of Navi.
FALCON Okay.
CAPCOM And we'll give you NOUN 88 (Garble).
FALCON Okay, (Garble), Rog.
CAPCOM That's affirm.
FALCON Okay.
FALCON Okay, we'll cycle back, Ed.
CAPCOM Okay, Falcon, Houston. Observed your cycle back. We're going to have to rerun that first star again.
FALCON Yes, rog, Ed. The reason I did that was because we need to stick in a reasonable load on the NOUN 79.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 105:36 CDT 18:10 290/1

FALCON Okay, Houston. It doesn't look like the program is running exactly right.

CAPCOM What seems to be the problem, Dave, it looks good from here.

FALCON Okay, we'll try, but we are in a loop here where it won't accept a D10 6, I believe, but we'll press on.

CAPCOM Its always going to give the first one it computes, Dave. Change it to 6 and go ahead. Okay, Dave, you ready for your second now 16 9/88ths.

FALCON Well I think we got them on board if that's what you read us.

CAPCOM Rog, you're going great, keep going.

FALCON Okay, Ed, I have shade on.

CAPCOM Very good, Dave.

FALCON Okay, Houston, the torquing angles are up.

CAPCOM Roger, stand by. Okay pump.

FALCON Okay, there, Ed. And how about the RLS, do you want to take it?

CAPCOM Negative, Falcon.

FALCON Roger, on the negative.

CAPCOM Falcon, Houston, we need to redesignate the rendezvous radar to 180 270 00 for thermal protection.

FALCON 180 and 270.

CAPCOM That's affirmative. And Falcon, Houston. As soon as you get the radar parked, we are ready for the (garble) dump.

FALCON Roger.

FALCON Okay, Houston, here comes your E dump.

CAPCOM Roger, ready.

FALCON And Houston, we'll be standing by for your STAY/NO STAY.

CAPCOM Roger, and you have a STAY.

FALCON Got a STAY, thank you.

CAPCOM Falcon, Houston, we are going to delete the 10 minute delay so you can go right into P06 and power down.

FALCON Roger.

PAO This is Apollo Control. We're about 15 minutes from re-acquiring the Command Module Endeavour, Al Worden will be in his 15th revolution of the moon at that time, and about turned to 15 minutes behind the Flight Plan at the present time on the lunar surface in preparations for the standup EVA, however we do hope to make up about 10 minutes of that by deleting a portion of the activities and powering down the guidance system about 10 minutes earlier than called for in the Flight Plan. There is a possibility at this point that the standup EVA would be delayed slightly

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PAO . . . but, there also is an equally good possibility that the crew will be able to make up the time that they are behind, and it will be just a question of whether or not that time can be made up. When we reacquire Endeavour here in the Control Center, we'll be operating a split CAPCOM setup. The Spacecraft Communicator for the Lunar Module on the surface will be Astronaut Joe Allen.

FALCON E batt check 37.

CAPCOM Roger, roger, ED batts.

PAO On reacquiring the Spacecraft Communicator for the Lunar Module on the surface will be . . . yeah . . . Communicator for the Lunar Module on the lunar surface will be Astronaut Joe Allen and for the Command Module Endeavour, in lunar orbit, the Capcom will be Astronaut Gordon Fullerton. We are in the process of a shift handover in Mission Control, Flight Director Milton Windler is replacing Flight Director Glenn Lunney. We do anticipate a change of shift press briefing which will occur following the standup EVA and we'll give you a more precise estimate on that a little bit later.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 105:55 CDT 18:29 291/1

CAPCOM And, Falcon, Houston. We're having the changeover down here and didn't get a chance to say real good job on that descent.

FALCON Okay, thank you Ed. And appreciate all your help too. The com was super today and everybody back there was right on top of it all the way. We sure - sure appreciate that help.

CAPCOM Looked real good from here, Dave. We're seeing you on liftoff.

FALCON Okay, thanks Ed.

CAPCOM Hello Falcon, this is Houston.

FALCON Hello there Houston, how are you?

CAPCOM Super down here Dave and Jim. From what I heard it was not only a good landing, it was a great landing. And it sounds like you didn't even bend anything.

FALCON Well, I hope not, Joe. But we're sure in a fine place here. We can see St. George, it looks like it's right over a little rise, I'm sure it's much further than that. We see Bennett Hill. We see something off to our (garble) like 1 o'clock that's pretty good elevation, we're not too sure of that, but we'll give you some more details later on.

CAPCOM Roger. We're standing by.

CAPCOM Falcon, Houston.

FALCON Go, Houston.

CAPCOM Dave, we've got some vital questions down here. First, did you see the Rille on the way down?

FALCON Sure, Joe. Easy.

CAPCOM Roger. And did you read VHF call from Endeavour right shortly before the landing?

FALCON Negative.

CAPCOM Roger.

FALCON Why, did he have something to say?

CAPCOM I'm sure he did Dave, but we're wondering if you ever heard him call you on VHF. It sounds like we're going to have to do a VHF comm check.

FALCON No, we tried that comm check a few minutes prior to PDI and we got no response and Houston verified that the Endeavour could hear us, but we did not hear him.

CAPCOM Roger. We copy. And we have revs 16 through 20 lift off times when you're ready.

FALCON Okay, give us 5 minutes to clean up the cockpit here.

CAPCOM Roger, Dave. We're standing by. And be advised the backroom's doing slow rolls just from your first description there.

FALCON Okay, we've got a lot more coming. Standby.

PAO The backroom referred to by Joe Allen is the science support room here in Mission Control Center, which is manned by a team of scientists who will advise the Apollo 15

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 105:55 CDT 18:29 291/2

PAO crew on the lunar surface exploration in geology and such things as the deployment of the lunar surface science experiment package. The Flight Dynamics officer has given us a revised estimate on the landing site, which he admits will be superceded as soon as someone has a chance to look out the lunar module and identify a few craters. The preliminary estimate at this time is 300 feet north and about 300 feet east of the targeted landing site. As I say that is almost certain to be updated as soon as Dave Scott gets a chance to stand up in the overhead hatch of the LM and take a look around.

FALCON Okay, Joe, this is Jim, I'm standing by to copy some lift off data.

CAPCOM Roger, Jim. Lift off time for TD 16 108 39 45. T17 110 38 00. T18 112 36 13. T19 114 34 26 and T20 116 32 39. Over.

FALCON Okay, the readback Joe. 108 39 45 110 38 00 112 36 13 114 34 26 116 32 39. Over.

CAPCOM Roger, Jim. Readback's correct. Sounds good.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 10609 GET 1843 CDT 292/1

PAO This is Apollo Control at 106 hours, 10 minutes. We do not at this time have an update on the scheduled start time of the standup EVA. It obviously will not be at the scheduled flight plan time which is at this minute. The crew, once they get the cabin squared away, will have very little remaining before they can depressurize and open the hatch allowing Dave Scott to stand up through the overhead hatch and take a look around. CAPCOM Gordon Fullerton is at the moment conversing with Al Worden, aboard the Command Module Endeavour which has its scientific instruments in operation in the Sim bay at this time. Both cameras as well as the gamma ray and laser altimeter. Transcripts on these conversations will be available in the News Center. They are being recorded and will be put out on the tables in transcript form.

CAPCOM Go ahead.

FALCON Say, I think we need a couple words on the PLSS stowed on the cabin floor. We've got the two pins out on the side and can't seek to get it up. Do you have any good words on that?

CAPCOM Stand by, Dave.

FALCON Okay.

CAPCOM Falcon, this is Houston.

FALCON Go ahead.

CAPCOM Rog, Dave, we suggest you try first holding the bracket at the front in place while you push the plss aft and jiggle it.

FALCON Okay.

CAPCOM Falcon, Houston, any luck with the PLSS?

FALCON Oh, rog, sorry, yes, we got it up, that worked fine.

PAO This is Apollo Control. Our best estimate at this point is that the standup EVA will begin in about 15 minutes.

FALCON -- It sorta was.

CAPCOM Hadley base, this is Houston.

FALCON Go ahead there, Joe, this is Hadley base.

CAPCOM Dave and Jim, while you're working there, thought you'd be interested in the report that the SIM bay is giving us some remarkable data. It seems to be working beautifully.

FALCON Good, we hope we can compete with it.

FALCON Okay, Houston, Hadley base, vox, how do you read?

CAPCOM Okay, Dave, you're loud and clear.

FALCON Okay, we're configured.

FALCON Hey, Joe, how do you read me?

CAPCOM Five by, Jim, sounds great.

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FALCON Okay, we're configured, we're down to helmet and glove donning, and -- okay, red to red, blue to --

FALCON -- helmets.

FALCON I keep sliding to your side for some reason.

FALCON You're attracted to me.

FALCON On the LM, while in the LM it was the other way around slide to the right.

FALCON Okay, don the helmets and don the levas. Pictures first as per usual.

CAPCOM Roger, Dave and Jim, we copy, and just as a reminder we're starting to bite into the sleep period a little bit.

FALCON Okay, understand.

FALCON Okay, your helmet's locked. And (garbled). (Garbled) today, aren't they? Okay, verify the following, helmet and visor, liner adjusted. Yours are. Okay, red ones, lock, lock, blue, lock, lock.

FALCON The gas connected. Open, lock, lock.

FALCON Let me check yours. Okay, yours are okay. Okay PGA valves to horizontal.

FALCON That's a verify. E V gloves.

FALCON My gloves are on. Let me check yours. Okay, lock and locked check mine. Okay, you're locked. Okay, check, okay read to me.

FALCON Okay (garbled) gas to (garble, full egress, verify.

FALCON Verify. Cabin gas return, egress, verify.

FALCON Verify.

FALCON Circuit relief closed.

FALCON Closed.

FALCON Gas (garbled) A to egress.

FALCON A to egress.

FALCON Gas (garble) B direct O2

FALCON Direct O2.

FALCON Monitor sub gauge to 37 to 40.

FALCON Okay, cab pressure's coming up.

FALCON Pressure's coming up in the cabin. We might as well turn the urine line heater off.

FALCON Yes, go ahead for now.

END OF TAPE

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FALCON 3 marks off on the peg on the cup guage. (garble) I'll pick it up at 37. Yeah. Okay, there's 35. Right. 36, 365, okay. (garble) Reading 36. Okay. 1 Minute, Dave, you hack the time? Yeah.

PAO Irwin and Scott are currently running the suit, pressure and integrity check. Based on that we would estimate that the standup EVA would begin in about 10 minutes.

CAPCOM Endeavour is passing overhead, Al's got you in sight and I suspect there are two big cameras that'll be brought to bear on you a little later on.

FALCON Okay, very good, I'll Al can tell you where we are better than we can.

CAPCOM Al says you are just north of (garble)

FALCON Wait a minute, I've got . . North of Index, huh? Okay, I'm reading 34. Okay, Okay. I'm reading 34 at 2/10ths of a minute. Okay, suit circuit relief to auto, circuit relief going auto. Suit pressure should go down to 48.

CAPCOM And, Falcon, you are GO for depress.

FALCON Roger, GO for depress. Okay, we're down to almost 5 on the H, E60 S-cabin repress open. Having repress coming open. Over. Hey, overhead and forward dump valve open and auto at 3 1/2. Going open, I'll call you at 3.5. Do 4.5, 4.0, mark 3.5. Okay, back to auto. Verify cabin pressure 3.5 LM suit circuit 4.3. Okay, the LM suit circuit (garble) Locked up. Yeah, it looks like it is locked up. Say again. (garble) Hey, overhead and forward dump valve open and verify LM suit circuit 3 okay, I'm going open. Okay coming off the PEG. I'll hold it if you'll push it on there. Okay. Hey, hatch opening. Okay, partially open the overhead hatch. Okay, I'll read to you. Okay, go. Partially open the overhead hatch. Open, Dave? Yeah, I guess. Partially open. Dave, I might go auto on the dump here. Okay. Auto on the forward dump valve. Okay, the overhead hatch full open and latched. Okay, coming full open. Move over some Jim.

CAPCOM Dave and Jim, Houston.

FALCON Go ahead.

CAPCOM Roger, Endeavour places you very near November crater, very close to November crater.

FALCON Okay, a little short, huh?

CAPCOM A little short and a little north.

FALCON Okay, Dave, you got the hatch open? (garble) at about the LTG ISA. Push them all the way. Yeah. Give me a little . . want me to do. Nothing. Are you setting up there now?

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FALCON Yeah, just stand by. Okay overhead hatch is open and latched. Okay. Sit on the engine cover facing forward, unlock the drogue and rotate counter clockwise to release it. Okay. I'll block the sun on the instrument panel.

CAPCOM Well done, Jim.

FALCON (garble) device. Okay Jim. Boots coming out. (garble) you're breaking up again. Wait, wait (garble) okay, you got it? I've got it.

END OF TAPE

FALCON Okay give me the next step. Go ahead Jim
read the next step.
FALCON Houston.
FALCON Okay stand on the engine cover.
FALCON Oh, okay.
FALCON Hold on, get to work, very easy.
FALCON Master alarm.
FALCON Check.
FALCON Turn up the - the (garble) lights there.
FALCON Anything.
FALCON Oh boy, what a view.
FALCON Okay, there's nothing to go along with that
master alarm. Okay.
CAPCOM Falcon select seperator number 2 please.
FALCON That's water seperator 2?
CAPCOM Roger, water seperator 2, Jim.
FALCON Okay, can you -
FALCON Okay, stand by Joe.
CAPCOM Roger.
FALCON Okay there, Dave, I'm going to give them
sep. 2.
FALCON Go ahead.
FALCON Okay, I have sep 2 selected, Joe.
FALCON Did you reset the master alarm, Jim?
FALCON Yes.
CAPCOM Roger, Jim, we think you may be pinching hoses
back there somehow.
FALCON Okay. No they all look clear Joe.
FALCON Okay, Dave are you ready for me to hand you the
maps?
FALCON Yea, I can see Pluton and Icarus and Chain
Side there's St. George, Kimbal, Spur, beautiful.
CAPCOM Fantastic.
FALCON Okay, let's get a good fix, hand me the compas
there.
FALCON Okay.
FALCON (garble)
CAPCOM On the map.
FALCON It's the sun compas first. Let's get a take
on our position.
FALCON Actually at this sun angle Joe, there's no
direct sunlight coming into the cabin.
CAPCOM Roger, Jim, understand.
FALCON Okay, hand me the big overlay map, Jim.
FALCON Okay.
FALCON Let me know when you're ready for the camera.
FALCON Okay.
CAPCOM And Falcon, Houston. It looks like water

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CAPCOM seperator 2 is holding up fine.
FALCON Okay, good, Joe. Okay Joe our bearing to
Icarus is 338.
CAPCOM Copy.
PAO Icarus is a crater in the north complex. Scott
also reported being able to see St. George which is a crater
to the south of the landing sight on the flanks of Hadley
Delta.
CAPCOM Dave, be advised, we're going to be hussling
you along here. We think we know pretty well where you are
so maybe we shouldn't spend too much time just on location.
FALCON Okay, another quick one Bennet Peak is 255.
CAPCOM Roger.
FALCON Say Dave the first camera works with the 60
millimeter lense.
FALCON Okay.
CAPCOM Rog Dave maybe one more bearing.
FALCON Okay, coming up.
FALCON Make Hadley Delta at about 182.
CAPCOM Roger.
FALCON Here you go Jim.
CAPCOM And Dave, a bearing on a close feature if you
can identify it please.
FALCON I can't right now Joe.
CAPCOM Roger.
FALCON Get on with the photography here.
CAPCOM Roger, we agree.
FALCON Do you want 22 frames in the aerial span Dave.
FALCON Right.
FALCON And Dave, while you're firing them off there,
does the traffic ability look pretty good?
FALCON Yea, it sure does Joe. The largest fragment I
can see right now on the surface is probably about 6 to 8 inches,
however, inside the walls of Pluton, there are some pretty
big chunks.
CAPCOM Roger, We'll worry about those when we start
driving in Pluton.
FALCON Did you see the edge of the Rille? Dave can
you see the edge of the Rille?
FALCON No.
CAPCOM And Dave while you're swinging around there, do
you know if you can see November yet or not?
FALCON I don't Joe. I better try and get the photos
here and then start thinking about looking around.
CAPCOM Roger.
FALCON I think probably we owe you the photos first.
CAPCOM Roger we agree.
FALCON (garble) Dave, I've got the 500 handy.
FALCON Okay.

END OF TAPE

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FALCON Finish with that, Dave, I've got the 500 handy.
FALCON Okay.
FALCON Okay, Jim. Here's the -
FALCON Okay, I've got it.
FALCON Okay.
FALCON 500, now.
FALCON Got it.
FALCON Okay, Joe. I'm taking a picture now of that
bright fresh crater just to the south of the rim of St. George.
And now over to (garble) and window I believe.
CAPCOM Roger.
CAPCOM And, Dave, we're coming up on 15 minutes see
that.
FALCON Okay.
FALCON Finished with the 500, Dave. I have the
other camera.
FALCON Try not to shoot my foot there.
FALCON Looking back into the sun is almost useless
really blots everything out.
CAPCOM Rog, Dave any sign of the big mountain back
there?
FALCON Yes, you can see big rock mountain back there.
CAPCOM Roger copy, big rock mountain.
FALCON Okay.
FALCON Here I give you this one back, Jim.
FALCON Okay, I think we'll get a chance to get a lot
more of those.
FALCON Okay. Got it.
PAO Dave Scott is currently taking a series of
panoramic sequences using alternately a Hasselblad camera
with a 60 mm lens and one equipped with a 500 mm telephoto
lens.
FALCON Okay, Joe. We got all the photos. Here you
go, Jim.
FALCON Okay, I've got it.
FALCON And let me start by 12:00 o'clock Joe and I'll
go around real quick on the far distance horizon apparently
across the rille. I can see just about our 1 o'clock, now
a very large mountain which I'd have to call hill 305.
CAPCOM Roger.
FALCON And all of the features around here are very
smooth. The tops of the mountains are rounded off. There
are no sharp jagged peaks or no large boulders apparent any-
where. The whole surface of the area appears to be smooth
with the largest fragments I can see are in the walls of
Pluton. There are no boulders at all on St. George, Hill 305,
Bennet or as far as I can tell looking back up at Hadley.
Hadley's sort of in the shadow. It's a gently rolling
terrain completely around 360 degrees hummocky much like you saw
on 14.

FALCON The pitch line across the rille from Hill 305 around to 1 o'clock seems to be a slightly lighter in albedo with some height marks from craters, recent craters apparently. Bennet Hill also has a lighter colored albedo - one face of it, that facing the sun now is almost completely white. As I come around to my 2 o'clock, the horizon is really the northern complex. I can see, as I mentioned before, Chain, Anchrous, and Pluton very rounded subdued craters. It looks like the southern rim of Pluton is on the same level as our location here. The northern rim is somewhat higher, I'd say distance is difficult but maybe 50 meters higher. I can see the sun from the other side of the north rim of Pluton. All of it very flat smooth and gently rolling. Inside walls of Pluton are fairly well covered with debris. Fragments up to, I'd estimate maybe - oh 2 to 3 meters irregular no marring just sort of scattered around and maybe the walls have 5 percent fragments. I look on around and (Garble) our Mt. Hadley itself is in the shadow, although I can't see that the ridge line on the top of Mt. Hadley it too is smooth. I see no jagged peaks of any sort. The hill I would call number 22 on your map far distance also looks smooth and rounded no prominent features. I'll skip the distant field to my 6 o'clock because it's all in the shadow and looking into the sun, of course obliterates almost everything. As I look on down to my 7 o'clock I guess I see Index crater here in the near field. But back up on Hadley to the east of Hadley delta, again I can see smooth surface; however, I can see lineaments. I'll take a picture for you, there are some very interesting. Take Silverpass and look at 13 on your map I can't tell if it is 13 or 16 right now because of the sun. But they appear to be lineaments or lineations running - dipping through the northeast parallel and they appear to be maybe 3 percent to 4 percent of the total elevation of the mountain. Almost uniform, I can't tell whether it's structure or internal stratigraphy or what, but there are definite linear features there dipping to the northeast, at about - oh I'd say 30 degrees. As I look up to Hadley Delta itself, I can see what appears to be a sweep of linear features that curve around from the western side of Hadley Delta on down to spur down there. And they seem to be dipping to the east at about 20 degrees. These are much thinner lineations on the mountain than I saw before these probably are less than 1 percent of the total elevation of the mountain. The craters on the side of Hadley Delta are rather few. Around window and spur those that you see on your maps are the only ones I can see, and they appear to be about a dozen up in that particular area. I might associate those with a secondary cluster if I took a guess at it. I see nothing that indicates any flow down - or landslide

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FALCON down Hadley Delta, only some subtle change in topography. There is one bright fresh crater right next to St. George on the eastern side which is almost white in albedo, and it's got an injector blanket about a crater diameter away. How are you copying so far.

CAPCOM Superb description, Dave. Got every single word, beautiful. And we'll ask you to hustle on around and give us something on the near field, plus a comment on the ALSEP deployment possibility. Superb communication, though, beautiful.

END OF TAPE

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CAPCOM Sounds beautiful.

FALCON Okay, coming on around to St. George, which again is a very subtle old crater, but in this case I can see some ligaments running - dipping to the west at about 20 degrees parallel to the rim of the crater. These two are very small, less than a percent and continuous (garble) parallel. The rim of the crater is very subdued and smooth. Coming around I'll just take a quick look at the near field for you here. It's about generally the same. The crater density is I'd say quite higher, somewhat higher than I expected. Sizes are mostly less than about 15 meters. The only large crater that I see is what I believe to be Index back here about the 8 o'clock, and it has a very subtle rim, almost no shadow at the bottom of it. I think that's one of the things that was deceiving on the descent. There are very few deep dark craters in the area. Distribution of fragments appears to be less than (garble) percent. But the surface, they vary from a centimeter in size up to maybe 3 or 4 inches. Most of them appear to be angular. I see some white ones. I can give you some more of that out of the window. Trafficability looks pretty good. It's hummocky, I think we'll have to keep track of our position, but I think we can manipulate the Rover fairly well in a straight line and I can see the base of the Front. As near as I can tell, in fact I think I see where the front runs into level ground where we get that 5 degrees deflection. I see no boulders over there whatsoever. Looks like we'll be able to get around pretty good.

CAPCOM Roger, Dave. We copy.

FALCON And as far as ALSEP deployment, unfortunately looking straight ahead is zero phase (garbled) surface - -

END OF TAPE

FALCON The continuity of the surface that I see in our general position, I don't think we'll have any trouble taking the ALSEP out 300 or so and placing it. I just noticed a couple of items on the far side of the rill on the flat horizon (garble) west there, looks like a couple of very large boulders on the horizon just unique two of them, they are quite bright and quite sharp. I cannot see Hadley's Sea at all as we thought we might be able to. Minute peak is about all I can see in inspection of Head Valley.

CAPCOM Roger, Dave, is that down towards Head Valley?

FALCON Down. Yeah. That's correct. And the trafficability up to the northern complex looks the same, I see no large boulders, the slopes go up maybe 5-10 degrees at the most and beyond that all the terrain looks pretty smooth. I can see some young fresh craters in our vicinity which are sort of interesting in that there are some very small debris in the crater itself and on the rim and it's somewhat lighter gray than the general surface the degree being on the order of, oh, centimeters or so, but quite young and fresh. And I see a .. either at 9 or 3 o'clock a very deep crater, old crater, smooth, but I can't even see the bottom and I can't be more than 60 or 70 meters away. I think that's one I was avoiding on the way in. That very well be November.

CAPCOM Roger, Dave. And how far away do you think that may be. It sounds very exciting.

FALCON Those distances are very deceiving, I'd guess maybe 60-70 meters. There's another one somewhat deeper just to the north of that. It looks to me, if Jim has the same impression looking out the window, that we're much closer to Pluton and St. George and all that stuff than we expected to be.

CAPCOM Roger, Dave, we think it may just look closer to you, sounds like we are in business, Old Friend.

FALCON Yeah, it just looks closer, I'm sure, but we are indeed in business, and I think once we get through here and I hop back down, why we can talk over more of what I've been seeing up here.

CAPCOM Roger, Dave. You're coming up on 30 minutes into this SEVA and we don't have any more questions. You've answered everyone beautifully, outstanding.

FALCON Okay, Joe, I'll take another quick look around and see if anything looks unique. There's just so much out there, I could talk to you for hours. Do you have any specific questions before we call it quits?

CAPCOM Dave, we're hoping you will be talking to us

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CAPCOM For hours about it. We can't have any specific questions right now, we'll think about it and talk to you again once you button up. Maybe one last look for an ALSEP deployment position and we've copied that you've gotten both sets of pictures for us.

FALCON That's correct, Jim, I . . . I limited myself somewhat on the 500 because I think we'll get a chance to take a lot more of those, but I did get the pans for you.

CAPCOM Roger, Dave, we're quite satisfied and would like for you to climb back in now, please.

FALCON Okay, coming down.

CAPCOM Just out of curiosity, could you see any sign of the south secondary cluster?

FALCON There's a gentle rise, just to our south and I don't see anything that's really prominent as far as elevation, I think the elevation's on the models we have been working with were somewhat exaggerated, because I just don't see that much detail looking up towards Hadley Delta.

CAPCOM Roger, Dave, we agree. Sounds like it may well be hidden behind a sallow ridge there.

FALCON Well, we'll just have to go look for it. Okay Jim, want to hand the drogue.

END OF TAPE

FALCON I tell you Joe, this 1/6-g is really great.
FALCON (Garble)
CAPCOM Drogue is locked, want to verify that Jim?
FALCON I can't see as well as you can Dave.
FALCON It's locked. Coming down.
FALCON Okay, we'll close the hatch. Okay hatch
is closed. Hatch is locked.
FALCON Okay, both dump valves are AUTO, that's
verified.
FALCON AUTO and locked.
FALCON Okay, cabin repress gone to AUTO.
FALCON It's AUTO. It's verified.
FALCON It's dark in here.
FALCON Oh.
FALCON Okay, I'm going to push cabin repress cir-
cuit breaker when I turn around here.
FALCON Okay.
FALCON Cabin repress circuit breaker going in now.
FALCON Vent.
FALCON Vent cabin is at .5, 1.0.
FALCON Okay, Dave, we can go cabin. On the REGS.
FALCON Okay in the cabin.
FALCON Okay, I'm going cabin on both REGS.
FALCON Okay.
FALCON Okay, you going to read to me?
FALCON Yep, cabin warning light off. Verify cabin
pressure stable at 46 to 5. We're at 46. ENABLE and take off
gloves.
FALCON Okay, doff gloves and stow in top panel.
FALCON Okay, doff helmets with visors and stow in
helmet bags.
FALCON Okay.
FALCON Okay, verify safety on dump valve.
FALCON Okay. The head is on.
FALCON Okay. Closes, red to blue and blue to red.
FALCON ICS PTT.
FALCON Good bye, Joe.
FALCON Okay, Houston. Hadley base here. We'll
get the cabin cleaned up a little bit and you might want to
jot down some questions and as we eat we can maybe discuss
some with you.
CAPCOM Roger, Dave. We'll do that and be standing by.
FALCON Houston, Hadley base here. What do you
think the problem with our H2O separator is?
CAPCOM Standby Dave.
FALCON Okay.
CAPCOM Hadley base, Houston.
FALCON Go ahead Houston, Hadley here.
CAPCOM Roger, troops. While you're getting squared

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CAPCOM away there, regarding your question Dave on the set 1 unit. We think that you had some residual condensation in your hoses and when you stood up, it ran down into the separator and water logged it, causing it to go off the line. It'll drain, be draining and we think the next time we try it out it'll be okay. Over.

FALCON Okay, understand. But we haven't seen any water around lately, but there has been quite a bit of moisture on the windows. There was when we powered up we had to bring the heaters on for a while to get the windows cleared.

CAPCOM Roger, Dave, understand. We think the water was condensed in the suit hoses.

FALCON Okay, understand.

END OF TAPE

FALCON I think I know where we are too. If I can just look at that map. Be sure I get that all the way up.

FALCON Yea.

FALCON Okay.

FALCON Okay are you ready to do a little urine transfer?

FALCON Go ahead, you first.

CAPCOM And Hadley Base, be advised you're still on vox.

FALCON How about that.

FALCON Are you still vox?

FALCON No.

FALCON Down voice back up?

FALCON I bet we are. I bet we're hot mike.

FALCON Yea.

CAPCOM Dave and Jim, you're on hot mike now. But the medics are enjoying your comments.

FALCON Yea, I guess we are. I bet they are. Almost everybody else is too.

CAPCOM Laughter

FALCON What did we say Joe.

FALCON We need the circuit breaker in too for that -

CAPCOM You're clean.

FALCON Urine transfer.

FALCON Down voice back up. We're hot mike. Turn it off.

CAPCOM Falcon, this is Houston.

FALCON Go ahead, Joe.

CAPCOM Roger Jim, we have a question that may bear on this minor water problem. We're wondering if you can tell, or have a feel for whether you're in a crater, or the slope of the spacecraft is perhaps caused by just a general slope of the lorrain there. Any feel for that?

FALCON I'll ask Dave.

FALCON Houston, Hadley.

CAPCOM Go ahead.

FALCON I guess to answer your question, we're not really in a big crater anywhere. I think possibly, one gear may be in one of these small craters and as you might have heard Jim and I discussing, there's a rather high crater density and I guess my references to trafficability were really to boulders, because that's really most concerned with on driving the rover. There is a fairly high crater density around, and as I mentioned they range up to probably, 10, 8, 10 meters or so, and in our local area - let me give you a rough count of the oh, 8 to 10 meter ones, I guess 1 every 15 to 20 meters, so there's a fair number of medium craters. Nothing sharp no boulders and it may be that one foot pad is in one of these craters that range on down to maybe 2 meters or 1 meter, and then there's a sharp break in craters down to probably a foot or so, but it's almost like 14, as I remember their pictures

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FALCON quite a variety of crater sizes up to some certain limits. I don't see anything on this 25 meter scale that we hoped to expose the bed rock in our immediate vicinity, although, I can see some fresh ones, maybe some rims out through the window at 10 or 11 o'clock.

PAO This is Apollo Control at 107 hours 31 minutes. The news conference is going to begin in the MSC auditorium. We'll take air ground off this line now and tape for replay after the news conference.

END OF TAPE

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PAO This is Apollo control at 108 hours 3 minutes. All still going well at Hadley base, and we're still a minute away from acquisition of Endeavour, on the 16th revolution. We have 7 1/2 minutes of tape from Falcon that accumulated during the news conference. We'll play that now.

FALCON - - 11 o'clock, but I can't really account for our attitude right now. We'll just have to get out and take a look.

CAPCOM Roger, Dave. Copied all that loud and clear. I place my other question took poorly, apparently the thermal people were worried that if you were sitting right in the bowl of a fairly deep crater there would be a certain focusing effect of the sunlight that may require more water to keep the spacecraft cool later on. That's a good answer we have from you. Will have some more questions for you later on when your comfortable and into your eat period if your interested in talking at that time, and we'll be standing by.

FALCON Okay, Joe. There's so much here I could talk to you forever, but there's a large - I can see now we were in zero phase and without taking a close look out the front window I couldn't tell you. But, as I was coming down trying to select a spot to land I was trying to avoid these 8 to 10 meter craters, and we have one out of our 4 o'clock, I guess about 3 or 4 o'clock that I discussed before. There is one directly in front of us - almost - the rim is almost on the shadow of the radar antenna right now, and it appears to be 8 to 10 meter one. There's one over to our 10 o'clock their just all over, and it was sort of hard to find a spot that was really level.

CAPCOM Roger, we copy.

CAPCOM And, Dave, earlier you talked about specifically a very bright crater I think fairly near by. Could you estimate for us the size, distance, and azimuth of that bright crater?

FALCON Stand by. I can tell your still looking for our position.

CAPCOM No, that's not necessarily true. We think we're pretty well squared away on your position. This probably would sench you down.

FALCON Okay, as we're unsuiting here let me think that one over. I think we can sench it down too.

CAPCOM Roger.

FALCON But, before we go I got to tell you about a rock that's right out at 12 o'clock. Right almost at the radar antenna shadow, and it's going to be dark pretty soon. There's a dark black angular fragment which is on the order of possibly - I'd say 6 or 8 inches across, it's got some light colored apparent dust on it and it's unique on the surface, all the other fragments appear to be white. This

FALCON one really looks like a jewel. You can think about that for awhile.

CAPCOM Roger, we copy and it wouldn't surprise me at all if there wasn't some thought given to that rock.

CAPCOM And Dave and Jim when your comfortable we'll call up our best guess as to your position and let you think about that for awhile.

FALCON Okay.

CAPCOM And you'll be very pleased to hear that your landing was not recorded on either of our seismometers on the moon.

FALCON Well, that's nice to know. You can tell the program manager that we certainly didn't buckle his engine bell for him.

CAPCOM Roger.

CAPCOM And, Jim. I just have to ask you, did you notice if the contact light came on or not.

FALCON You didn't hear me.

FALCON Joe, I think Jim might simply quality what he thought was - what our landing velocity might have been.

CAPCOM Roger. I'd say when he was dividing every-thing by 10.

CAPCOM And Dave be advised our - -

FALCON No, I don't think so I think we're - -

CAPCOM Okay, Dave be advised the program manager says he'll wait until tomorrow until he decides about the engine bell.

FALCON Okay, well just tell him that I'll guarantee that it wasn't running when we touched down

CAPCOM Hadley base this is Houston. When you have a ECS configured properly we'd like to run a seperator number 1 check, please. And we'll ask you to go back to seperator number 1.

FALCON We understand, Joe.

CAPCOM Roger. WE'll be standing by.

CAPCOM And, Jim. This is Houston we would like a mark when you go to seperator number 1.

FALCON Okay, it'll be in a little while, Joe.

CAPCOM Rog. no hurry. We'll just know when to be watching.

FALCON Okay, Houston, Hadley, for com check on the light weight.

CAPCOM Roger, Hadley Base, copy your 5 by.

FALCON Okay, one suit and helmet stowed.

CAPCOM Roger, Dave. And Jim standing by for your call.

FALCON Okay, Houston. Hadley here if you want to give us the consumables update we'll take it.

CAPCOM Roger, Dave. Got them right here, and if your ready to copy, here they come.

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FALCON We're ready to copy.

CAPCOM The LM conceivable, RCS alpha, 85.0, bravo 85.5, 02 descent number 1 85, number 2 83.5, 02 ascent number 1 99, number 2 99, H2O descent number 1 79, number 2 80, H2O ascent number 1 100 percent, ascent number 2 100 percent. Amp hours descent 1705, ascent 572. Over.

FALCON Okay, copied all that. That looks pretty close to normal.

CAPCOM Not half bad.

FALCON Now do you want to run me a water test check?

CAPCOM Roger, Dave. We're standing by we're standing by for a mark.

FALCON Okay, stand by, Joe. 2 1 mark.

CAPCOM Roger.

CAPCOM Hello, Falcon. This is Houston. Just for your own information, water separator number 1 looks good. We'll be keeping a sort of an eye on it here. A little later on Gordo's gonna read up a procedure that involves VHF our communications check.

FALCON Okay, understand. Thank you.

CAPCOM And, Dave and Jim. We've got some positions when you get in a comfortable position, maybe have something to eat, but have your maps out. I'll read them up to you.

FALCON Okay, give us about 5 minutes.

CAPCOM Roger, Dave. No hurry at all.

CAPCOM Falcon, Houston. If your not busy I'll give you some switch positions to get set up for the VHF com check.

END OF TAPE

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CAPCOM Falcon, Houston. If you're not busy, I'll give you some switch positions to get set up for the VHF com check, over.

FALCON How much time do we have, Gordo?

CAPCOM Plenty of time, probably about 15 minutes before he comes over the horizon.

FALCON Okay, give us about 5 to finish fixing dinner here, it takes a while.

CAPCOM Okay.

FALCON Okay, Houston, Hadley Base here, go ahead with the switch settings.

CAPCOM Okay Falcon, this is Houston. You can go ahead and throw these switches as I call them. We'd like the VHFA transmitted to voice and the VHFA receiver on. That's a verify, over.

FALCON Roger, that's verify on both.

CAPCOM Okay, and the VHFA squaks we'd like you to adjust it, suggest so you can hear a little noise, and VHF antenna aft, over.

FALCON Squak is at a little noise and antenna aft.

CAPCOM Okay LMP, we suggest he makes a check, put his audio pannel, VHFA TR to TR and we're going to have Al initiate the check. He's kind of busy as he passes over, so he's going to initiate the check at a slack moment, and that'll be sometime between 10832 and 10844.

FALCON Okay, a couple of points. We don't have any mission timer and we'll be standing by and I'll have to do it because we have 1 lightweight headset that failed right when we picked it up after lift off. When we first unstowed it, we brought down so Al could have a good one.

CAPCOM Oh, okay fine. We think we know what the problem was. We think it's just an error in procedures, back before PDI and before the com check you were in voice slash range according to the timeline book, and that would block your transmitter and that's probably what's wrong. We really don't suspect any hardware problem.

FALCON Okay, we just talked it over, Gordo. After the radar check we went from voice range back to voice on the VHFA.

CAPCOM Yea, we realize that, but we think that comm check was before that, that you got back and that you just never did have another call after you got back to voice but blocking, that was my mistake a minute ago, the block was due to the blocking of your receiver while in ranging, over.

FALCON Okay, we're set up now and Jim's got his comm helmet on, so we'll be standing by for Al's call.

CAPCOM Okay, good enough.

FALCON And Houston, Hadley Base here. Anytime you want

FALCON to discuss the landing and our position, why I guess we've got supper cooked and we're ready.

CAPCOM Roger, understand that supper is cooked, or being eaten?

FALCON Yea, if you like cold tomato soup.

CAPCOM Oh mercy yes, delicious. Dave, I guess the first thing that we might start with, is our estimated position of your landing sight. Now we've got 2 inputs on that, Al, when he passed over, got what seemed like a pretty accurate tack on where you've landed and he calls it out as Bravo, Romeo 2 - Correction, disregard, Bravo Romeo 5 755. And in the back room the best guess from the back room is Bravo, Romeo 2752 in both cases it's very near November crater. It's just a question of on which side of November are you now sitting. So a tally ho on November crater will tell us I guess exactly. As it is we think we know where you are to within about 100 yards, over.

FALCON Okay, I tried to find November crater out there, Joe, and I could see a fresh one to the north of this Rim, but no bright ejecta as you see on the map there, but I guess I probably agree with you, and I might run through what I saw from pitch over on down, and that might help you out a little bit. It was quite a surprise.

CAPCOM Roger Dave, we're standing by. And by the way your comm is absolutely crystal clear. It's just beautiful.

FALCON Great, so is yours. Well anyway I got the 3,000 stop call, which was a good call, and as we came down prior to P64, I could see the rille to the south and I couldn't see it up over the nose, and I got the distinct impression, as I looked at Hadley Delta, coming into P64 that we were going to be way long. And I guess, as you know I've never shot one of these landings before and I got fooled a little bit there. And at pitch over we were definately quite a ways south and I never saw index crater all the way down. I saw what I thought was Salute, and the one north of Salute, which I sort of picked as a landmark to zero in on. I gave about 4 clicks right and then about 2 more right, as I remember to get us back up to the north and because we were south I lost the 4 craters in a row that lead into Index, but I believe the topo relief is somewhat exageraged in that our maps and models show good shadow and index and as good a crater as that is from orbit, it was very easy to pick up in orbit, I never did locate it on the decent. During visibility phase. But I was able to see earth light and that substiantiated your call of being 3,000 short. Now after I got over Aro to come back up north with the LPD's and Salyut, what I thought was Salyut I redesignated short to bring us back to what looked like a reasonably smooth area and then I just picked

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FALCON out the spot inbetween the holes down here and I put it down, and I guess I sort of have to agree with you that we're probably somewhere around November, and let me think a little bit and see if I can remember seeing something that looked like November.

CAPCOM Roger, Dave. We copy that.

END OF TAPE

CAPCOM Roger, Dave, we copy that. Dave, while you're thinking there, let me repeat a question I asked earlier. You described a bright, a very bright crater in one of your first descriptions and we're still looking for the azimuth approximate distance and size of that bright crater.

FALCON Well, the brightest crater I've seen is the one that was right on the rim halfway up St. George and it's almost white. Is that the one you're thinking about?

CAPCOM Stand by, Dave, I think there was another one. I'll - I'll get back with you on that in a minute. It was one that was a lot closer to you. And I've got another question now on the board in front of me here. We think you're near the edge of Aristillus/Aristarchus ray. And I wonder if you can recall anything about the local albedo changes. Over.

FALCON No, Joe, I didn't see a thing. And, it's just all the same north and south, east or west in our current position.

CAPCOM Roger, Dave, copy that and sorry on that crater call. That was my fault - the Aristillus/Autolyucus range.

FALCON Okay.

CAPCOM As you, I'm sure, understood. Dave, while you're sipping your cold tomato soup there, was the black rock that you called out to us on a crater rim?

FALCON Ah, yes it is, Joe, it sure is and it's a typical crater to see, it's quite a subtle crater but it's out - well, the LM shadow being like maybe 30, maybe 28 meters now. It's probably about 40 meters away, the rim of the crater and that black rock is sitting right on the rim.

CAPCOM Roger.

FALCON Hey, Joe, Jim's just pointing out another black one out that must be 300 meters out and it's so dark that it looks like a shadow; it's just coal black and it looks like it might be about the same size.

CAPCOM Roger, Dave, incredible. While you're peeking out there, do you have any further observations on the abundant size and distribution of the frags in the nearby field of view?

FALCON Yes, that's what we found here. Yes, I'd say that in the near field the surface is covered by probably less than one percent of fragmental debris and of that debris I'd say 70 percent of it is on the order of an inch to two inches or less. And maybe the other 30 percent seems to be in a range of maybe 4 or 5 inches, something like that, no large frags anywhere. They mostly --

CAPCOM Dave, let me interrupt a second, verify

APOLLO 15 MISSION COMMENTARY 7/30/71 10824 GET 2058 CDT 302/2

CAPCOM -- your slue, please.

FALCON That's verify.

CAPCOM Thank you, continue.

FALCON Okay, most the fragments are light colored except for the few that we mentioned to you. In fact they all look white; I can see some that are just stark white and some that are a lighter gray.

CAPCOM Roger, Dave, you might comment on the relative abundance and just for your information, you're coming up on a sleep period in about a half an hour, I guess.

FALCON Okay, understand, Joe.

CAPCOM And, (garbled) roger, go ahead, we had a site handover; it's complete now.

FALCON Okay, we heard that. Gee, I'm just looking down right in front of the LM here to try and give you the relative abundance and I was about ready to say that maybe of these inch frags there might be 5 or 6 of a square meter. And I see what appears to be a round, glassy ball - it's shiny, it casts a rounded shadow and it looks about the size of maybe (garbled).

CAPCOM Roger.

FALCON I can see some on the surface which appear to be from the descent engine and they radiate away from our position here. We'll take a closer look at those later.

CAPCOM Roger, Dave, and for the benefit of our fine Flight Director, maybe the name of that should be called an Aggie.

FALCON Okay, Joe, we'll call that one our first Aggie.

CAPCOM And Dave, the question on the bright crater you described it as the one near the LM with lighter gray debris in it. And I'm sitting here wondering if maybe that was November crater itself.

FALCON Okay, there was one and then bright debris, light colored around the rim, although it did not have a particularly raised rim, it was a level rim but there was a fair amount of debris around the rim, and that was out about, like 2 o'clock, I guess. Maybe you'd call that November. I guess what I was looking for relative to November was the bright which I don't really see.

CAPCOM Roger, we agree, it does look bright on our map here. Stand by for a call from Al if you could, guys.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 108:33 CDT 21:07 303/1

CAPCOM Falcon, would you give Endeavour a call, he's been trying you - evidently you don't read. Try it in the reverse.

FALCON Hello Endeavour, this is Falcon. How do you read?

CAPCOM Falcon and Endeavour, this is Houston. Evidently neither of you are reading each other. We'll stand by until we get overhead and give it another try. I'll give you a cue. Over.

FALCON Falcon, Rog.

CAPCOM And Falcon, this is Houston. We're suggesting that you proceed on with the PLSS charge and we'll be saying good night to you shortly. Coming up on your sleep period shortly.

FALCON Okay. And did that (garble) do you any good Joe?

CAPCOM Dave, those readings converge pretty well. They just don't decide between about a 100 meter error we think we had in the two possible landing sites. But you're very close to being exactly right on it.

FALCON Okay, fine.

FALCON Hello Endeavour, this is Falcon, you're loud and clear. How are you?

FALCON Hey it was super, it was super and we got the greatest place on the moon down here. Yeah, that's what they tell me. Say, did Houston get that fairly well up here?

CAPCOM And Falcon, this is Houston. In a few minutes while you're stowing the ETB we'd like for you to pick up the magazine and frame counts on the magazine from your two cameras please.

FALCON Well, we'll do the little things and you do the big things.

ENDEAVOUR Yes siree. Maybe we can get together and compare notes.

FALCON Okay, we're about ready to power down for the night and everything's in good shape down here. Everything's running well. All we got to do is get a little sleep and get out after it.

ENDEAVOUR Okay, Dave, see you in the morning.

FALCON Okay, have a nice night. Good night Al.

ENDEAVOUR Good night Dave. I'm keeping you're sleeping bag warm for you Jim.

FALCON Take care of everything up there.

ENDEAVOUR Certainly.

ENDEAVOUR Houston, Endeavour.

ENDEAVOUR Hello Houston, Endeavour.

FALCON Hey, Houston, Falcon. Endeavour's calling you.

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 108:33 CDT 21:07 303/2

CAPCOM Thank you, Dave. We're hearing him.
ENDEAVOUR What is it, shift change, Joe?
CAPCOM Al, no it's not, I think maybe we maybe on split S-band and you're transmitting to me instead of Gordo. What can I do for you?
ENDEAVOUR Well, I didn't change my frequency, Joe. Say listen I had a photo pass - -
CAPCOM Alfredo, are you still reading me?
FALCON Say, Houston, Falcon. By the way the VHF is crystal clear up here. Our comm is working great. Soon as you guys get squared away on the ground, I guess we'll all be tied together.
CAPCOM Roger, Dave. We read the conversation. We'll be standing by for report of successful PLSS charge and interested in getting you guys in the sack as quickly as possible. Also when you load up the ETB we'll be standing by for frame counts from your cameras.
FALCON Wilco.
FALCON Okay, Joe. I have some frame numbers, frame counts for you.
CAPCOM Roger, Jim. Standing by.
FALCON Roger. Mag L is reading 33. Mag K is reading 66. And mag metro is reading 20.
CAPCOM Roger Jim. Sounds like we got some beautiful shots already.
FALCON Beautiful scenery.
CAPCOM It sounds it.
PAO This is Apollo Control at 108 hours 44 minutes. We did monitor the conversation between Endeavour and Falcon on VHF. Communications check. Al Worden reported he could see the landing site very well. They exchanged some pleasantries. Each guy reported he was in good shape, then they said good night to each other.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 108:52 CDT 21:26 304/1

CAPCOM Hello Hadley Base, this is Houston. Regarding the water separator Number 1, just to give you a warm feeling, it is working perfectly now. It looks as though we just had a temporary . . temporarily there some water run down from the hoses and waterlogged it, but it's working perfectly now. Over.

FALCON Okay, Houston, thank you for passing it on.

CAPCOM Go ahead, Dave.

FALCON I'd like to confirm that on the LMP camera EVA 1 we use mag lima is that correct?

CAPCOM That's correct, Dave. Mag lima on the LMP camera. And we copied all the frame count

FALCON Okay, thank you.

CAPCOM And Dave, This is Houston. Did you copy for me that your water separator number 1 looks good again?

FALCON Rog, I thought I called you back on that, Joe, we got it, thank you.

FALCON Okay, Houston, Hadley Base has two charged PLSS.

CAPCOM Go ahead, Dave.

FALCON Rog, have two charged PLSS.

CAPCOM Roger, that sounds good. And Dave and Jim, this is Houston and if you . . if you are interested, I could probably arrange for a geology lecture here to put you to sleep.

FALCON Joe, I think that might . . that would keep us awake.

CAPCOM Roger, I agree. That was an outstanding job of describing your surroundings by you guys, I'm really . . all of us are looking forward to tomorrow.

FALCON Thank you Joe, I hope we get wound up and get out there and get close to some of this. It's really fascinating.

CAPCOM Hadley Base, this is Houston. Requesting telemetry switch, low bit rate, please.

FALCON Rog, low bit rate.

CAPCOM Hello, Hadley Base, this is Houston.

FALCON Go ahead Houston.

CAPCOM Roger, Dave, we're not to ask exactly for mark when you ingress the hammocks and by the way, I think the space program is the only place where a person can ingress a hammock, but we would like a status report on the two of you when you get comfortable. And a final thing, you might be interested the score of the All Star game at about half time is the Baltimore Colts 14, College All Stars 7. And we'll be standing by for your status reports. Over.

FALCON Okay, sounds like a pretty good game.

CAPCOM Hadley Base, This is Houston.

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 108:52 CDT 21:26 304/2

FALCON Go Houston.
CAPCOM Dave, before you get too settled there, I forgot to indicate that the Surgeon is requesting a radiation device readout to be included in your crew status report there.
FALCON Rog, We'll look into that, Joe, we'll get it.
CAPCOM Okay, fine Dave, I was afraid you would get in a position where you couldn't reach those devices.
FALCON Oh no, we weren't thinking of passing the surgeon. We just have a number of unscheduled housekeeping chores that we've got to get squared away here if we are going to settle down for 3 days.
CAPCOM Roger, understand. And we are in no hurry. I do want you to get a good night's rest though.
FALCON Roger.
CAPCOM And Dave, this is Houston. It sounds like you'll be able to carry out a very good experiment with your portable leaning tower of Pisa there.
FALCON Well, I'll tell you, it really doesn't seem to be leaning that much. We haven't noticed any . . well we can see it (garble) in here, but it's no real problem.
CAPCOM Roger.
FALCON In fact, what about 10 degrees at the most? Okay on the PRD if you are ready to copy.
CAPCOM Roger, go ahead.
FALCON Okay, PDR at 25 0 11, the LMP 08020.
CAPCOM Roger Dave, thank you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 CST 2205 GET109:31 305/1

CAPCOM Dave, this is Houston.
FALCON Go ahead.
CAPCOM Roger, apologize for the question, but are your radiation meters tucked away yet?
FALCON They sure are.
CAPCOM Okay, thank you.
CAPCOM Hello Hadley Base this is Houston, over.
FALCON What can I do for you.
CAPCOM Roger, Dave, we've got 2 good night questions for you here. But first we're trying to unravel some water pressure data and we, just needed to know if you charged the PLSS, using your checklist, or using the decal instructions on the PLSS, over.
FALCON No we used the checklist, (garble).
CAPCOM Roger, understand you used the checklist and charged it with water for the specified 5 minutes, then, over.
FALCON That's correct.
CAPCOM Okay, copy that, and, Dave, we've got a major discrepancy in your radiation dosimeter reading. It's either gone belly up on us, or we miscopied the number which you read. We'll have to ask you to read it again, please.
FALCON You know that we switched them.
CAPCOM Say again, Falcon.
FALCON You know that CDR, and CMP, PRD's were interchanged.
CAPCOM That's affirm Dave, and the last reading we got from Al was considerably higher than the one we got from you. The device is either broken or you're being unirradiated, which seems unreasonable, over.
FALCON Well all I can do is look in this very tiny window and look at these very tiny numbers and they say 2501, I guess I can give you a 7 on that one.
CAPCOM Roger, everybody's happy. Thank you Dave, and we have no questions from Houston. We'll say a pleasant good night to the two of you and look forward to tomorrow, over.
FALCON Okay, Joe, and since we don't have any alarm clock so if some body'll give us the word we'll be standing by.
CAPCOM I wouldn't be at all surprised, you're liable to get the word from down here. And it's been an outstanding day.
FALCON We've enjoyed it.
PAO This is Apollo Control at 109 hours 48 minutes. We said goodnight to the crew of Falcon at Hadley Base. Everything going well there. Goodnight time was 109 hours 46 minutes. Endeavour is not within range at the moment. We're about 13 minutes away from AOS, however we do not intend to talk to Endeavour anymore tonight either. Dave Scott and Jim Irwin got to bed a little late. We show a wake up time for them 6 hours 35 minutes from now. We'll take this line down now and

APOLLO 15 MISSION COMMENTARY 7/30/71 CST2205 GET109:31 305/2

PAO come up with hourly status reports. If there is any air ground from either spacecraft we'll come back up and give that to you. At 109 hours 49 minutes, this is Mission Control, Houston.

END OF TAPE.

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 110:00:00 CDT 2234 306/1

PAO This is Apollo control at 110 hours. We had a call from Falcon just a moment ago. Dave Scott reporting they were tucked into their hammocks. We have 40 seconds worth of tape between Dave Scott and capcom, Astronaut Bob Parker. We'll play that for you now.

FALCON This is Hadley Base. We're all tucked in, we'll see you in the morning.

CAPCOM Falcon, Houston. Did you call?

FALCON Rog. I just wanted to let you know that we're all tucked in, in our hammocks, and we'll see you in the morning.

CAPCOM Roger, Dave. Good night and don't fall out.

FALCON No way, Bob, no way.

FALCON There's no place to go if I did.

CAPCOM Copy.

PAO That's the end of the tape. We'll take the line down again and come back up with hourly status reports. At 110 hours 1 minute. This is mission control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 11026 GET 2300 CDT 307/1

PAO This is Apollo Control at 110 hours, 26 minutes. The Endeavour is in its 17th revolution now, and we have acquisition, we have not talked to Al Worden however. Conducting a by-static radar test during this pass and they desired not have voice communications during this test. Worden should be having his evening meal now as scheduled in the flight plan. He will be in a rest period on the next revolution, so we do not plan to talk to him again. All systems on the Endeavour look good on the 17th revolution. We've also said goodnight to Dave Scott and Jim Irwin in Falcon at Hadley Base. The LM systems are normal, looking good. The flight surgeon is monitoring the Lunar Module Pilot, Jim Irwin; he is not monitoring the Commander, Dave Scott. And the Flight Surgeon, John Zieglschmid, reports that is Irwin is not asleep he is well on the way, he is relaxed and resting from the appearance of his heart rate and respiration rate - his heart rate running near the mid 50's now indicating he is resting. At 110 hours, 28 minutes this is Mission Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 GET 111:26 CST 24:00 MC 308/1

PAO This is Apollo Control at 111 hours 26 minutes. All systems still looking good on FALCON. Flight Surgeon reports good sleep is indicated for Jim Irwin for the past hour. The Lunar Module Pilot is the only one he is monitoring in FALCON. He did not monitor biomedical data on Al Worden in ENDEAVOUR during this seventeenth revolution because of the bistatic radar test. He expects to monitor him during the next revolution. We have had loss of signal on ENDEAVOUR on the seventeenth revolution as it is passed behind the Moon. We're showing the cabin pressure in the FALCON 4.82 pounds per square inch; and cabin temperature 57 degrees. At 111 hours 27 minutes; this is Mission Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 112:26 CST 01:00 MC 309/1

PAO This is Apollo Control at 112 hours 26 minutes. The Command Module ENDEAVOUR is coming up on the FALCON'S landing site in it's eighteenth revolution. About 15 minutes ago we put in a call to ENDEAVOUR to get a better high-gain antenna configuration in order to improve the data we're getting from the Orbital Science Experiments. We'll play the tape of that conversation now.

CAPCOM Endeavor, Houston, Over.

CAPCOM Endeavour, Houston, Over.

CAPCOM Endeavour, Houston, Over.

CAPCOM Endeavour, Houston,

ENDEAVOUR Apollo to Houston. ENDEAVOUR.

CAPCOM Roger, Al, I'm sorry to wake you up again but we need require and narrow. With angles of pitch 25 yaw 185. Over.

ENDEAVOUR Okay Houston; you have got reacquire 0, pitch plus 25, and a yaw of -185. How do you read it?

CAPCOM Roger. Reads it much better now. Sorry about that. Goodnight again.

ENDEAVOUR Oh, that's okay. I wasn't asleep yet.

CAPCOM Oh, Okay.

CAPCOM Anything else you want to tell us?

ENDEAVOUR I just wondered what you wanted setting on the high gain, is all.

CAPCOM Okay.

ENDEAVOUR Okay, Bob understands mass spec discriminator too low.

CAPCOM Roger.

PAO That was the extent of the conversation with Al Worden. We don't expect to contact them again during this pass. We have not talked with FALCON since our final good-night from them at 109 hours 59 minutes. Dave Scott and Jim Irwin in FALCON have 3 hours 53 minutes remaining in their sleep period. All systems aboard the spacecraft still looking good. Cabin still holding at 4.82 pounds per square inch. Temperature, cabin temperature, 56 degrees. At 112 hours 31 minutes; this is Mission Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/31/71, 02:00 CDT, 113:26 GET, 310/1

PAO This is Apollo Control at 113 hours 26 minutes. We have observed and are tracking a pressure decay in the descent oxygen tanks of the lunar module Falcon. Pressures are reading slightly less than 100 pounds per square inch low. This is not a dangerous situation but we are looking at what the long-term effects may be if it continues. It's not rapid. It's very slow. There's a possibility that we may wake the crew early to do some troubleshooting. We'll keep you informed of the situation as it progresses and if we do put in a call to the crew we'll come up and stand by live on air/ground. All other systems are looking good and the cabin pressure is holding good, still holding at 4.82 psi. Command module Endeavour is out of contact now behind the moon. And the flight surgeon reports that the lunar module pilot whom he is monitoring appears to be sleeping well. At 113 hours 27 minutes, this is Mission Control Houston.

END OF TAPE

APOLLO 15, MISSION COMMENTARY, 7/31/71, CDT 3:00, GET 114:26, 311/1

PAC This is Apollo Control at 114 hours
26 minutes. We've had no conversations with the Apollo 15
crew men since we said good night to them several hours
ago. Endeavour is on it's 19th revolution of the moon now
and is just about to pass over the landing site of Hadley
Apennines. We're continuing to evaluate the long term affects
of the slow pressure decay in the descent oxygen tanks.
There is no impact on the mission at this time. It does
not appear now that we will awaken the Falcon crew until
the scheduled time, that's 1 hour 58 minutes from now.
When we do awaken them at the regular scheduled time, we'll
do some trouble shooting on this situation. Cabin pressure
is still holding at 4.8 pounds per square inch. Cabin
temperature still 56 degrees. At 114 hours 27 minutes,
this is Mission Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 115:25 CDT 3:59 312/1

PAO This is Apollo Control at 115 hours 25 minutes. Because of the busy time line the crew will have getting ready for EVA 1, flight director Pete Frank has decided to awaken the crew early and a call will be put into them shortly, to troubleshoot this descent oxygen tank problem. The pressure decay in both the descent tanks is attributed to a leak. The procedures that will be used be designed to locate the leak. These procedures have been completed just now and we expect CAPCOM Bob Parker to put in a call to the crew shortly. We'll standby live waiting for that call. This is Apollo Control 115 hours 27 minutes. Flight director is continuing to discuss the procedures with his flight controllers and with the CAPCOM. We'll continue to standby live. The CAPCOM will be putting in a call very shortly.

CAPCOM Falcon, Houston. Over.

FALCON Hello, Houston. This is Falcon. Go.

CAPCOM Roger. Good morning, Dave. We're waking you up an hour early because we've got a little problem onboard we need addressed. When you get a moment to get something to write it down, let me talk to you about it in detail. The problem we're looking at is a leak in descent O2 we're trying to determine whether we got a small cabin leak or a leak in the oxygen system itself. Over.

FALCON Okay. Understand, Bob.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 407 CST 115:32 GET 313/1

PAO This is Apollo Control. Flight director Pete Frank has just informed the flight controllers here that he does not consider this an emergency situation, however, he does want to protect the capability to complete all three EVA's as planned. That's why he made the decision to awaken the crew early and trouble shoot this problem.

CAPCOM Falcon, Houston. Are you ready to copy.

SC Stand by, Houston. Alright, Houston, this is Hadley. We're ready to copy.

CAPCOM Okay, Hadley. First thing we'd like is high bit rate that will allow us to look at some extra parameters particularly temperature to see how much of this fall is due to temperature effects, which we haven't experienced before. So if you're standing right there why don't you flip that on while I read you the rest of the pad, Jim.

FALCON Okay. We're high bit rate.

CAPCOM Roger. Thank you. The next step is descent O2 to close and why don't you do that now because the step following that is for the ground to monitor the descent O2 tank pressure and the cabin pressure and we're going to look and see if the leak, which we've seen so far is a drop in the tank pressure is due to a cabin leak or to a leak in the system itself. Copy.

FALCON Okay, I copy. Descent O2 is closed.

CAPCOM Roger. Stand by. Okay, Hadley. We'll be watching that. Then you might copy down the following steps to be performed depending upon our analysis of what we're watching right now. 1 if leak stops, upper and forward hatch valves, close and insure that the urines

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/31/71, GET 115:38, CST 4:12, 314/1

CAPCOM - and ensure that the urine QD is capped. Over.

FALCON Stand by one.

FALCON Houston, this is 15. We were just looking at the urine transfer device and that valve was in the open position, although the device wasn't capped.

CAPCOM Roger. Copy and understand that the receptacle or transfer device was attached to the hose at that - all night.

ENDEAVOUR That's affirm.

CAPCOM Roger. Stand by.

CAPCOM Okay, Jim, we'd like you to leave it in the configuration you found it in for a few minutes. Because that will allow us to verify that that's where the leak was. Over.

FALCON Okay. I'm going to open the valve again.

CAPCOM Roger. Thank you. I'll tell you, that's good news if that's what it is, man.

FALCON Understand on your first - Okay, on that first step that you read, instead of leaks off, to close both dump valves.

CAPCOM Roger. That's affirm. In other words, if we see that the leak has stopped here on the ground, we will then ask you to close both dump valves and also verifying the urine QD, and if the leak in the cabin - now, if the cabin is completely isolated - continues to hold, we will then ask you to open the hatch valves one at a time to verify that the hatch valves are not going to leak or which hatch valve is leaking in the open position. Some of that will be not indicated. If indeed it is, the urine QD that's capped. Do you copy, Jim?

FALCON Okay. Yes. We understand.

CAPCOM Roger. And, we'd like to verify right now just quickly that the descent O2 is closed; that the urine receptacle is back and it's original configuration. Over.

FALCON That's verified.

CAPCOM Roger. Let's just stand by here for a couple of minutes and we'll see how - what the ground has to tell us.

FALCON Bob, as long as we're talking about. Consumables - What are you showing down there for water? Because we are reading about 60 percent on descent 1 and 2 now.

CAPCOM Stand by, Jim. We'd better read our decals down here, too.

FALCON Bob, you did copy my question about the water quantity?

APOLLO 15 MISSION COMMENTARY, 7/31/71, GET 115:38, CST 4:12, 314/2

CAPCOM Roger, Jim, and we're having to read
our decals down here, too. It will take us a minute. We'll
be right back with you.

FALCON Understand.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/31/71, 4:18 CDT, 115:44 GET, 315/1

CAPCOM Jim, we have an answer for you on your water gage problem. The 50 that you're seeing indeed corresponds to a true 70 percent which indeed is the number that we were expecting to see. Over.

FALCON Okay. Fine, Bob. Thank you.

CAPCOM And Hadley Base, Houston. Over.

FALCON Go ahead, Bob.

CAPCOM Roger. It looks like your descent tanks are holding up very nicely, your cabin's falling slightly as you may have noticed on your meters. We'd like you to take - -

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 115:42 CST 4:23 MC 316/1

FALCON Go ahead, Bob.
CAPCOM Roger. It looks like your descent tanks are holding up very nicely; your cabin is falling slightly; as you may have noticed already on your meters. We would like you to take the uring recepticle off the hose and then put the QD cap on after you remove the urine recepticle. Over and ---, After you have done this, we will watch the cabin for a little bit longer to see that it stops also. Over.
FALCON Okay, that should work.
FALCON Okay, the urine recepticle is off but the other QD is on.
CAPCOM Roger, We're standby to watch what comes off down here on the ground.
CAPCOM And Jim will be sitting here in this configuration to watch the cabin again. It looked like you were getting pretty good sleep there for a while, Jim.
FALCON Say that again Bob.
CAPCOM Alright. It looked like you were getting a pretty good sleep there.
FALCON Yes sir. That's the best sleep I've had on the flight.
CAPCOM Roger. How was Dave doing?
FALCON Just fine, Bob. I was way down in sleep when you gave us a call.
CAPCOM Sorry about that Dave.
FALCON Oh no. That's okay. Let's get the problem squared away.
CAPCOM Yeah I figured we lost a little bit of sleep down here on the ground tonight. I couldn't even fall asleep at my console.
FALCON That is amazing.
FALCON Houston, Hadley. If you're not going to be busy I could copy the lift-off data from 21 to 27.
CAPCOM Roger Jim. Are you ready to copy them?
T21 is 188 3048; a negative that should be a 118. I guess you gathered that. T22 is 120 2900; T23 is 122 2710; T24 is 124 2521; T25 is 126 2332; T26 128 2144; T27 130 1954. Over.
CAPCOM Okay Bob. I'll give you a quick readback on that - on there. 118 3048, 1202900, 1222710, 124 2521, 126 2332, 128 2144, and 130 1954.
CAPCOM Roger. readback, Jim.
FALCON If you have the consumables, I will take that take that too.

END OF TAPE

APOLLO 15, MISSION COMMENTARY, 7/31/71, CDT 4:33, GET 115:58, 317/1

CAPCOM Roger, Jim. We're ahead of ourselves there.

FALCON Okay. Not no rush.

CAPCOM And, Falcon, Houston, over. We believe that we are very strongly convinced finally down here that indeed solves the problem. You can go back to descent 02 open. And we'd like to suggest that the procedure, when using that particular device from now on, will be to remove the receptacle when you are finished and cap it in a,- as we've just done. Over.

FALCON That's good news Com, we'll do that. And, gee the sleeping up here is really good and if you all ever see another problem like that, why, we'd be only to happy to roll over and take care of it. I think, as a matter of fact, we even sleep better if we knew you wouldn't mind waking us.

CAPCOM Roger. You can sleep better because, you know I can wake you up any way. The thing didn't drop out of your ear, apparently, Dave.

FALCON Oh no, I made sure of that.

CAPCOM You guys have about 22 minutes left, if you want to go back to sleep again.

FALCON Well, I tell you, we probably could. We were just talking it over. Both of us slept just as well here as we do at home.

CAPCOM Well, frankly, Dave, it's your guys option, if you want to lay down and take a little morning snooze, while the rest of us keep working down here. That's your option. I'm not sure that we want to, - we talked about starting the EVA earlier. I think that was kind of agreed upon before we start on time, wasn't it?

FALCON Yeah, that's right. We don't want to start the EVA early. We'll stick to the time line. But, I think we'll take advantage of the extra little bit of time here to keep things organized here. It takes a little while to settle down and get a system here, for us to really be efficient. I think we can make good use of the time.

CAPCOM Okay, you're the boss.

FALCON Well, we both feel pretty well rested at this point. And we'll just mush along here at a nice easy pace and hopefully be all ready by the time it's time to go out.

CAPCOM Okay, and when you are ready you can give me call, when you're ready for some updates, particularly concerning EVA planning, and I'll have a few good words to pass you then. When it's convenient.

FALCON Okay. We'll get breakfast cooking here, and then give you a call.

CAPCOM Roger.

PAO This is Apollo Control at 116 hours 5 minutes. As you heard, that oxygen problem was traced to an open urine dump valve, has now been corrected

APOLLO 15, MISSION COMMENTARY, 7/31/71, CDT 4:33, GET 115:58, 317/2

PAO and the problem solved. We'll continue
to standby live.

END OF TAPE

FALCON Houston, Hadley base. We've got another a little question here on your questioning last night during the PLSS recharge of the water. We seem to have some question as to whether we ran 5 minutes or not and I wonder if you had any indication we got less than the full charge on the PLSS.

CAPCOM Okay, Dave. Stand by I check.

CAPCOM Falcon, Houston. I guess last night the question came down to whether we could read it well enough down here on the ground, to the best of our ability down here to read this you've got a full charge, but apparently that plus a minus about a pound. But our readings down here for what there worth, so you got a good charge. Over

FALCON Okay. Understand. We felt like we did by looking at the sight gages, although on the first PLSS there were still a few little bubbles running through when we reached MAX time by looking at the sight guage. And on the second PLSS it was clear, oh within 4 or 5 seconds.

CAPCOM Copy.

CAPCOM Hadley Base, Houston. Over.

FALCON Go ahead.

CAPCOM Roger, Dave. It looks like we can tell you that to the present time our extrapolations indicate we'll have sufficient oxygen for a completely nominal mission, including the 23 charge on EVA-3. This PLSS recharge having high not enough pressure, with PLSS recharge with a hardest constraint and it looks like we need it although rather closely. Over.

FALCON Okay. Well we'll breath slowly and save as much as we can.

CAPCOM Copy.

FALCON Houston, Hadley. We've got another question for you since we're sitting here eating and looking around. Did you all by chance get the figures or descent rate of touchdown? We're just taking a look out here and it looks like we may have stroked the gear some and as near as we can recall we were coming down about a foot per second when we got the contact and we were just wondering if you had any data on that yet.

CAPCOM Stand by, Dave. We're getting that.

FALCON Okay.

CAPCOM Okay, Dave. We have an answer for you, which is that we were showing .7 feet per second up to touchdown and then at touchdown it appears that at the same point we got the ROLL and PITCH, but we picked up to something like 3.7 feet per second at that point. Over.

FALCON So we went from .7 to 3.7 from contact to touchdown. Is that right?

APOLLO 15 MISSION COMMENTARY 7/31/71 442 CST 116:07 GET 318/2

CAPCOM Dave, we're having to look at these based upon times. We don't see the contact light and we really don't know when touchdown occurred, but we're looking at things like the times, you were coming down at .7 there, all the way to the very end and then at the same that we see the pitch up and the roll over we seen an increase suddenly to 3.7. Over.

FALCON Oh, I see. Think we might have stuck our rear paw in a crater back there somewhere, huh?

CAPCOM What? Say again.

FALCON Looks like we might have stuck the rear pad in a crater back there somewhere, huh?

CAPCOM Either that or you touched down on something and fell though.

FALCON That's an interesting thought. Al says the landing radar is a pretty good data then.

FALCON Okay, Houston, Hadley Base here. We're ready to talk over the EVA plan with you if you'd like.

CAPCOM Roger, Dave. We're ready too. First of all we'll talk about the changes in the Travers plan, which are very minimal. But for your planning we're now showing a LM location on the grid map with coordinates of Bravo Romeo 3 and 75.5. Over.

FALCON Okay, Bob.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/31/71, 5:00 CDT, 116:26 GET, 319/1

FALCON Okay, Bob. We're going to have to
get in the ETB and pull the maps out. Just a second.

CAPCOM Roger. I'll wait then.

FALCON Bob, will you give me the coordinates
again?

CAPCOM Roger. Bravo Romeo 375.5. Over.

FALCON Roger. Copy. Bravo Romeo 375.5.

CAPCOM Roger. And that's over there near
November. Okay. That's to write down. The rest of this
for a while anyway is kind of just visory. This new location
has approximately 0.6 kilometers to the EVA-1 traverse and
therefore about six minutes driving time. However, that's
only provisional of course, and our indications of a beauti-
ful flat plain out there may mean that we'll make up some
of that time just in being able to drive faster than we were
perhaps anticipating. If this is not the case - -

FALCON There you have it.

CAPCOM Go ahead.

FALCON Before you get too far into that
broad flat plain out there hope we made it clear that there
is a fairly good population of craters which we're going to
probably have to drive around. Even though there are no
boulders we're still going to have somewhat of a wander factor
in avoiding the 3 to 4 meter craters.

CAPCOM Okay. We realize that Dave and in
order to keep the EVA total time to the maximum of 7 hours
this 6 minutes of it has already been deleted from the ac-
tivities of the LM at the end of the traverse. So that's
where we've taken up the slack at the present time. And
beyond that no further changes have met the EVA-1 timeline.
Over.

FALCON Okay. Very good.

CAPCOM Okay. Extra activities we'd like
you to include. We'd like a big glass ball that you saw
in the vicinity of the LM could be picked up hopefully with
a contingency sample if it's convenient. If not it should
be retrieved as part of the LRV preparation before the EVA
traverse. The geology people for obvious reasons are rather
interested in the large black rocks you described on the
SEVA at 40 meters and 300 meters and we'd like to pick
those up before you leave sometime. And I guess a little
note here which sounds like motherhood to me collected
samples should be taken at the crew's convenience at the
end of the EVA. As far as the Rover is concerned in our
new position - -

FALCON Okay.

FALCON Bob, give us a couple of minutes here
for each of those comments so we can come back at you.

CAPCOM Roger. Waiting.

APOLLO 15 MISSION COMMENTARY, 7/31/71, 5:00 CDT, 116:26 GET, 319/2

FALCON Okay. We were just discussing the frags around the LM and we can see a number of interesting rocks out here and we thought it might be better to wait until we get back to the LM to pick them up and make sure we didn't disturb the surface around it although we can pick them up fairly quickly in the beginning. I guess it's your choice if you want to spend the time in the beginning or wait until we get back.

CAPCOM Roger, Dave. My first flip comment there was a comment before you leave the moon. The second comment on the selected samples should be taken at the crew's convenience at the end of the EVA was apparently intended by the geologists to mean selected samples of these black rocks and other interesting frags. Over.

FALCON Okay. Well, do you specifically want us to pick up the glass ball and the black rocks before we start the EVA-1?

CAPCOM Stand by Dave.

CAPCOM Okay, Dave. You will put the glass ball at a higher priority apparently because they're worried if the glass ball might get lost once the area gets mused up a little bit whereas the black rocks will probably still be there. Over.

FALCON Okay. Understand. And I guess our understanding of the contingency sample is that it's supposed to be typical of the surface around rather than an exotic.

CAPCOM I guess that's basically true. I guess that's basically true, Dave. However, they would like this little glass ball. You could also put it separately in a bag before you leave with the Rover or I guess they really wouldn't mind if they know particularly what it is, if it was part of the sample - contingency sample.

END OF TAPE

FALCON Okay. We'll take care of that.

CAPCOM Okay. Let me talk to you about rover's status. The additional distance is 0.6 will - and your new position will not affect the electrical power profile. It's really a very small and almost trivial distance and secondly the LM slope the 9 degrees by 9 degrees is within the angles to which the deployment is specified which is 15 degrees and also within the angles for which it's been tested and I guess a couple of days ago they did test 15 degrees of pitch and 5 degrees of roll at Marshall and 14 degrees of pitch and 14 degrees of roll. And right now we will in real-time have the - mockup at Marshall positioned corresponding to our pitch up of 9 and roll of 6 degrees. Over.

FALCON Okay. That's nice to hear and sounds like those fellows are planning ahead as usual.

CAPCOM Hope so. And as far as checklist changes, we have none, as far as TV plan updates, we have none.

FALCON Okay. Understand.

CAPCOM And sometime, Dave, the medics would like a status report. postsleep.

FALCON Okay. Standby.

CAPCOM And when you're ready, Falcon, we've got some consumables for you.

FALCON Okay. For the crew status, I guess we both got about 5 hours sleep, based on the time we went to bed and the time we got up. No medication and we're in good shape. And I guess you can go ahead with the consumables.

CAPCOM Roger. And how about a PDR or PRD or whatever they are, readout.

FALCON Okay. I'll tell you what would help us out if we could do that once a day you know. They're stowed down in the chute pocket and we got to do some digging to get them. We'll give them to you twice a day if you really need it but it takes a little time.

CAPCOM Roger, Dave. I think they're only called out for once a day, we agree, and somehow I guess transearch - translunar we got in the habit of getting them from you at the time when we really didn't need them, like at sleep. We got them from you at sleep last night, it's just that the checklist called them out for right now but you're right it is only a requirement once a day and we did get them last night.

FALCON Okay. How are our crew status reports as of in the evening before bed. Do you want them then or do you want them in the morning?

CAPCOM Say again, Dave. When does your crew status report have them?

FALCON Prior to the rest period.

CAPCOM Okay, the flight plan shows it in the postsleep.

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 116:33 CDT 5:07 320/2

CAPCOM We'd like one this morning.
FALCON Well, make a decision.
CAPCOM Rog. We'd like one this morning before the
EVA and the surgeons promise they'll look at it today.
FALCON That's encouraging.
FALCON Okay, Bob, I'm ready to copy those consumables.
CAPCOM Okay, this is for GET of 116:40, RCS A 85, B 85.
O2 descent 1 78.5, tank 2 78. O2 ascent 1 99, tank 2 99.
H2O descent 1 58, tank 2 58. H2O ascent 1 100 percent,
tank 2 100 percent. Descent amp hours 1538, ascent amp
hours 572. Over.
FALCON Okay, I copy, Bob.

END OF TAPE

FALCON Bob, I've been looking at the descent water. It looks like we're off about 12 percent. Is that any concern down there?

CAPCOM Roger, Jim. We didn't just suddenly lose that. That was telemetered understanding of how we wanted the consumables updated. We're having a discussion about that right now. That was meant to be what your reading on board should be. I guess, saying that, if you're reading 58 percent, you're in good shape. Whereas, there's a separate figure, which is a figure down here, which I guess is something like the 70 percent that I gave you a few minutes ago. That seems to be,-

FALCON Okay, (garble).

CAPCOM That seems to be a question of how TELMU interprets what the consumables update should be. We may change that around and let you know later.

FALCON Roger, we copy.

CAPCOM Okay, Hadley, this is Houston. The actual onboard figures, not the gauge figures that you'll read, but the actual onboard figures for water are, descent 170.7 and tank 2 68.5. Over.

FALCON Roger, copy that. Thank you.

FALCON Houston, Hadley Base.

CAPCOM Falcon, this is Houston. Over.

FALCON Morning Joe. We're about due to take the computer up for a little while, and if you're ready we'll bring it out of it's sleep period for a minute, and then put it back to sleep, if you want to take a look at it.

CAPCOM Roger Dave, that sounds good to us. We'll be watching.

FALCON Okay.

FALCON Okay, Houston. Looks like it's still with us.

CAPCOM Roger, Dave. That's good news.

FALCON Houston, Hadley Base.

CAPCOM Go ahead Hadley, this is Houston.

FALCON Okay. As we get started on the suiting here, I want to make sure the Bio Med data was coming through plain to you, so we don't have any problems (garble).

CAPCOM Falcon, Houston. Apparently Jim's data is not very clean and we're not getting your data at all Dave. Other than that, it looks beautiful.

FALCON Well, I guess I don't mean right now, because you shouldn't be getting any data right now. What I mean, are the signals exceptable for computation of PLSS data or perhaps if they're not, you can give us a suggestion so, before we get going here we're sure that you've got good data.

CAPCOM Stand by.

FALCON As a matter of fact, while the good surgeons are thinking that one out, we're going,- Jim's going to plug in through the suit now, and you can check

APOLLO 15, MISSION COMMENTARY, 7/31/71, CDT 5:12, GET 116:32, 321/2

FALCON it out.

CAPCOM Roger, Dave. That sounds good, and we'll
be watching.

FALCON Okay, you should be receiving it and
we'd appreciate a call as soon as you can verify it's
good.

CAPCOM Dave, it looks real good to us.

FALCON Okay, thank you and I'll let you take
a look at mine as soon as I get to the suit part.

CAPCOM Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/31/71, 6:14 CDT, 117:40 GET, 322/1

CAPCOM Jim, this is Houston. Verify for us please that your biomed data is unplugged now.

FALCON Well, he's off the headset, Joe, but yes, it's unplugged. We're getting him into the suit.

CAPCOM Roger. Thank you.

FALCON What we'll do is get all hooked up to the suit and then let you check it out and then climb into the suit just to make sure.

CAPCOM Sounds good, Dave. We'll be standing by.

FALCON Joe, how do you read. I'm back on comm.

CAPCOM Roger, Jim. Loud and clear.

FALCON You're the same.

FALCON And Joe, looking at a battery management change at about 118:05, should we do it on that time?

CAPCOM Stand by, Jim. I'll be right back with you.

CAPCOM Falcon, regarding your question on battery management, we would like you to do it per the checklist on the time listed there, please.

FALCON We understand.

PAO This is Apollo Control at 117 hours 57 minutes ground elapsed time. Preparations now underway aboard Falcon for the first extravehicular activity. The crew presently is donning pressure suits after having attached the biomedical sensors. Telemetry coming back from the Falcon shows at this moment mean heart rate for the lunar module pilot Irwin of 79 and for Commander Dave Scott around 60. Cabin pressure onboard Falcon now showing 5.2 pounds per square inch. Meanwhile back in Mission Control Center the Gold Team of flight controllers taking over for the next 8 or 9 hour period for the EVA-1. And acquisition of signal through the command service module almost 4 minutes ago. Flight director Gene Kranz and his team of orbital science specialists are working with Worden on the orbital science experiments underway on a separate loop. The air to ground between the second capcom and Worden will be transcribed in the News Room. However, will be not - will not be carried on the air to ground. At 117 hours 59 minutes up live with the communications with the lunar module Falcon at Hadley Rille this is Apollo Control.

FALCON All right, Houston. This is Hadley Base. Did you check the commander's biomed?

CAPCOM Roger, Jim. Dave's EKG data looks clean as a whistle.

FALCON Very good. He's going to complete the suiting up.

CAPCOM Roger.

APOLLO 15 MISSION COMMENTARY, 7/31/71, 6:14 CDT, 117:40 GET, 322/2

FALCON And I'll get to the battery shortly.
CAPCOM Roger.
FALCON Okay, Joe. I'm going to press on
with the battery management now.
CAPCOM Roger, Jim.
FALCON And both ED batteries check at 37.
CAPCOM Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 118:10 CDT 6:44 323/1

FALCON Okay, battery management complete.
CAPCOM Roger, Jim. Thank you.
FALCON Hello, Houston. Hadley Base.
CAPCOM Hello Hadley, this is Houston.
FALCON Okay, we're down to the point of PLSS donning
and with our Mission Timer turned off here to save the power.
How about giving us a hack on when we depress relative to
the time now so we can keep track.
CAPCOM Roger, Dave. We're starting the clock right
now.
FALCON Yes, but give us a hack on the time which we
should depress relative to your time there in Houston.
CAPCOM Roger, Dave. Understand, and we'll be right
back with you.
FALCON Okay, we're looking at about 10 minutes after
7:00 right now.
CAPCOM Hadley Base, this is Houston.
FALCON Go ahead, Houston.
CAPCOM Roger, Dave. We're looking toward a cabin
depress at about 8:00 o'clock Houston time.
FALCON Okay, fine. Thank you.
CAPCOM And Dave and Jim, there's nothing magic about
that number. That's just our first calculation. Any time
around there would be beautiful.
FALCON Okay, well that's all we wanted just to have
a rough cut on it.
PAO This is Apollo Control at 118 hours 45 minutes
ground elapsed time. During the last exchange between the
spacecraft communicator Joe Allen and Falcon at Hadley Base,
there were some arrangements made as to when the crew would
be given a GO NO-GO for depressurizing the Lunar Module,
and it seems the crew is operating on Central Daylight Time.
The GO NO-GO will be given at about 8:00 A.M. Central Daylight
Time, approximately 40 minutes from now, and depressurization
will follow shortly thereafter. It'll be a slow bleed down
to zero. At the present time, the Lunar Module pressure is
5.1 pounds per square inch. We're still 21 minutes away
from loss of signal with the Command Module, Endeavour,
presently conducting Orbital Science Experiments. Continuing
to stay up live on Air-Ground with Falcon, and at 118 hours
47 minutes ground elapsed time this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/31/71/, 7:36cdt, 119:02get, 324/1

FALCON Okay, Houston, Hadley base. We're about ready to go into a miscon check, if you're ready.

CAPCOM Roger, Dave. We read you about 3 by. Stand by till I get a go ahead from INCO here.

FALCON Okay.

CAPCOM Okay, Dave. We're go on the FM and high tower. We've got it down here.

FALCON Okay. We'll be talking to you.

IRWIN Ox, (garble) VHF (garble) burn, meter recede.

SCOTT Okay, CB6 comm, SE audio OPEN as used next to the -

IRWIN Miscon. A CB16 comm SE audio close, SPT maintain right, verify. A PLSS mode A wheel counter-clockwise.

IRWIN (garble) A. Yeah wheel is full counterclockwise.

SCOTT Okay. Turn on vent flag P, press flag 02 momentary.

IRWIN Okay, they're on.

SCOTT Okay. Press 02 pressure gage gainer an 85.

IRWIN Verified.

SCOTT Okay, you've made your comm check with me (garble).

IRWIN Houston, How do you read the LMP?

CAPCOM Jim, you're loud and clear. There's a squeal in the background

IRWIN Roger. I have that squeal, also.

CAPCOM Jim, Stand by, we'll

IRWIN I'll turn the (garble) down a little bit in a few minutes.

CAPCOM Roger, and Jim, stand by. We're thinking about that tone a minute, here; about the squeal in the background.

IRWIN Okay, I'm standing by.

CAPCOM Jim, this is Houston. Could you turn your volume down a little bit for us please? And that's volume on the wheel.

IRWIN Okay, the volume's down now. Okay, I've got it down about three quarters of the way. How do you read now.

CAPCOM Jim, that's beautiful. The squeal's gone and you're 5 by. And we're ready to go to the next step.

IRWIN Okay, go ahead.

CAPCOM Rog. We're ready to go to the next step.

SCOTT Okay. PB11 comm, CDR audio OPEN.

SCOTT Okay. I have the tone on vent bag P and pressure flag 0. 02 pressure gage is reading about 94 percent and how do you read me Jim?

IRWIN I read you loud and clear.

SCOTT Okay, you did make a comm check with Houston, then?

APOLLO 15 MISSION COMMENTARY, 7/31/71, 7:36cdt, 119:02get, 324/2

IRWIN Houston, how do you read the LMP?
CAPCOM Jim, you're 5 by.
CAPCOM And Dave, you're 5 by. Sounds beautiful.
IRWIN You're the same.
SCOTT (garble) when he can't me.
IRWIN Understand.
SCOTT Okay, PLSS mode LMP to - now you won't be
able to hear Houston.
IRWIN Check.
SCOTT PLSS LMP to B and CDR to A.
IRWIN (garble) B.
SCOTT Okay. I'm in A, how do you read?
IRWIN I read you loud and clear Dave.
SCOTT Okay, I read you loud and clear. Houston,
how do you read the CDR?
CAPCOM Dave, you're 5 by, and Jim's 5 by.
SCOTT Okay, PLSS - -
SCOTT PLSS mode both to AR, tone ON.
IRWIN AM AR.
SCOTT Okay, I'm AR and you're loud and clear to
me. How me to you?
IRWIN Same.
SCOTT Okay, Houston. How do you read the CDR?
CAPCOM Dave, you're loud and clear.
SCOTT Okay, we need a TM check with you, and
the 02 quantity in the CDR is 94, and give them yours Jim.
IRWIN Jim reading about 92.
CAPCOM Roger. We copy.
CAPCOM And, Falcon the data looks good. We have
the CM check.
SCOTT Okay (garble) pump closed.
SCOTT Okay. I understand. A good TM check. Good.
IRWIN Okay. LPG pump on close, now.
SCOTT Okay. I hear the pump.
SCOTT Okay, LPG cold is required. I feel it
already. It feels good.
IRWIN Yeah. It sure does, doesn't it.
SCOTT Okay. CB16 ECS cabin repress close verify.
IRWIN Verified.
SCOTT Two pan Delta P open.
IRWIN Open.
SCOTT Two pan 2 open.
IRWIN Open.
SCOTT Two pan select number 2, and I'll get that.
ECS caution H2O subcomponent lights on.
SCOTT Okay.
IRWIN I've got a press flag 0 and a mid flag T.
SCOTT Same here.
IRWIN Okay. That's good.
SCOTT Okay, ECS caution lights are out. Okay
suit gas diverter pro - egress verify.

APOLLO 15 MISSION COMMENTARY, 7/31/71, 7:36cdt, 119:02get, 324/3

IRWIN That's all verified.
SCOTT Okay. Cabin gas return to egress verify.
IRWIN That is verified.
SCOTT Suit circuit relief auto verify.
IRWIN That's verified.
SCOTT AOBS connect. Suit isolation to suit
disconnect. And disconnect the LM 02 hoses and secure about
the PGA.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/31/71 GET11915 CDT749 325/1

FALCON suit isolation to suit disconnect and disconnect the LM O2 hoses and secure about the PGA. GARBLE time up standby we've got a master arm, here it is. I think it was just a second one on the fan. Yes he is. GARBLE.
Water SEP.

FALCON GARBLE.

FALCON That's okay. It's a water ACCEPT (garble)

IRWIN Yeah, read those next steps Dave I didn't one at a time.

SCOTT Yeah, okay. Connect the OPS O2 hose to PGA blue to blue.

IRWIN Okay, OMNI. High bit.

IRWIN I might have been turned around. Let you do that.

SCOTT Yeah.

SCOTT I did it, there.

IRWIN In fact, hey why don't you turn around.

SCOTT Yeah.

SCOTT Hey that's pretty good cooling isn't it.

Beautiful.

SCOTT You had enough.

IRWIN My turn to step up. We'll need it, we've got to cool down as much as we can.

SCOTT Yes GARBLE.

IRWIN Am I hooked.

SCOTT Yeah, you are hooked on the handle for the PLSS.

IRWIN Did you get down a little bit? Okay. See if we can put that - GARBLE out.

SCOTT Yeah.

IRWIN You had hooked the PLSS harness (garble).

SCOTT Okay, go through it here. I'll just hook you S02. (garble)

IRWIN Yes, I've got it. Okay, Houston disconnect.

SCOTT B is locked and lock locked.

IRWIN Okay we take the O2 hoses off. Be sure about the PGA. Look there.

SCOTT Okay, connect OPS. They already did that, retrieve the purge valve.

IRWIN Okay. GARBLE closed and in low position.

SCOTT It is? Okay, purge valve NPG red to red. Mine looks about right.

IRWIN Yeah, looks okay. Okay, purge valve is in lock lock.

SCOTT Okay. GARBLE valve on vertical. Will you repeat the OPS connect.

SCOTT Okay. suit isolation go to suit disconnect.

IRWIN Okay, suit iso.

SCOTT That's correct.

IRWIN I'll disconnect your O2's. Okay and what's the (garble) about the PGA here.

APOLLO 15 MISSION COMMENTARY, 7/31/71 GET11915 CDT749 325/2

IRWIN Okay, I'll connect the OPS
O2 hose. Okay GARBLE.
SCOTT Connect it at lock. Okay, retrieve the purge valve.
Verify close. Lock fan in on low. Okay it's roll locked in there,
now it is closed. Okay it's in.
SCOTT Okay.
IRWIN GARBLE.
SCOTT And it's locked.
SCOTT There. That PGA to GARBLE valve vertical.
IRWIN Vertical. Okay, take a drink.
SCOTT Take a drink and I think I've had about enough
BLTG huh? Now let's -
IRWIN Yeah, let me get it. That thing is (garble) up.
I don't know why they have that little hook GARBLE.
SCOTT Here you go.
IRWIN Yeah.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET11920 CDT0754 326/1

IRWIN Okay, I'll get it. Okay, it's stowed.
SCOTT Okay, descent water valve closed.
IRWIN Okay, ready for helmet and glove donning.
SCOTT Okay.
IRWIN Position mikes. Yea, I think we've got
them today.
SCOTT Okay, PLSS fan on.
IRWIN Okay, PLSS fan to on.
SCOTT (garble) to off.
IRWIN Flag close. (garble)
SCOTT Okay Rog clear.
IRWIN (garble) Helmets with levers. Check drink bag
position .
SCOTT Okay, Irwin, how does that look.
IRWIN You'll be able to get to it.
SCOTT Okay.
IRWIN Get the drink valves here. And lunch.
Okay.
IRWIN Do I line it up.
SCOTT Yea, you line it up.
IRWIN The lines not quite there.
SCOTT Okay.
IRWIN And the film. Click and lock.
Get your flaps back here. Scott, I've got a high frequency tone
on the comm, do you?
IRWIN I have a, I guess I do, way way back in
the background.
SCOTT Yea.
IRWIN Yea, pretty low.
IRWIN Okay, you are all buttoned up. Okay.
IRWIN Let's get your strap.
SCOTT Strap here.
IRWIN Okay. 1, there's 2 okay, here's 3
SCOTT That gets yours.
IRWIN I'll line it up for you. Hold it there
let me get your, okay, keep down the dial, I'll push this in.
SCOTT Check.
IRWIN Okay, your clear in the suit. Okay,
it's lined up if you can get me down all the way.
SCOTT Okay, it's locked.
IRWIN Okay. Sleeve is not locked though.
SCOTT Okay. I'll have to rotate your helmet
after I get the lever locked.
IRWIN Okay.
SCOTT Still lined up?
IRWIN Yea, it's okay. Rear flap first.
Okay.
SCOTT Okay, let me get your straps with the
2 on it.
IRWIN Here.

APOLLO 15 MISSION COMMENTARY 7/31/71 GET11920 CDT0754 326/2

SCOTT Right one. Now my left one.
IRWIN Okay. LCG cold is required.
SCOTT It sure is.
IRWIN Okay, I'll go around and -
SCOTT Okay.
IRWIN Grab it.
IRWIN Okay LCG pump coming open.
SCOTT Okay.
IRWIN Okay.
SCOTT Okay, next. Give me 16 ECS LCG pump
is open and disconnect the LM water hose and connect the
PLSS water hose.
IRWIN Okay, in work.
IRWIN Okay, mines connected, Dave.
SCOTT Okay, mines connected.
IRWIN Okay. Stow LM hoses.
SCOTT That's in work.
IRWIN Okay, I'll put mine up here on the
hand hook. Out of your away. (garble) looks good.
IRWIN Okay, mine are stowed.
SCOTT Okay. Okay, mine are stowed.
IRWIN Stand by to (garble).
SCOTT Okay.
IRWIN Don't turn around.
SCOTT Okay.

END OF TAPE

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IRWIN Where do we get the (garble) from, I wonder.
SCOTT (garble)
IRWIN Oh, yes. Just straight in the cabin, that's
right. Okay, helmet and visor alined and adjusted. (garble)
SCOTT Verified.
IRWIN Okay, O2 connectors, 3 of them locked.
SCOTT Okay, and I'll put your booties on.
IRWIN Yes.
SCOTT Okay, they're all 3 locked.
IRWIN Okay, and purge valves - 1 locked.
SCOTT Locked.
IRWIN H2O connector locked.
SCOTT It's locked
IRWIN Comm connector locked.
SCOTT Locked.
IRWIN PGA diverter valve to vertical.
SCOTT Vertical.
IRWIN Okay, you read to me.
SCOTT Okay, helmet and visor alined and adjusted.
IRWIN Okay, verified.
SCOTT O2 connectors - 3 locked.
IRWIN Okay.
IRWIN 1 2 (garble) 3 and the (garble) down.
SCOTT Okay, purge valves - 1 locked.
IRWIN Purge valves closed and locked
SCOTT Water connectors - 1 locked.
IRWIN Locked.
SCOTT Comm connectors -
IRWIN On and locked.
SCOTT PGA diverter valve vertical.
IRWIN Diverter valve is vertical.
IRWIN Okay, verify EVA's circuit breaker configuration.
SCOTT Okay.
IRWIN Mine are verified.
SCOTT Stand by, I'll check mine.
IRWIN Yes.
SCOTT Okay, mine are verified.
IRWIN Okay, donn EVA gloves - and (garble)
PAO This is Apollo Control. Scott and Irwin now
going through their suit pressure checks.
SCOTT Yes, yes (garble)
IRWIN Okay (garble)
IRWIN Don't (garble) for just a second.
SCOTT Okay.
IRWIN You'll have to turn around and give me a
hand here.
SCOTT Okay.
IRWIN Just hold the glove.

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SCOTT It's not in the engage position.
IRWIN Yes, I know but - okay, thank you.
SCOTT Let me do it.
IRWIN Just a minute.
IRWIN Okay, push. Okay.
SCOTT Okay, verify mine, I'll verify yours.
IRWIN Okay, locked, locked.
SCOTT (garble) locked.
IRWIN Okay.
IRWIN They were tough.
SCOTT Good work.
irwin (garble)
SCOTT Okay, the GA body plss 02 ON-OFF. PLSS con-
verter valve to main verified.
IRWIN Verified.
SCOTT (garble) verified.
IRWIN Mine's verified.
IRWIN PLSS pump to on rate.
SCOTT Okay, my pumps going on now.
IRWIN So's mine.
SCOTT Pumps A & B to egress.
IRWIN A & B to egress.
IRWIN Now we'll run through the pressure integrity
check. Okay, PLSS 02 to ON.
SCOTT 02 to ON.
IRWIN My pressures coming up.
SCOTT Okay, my 02 is ON.
IRWIN Okay.
SCOTT Okay, my pressure is coming up.
IRWIN Okay.
IRWIN My pressure is on the peg.
SCOTT Oh, about 3.2.
SCOTT Okay, I'm stablized to about 3.8 and the 02
flag is clear.
IRWIN Now we got to do that tricky little manuever
with the - PLSS 02.
IRWIN Okay, coming off now.
SCOTT Okay, mines off.
IRWIN Okay, mines off.
SCOTT Mark a minute, Houston.
CAPCOM Roger.
IRWIN You can really tell the pumps running, can't
you?
SCOTT Yes.
IRWIN Sounds like an airplane (garble)
SCOTT There you go.
IRWIN It should be a minute, Dave, right there.
SCOTT Did they give us a mark?
CAPCOM That's good.

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 119:26 CDT 8:00 327/3

SCOTT Okay, it's a minute I'm reading 37.
IRWIN Dave, PLSS 02 - ON.
SCOTT 02 coming on.
IRWIN Okay - I got a tone and verify the 02 flag is clear.
SCOTT Okay, Houston. I guess here at Hadley Base, we're standing by for a GO for the DEPRESS.
CAPCOM Roger, Falcon. You're GO for DEPRESS. Lets take a look at Hadley.
SCOTT Good show. Okay, Jim. Are you ready with the circuit breakers?
IRWIN Yes. CB 16 ECS cabin repress OPEN.
SCOTT Cabin repress. Open.
SCOTT CB 16 - COMM - TV closed.
IRWIN COMM - TV closed.
SCOTT Okay, cabin repress valve to CLOSED.
IRWIN Cabin repress closed.
SCOTT Okay, and you can come around to the dump valve.
IRWIN Okay.
IRWIN Okay, I got a tone.
SCOTT So do I.
IRWIN Yes.
SCOTT Can you get around alright?
IRWIN Yes.
SCOTT Maybe I can get out of your way, a little bit.
IRWIN Oh, is that's what's blocking me?

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/31/71 GET11937 CDT0811 328/1

IRWIN)garble)
IRWIN Can you get out alright?
SCOTT Yeah, maybe I can get out of your way a little
bit.
IRWIN Oh, is that what's blocking me?
SCOTT Yeah, move back in the corner.
IRWIN Okay, let me get turned around here a little
bit. Okay, now I'm a little bit more out of the way for you.
SCOTT Okay, I'm ready to go down.
IRWIN Okay.
IRWIN Open the dump valve.
SCOTT Okay, let me get a hold of the cabin pressure
here.
IRWIN Okay.
SCOTT Open and then AUTO at 3-1/2, okay?
IRWIN Okay. Open.
SCOTT Okay, we're down to 4-1/2, 4 Mark 3.5.
IRWIN I got it.
SCOTT Okay, verify GARBLE gage has not dropped
below 46. I'm looking at 51.
IRWIN Okay, same here.
SCOTT Rog. Okay, verify cabin at 3.5 and it is at 3.5
LM suit circuit lockup at 4.3 and it's about 4.5 and PGA grater
at 46 and decaying. And it's a verify on mine. And let's see about
the clocks here.
IRWIN It's - set it.
SCOTT Okay overhead of forward dump valve to open.
IRWIN Okay, I'm going open.
SCOTT Okay. Verify GARBLE water flag A at about
12 to 17. Okay we're down to 25, 20. Check and see conden-
sation in here. Say you can.
IRWIN Yeah, a little fog.
SCOTT Okay 15.
IRWIN Okay I've got a water dump.
SCOTT Okay. And I have a water and a tow. Readout
at 1.0. Okay, when it gets all the way down I'll partially
open the forward hatch so you can come back up.
IRWIN Okay, just leave the dump valve in open.
SCOTT If you could slide back over to the right a tad
there.
IRWIN The (garble) bay sure fills up a (garble) duct right
there, old buddy.
SCOTT Yeah, I've got to swing around so I can get
your antenna. That way you can move over to the left,
I want to swing around to the left.
SCOTT Okay, let me get the jettison bag out of the way.
IRWIN What's your biggest GARBLE. Okay, hold on.
SCOTT Better get the cabin down, so I can open
partial here.

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IRWIN Get down there okay?
SCOTT Yeah, okay it's open.
CAPCOM Roger, Dave and we've got that mark.
SCOTT GARBLE moisture GARBLE. It's snowing ice crystals
out the front hatch. It's really beautiful. You should see
the trajectory on them. I can't keep it open. Too much pressure.
CAPCOM I bet they are flat aren't they, Jim, the
trajectories.
SCOTT It won't open, Jim. Move it over there.
SCOTT Very flat, Joe.
SCOTT Move back over to where you were.
IRWIN Let me get back in my corner here.
SCOTT Yeah, you really have to. Turn around here.
IRWIN Let me turn around to the right.
SCOTT Can't keep it open. There. Okay. Boost leg
up.
IRWIN Can you hold it open?
SCOTT Yeah, I got it open.
IRWIN GARBLE. I feel like I'm caught on something.
Garble velcro straps on the floor.
SCOTT Ooch, my back.
IRWIN Okay I can't tell.
SCOTT Okay. PLSS primary water open. Did you do
that?
IRWIN Yeah. GARBLE get around to it.
SCOTT Yeah, I'm going to have to move it. You look
around it.
IRWIN Would you please turn around here. See what
might be GARBLE. I'm hung up on something.
SCOTT Garble.
IRWIN Yeah.
SCOTT No wonder, Jim.
IRWIN Okay, I can swing around now, let me check you.
SCOTT See anything hung?
IRWIN (garble) Okay.

END OF TAPE

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SCOTT Is there anything to it?
IRWIN (garble). That strap - the hoses were - Let me
adjust that strap.
SCOTT Okay. Your right side. It was hung on the hoses.
IRWIN Stand by.
SCOTT Okay.
IRWIN Did you get your water on?
SCOTT No, never got it. Let me get it now.
SCOTT (garble).
IRWIN (garble).
SCOTT One thing we never did was to tie this jettison bag
up.
SCOTT Did I?
IRWIN (garble).
SCOTT Yeah.
IRWIN Is it on?
SCOTT Yeah, it's on. The only question is whether
it's on completely all the way. I think it is.
SCOTT I'll know as soon as the cooling comes in.
IRWIN If i could get this jettison bag out of the way.
SCOTT That test is over. Put this on the engine,
over?
IRWIN I'll try.
SCOTT Get it?
CAPCOM Jim, this is Houston. Your water looks good
to us.
IRWIN Let me just hold it.
IRWIN Okay, and thank you, Joe.
CAPCOM I'll just hold here, Dave, until you've moved
out.
SCOTT Okay.
SCOTT Before you get out, let me get that -- your
antenna.
IRWIN Yeah. But you can get that as I get to the
door.
SCOTT Yeah.
IRWIN I can start-position here.
IRWIN There.
SCOTT We missed that.
IRWIN Put on a mid step.
SCOTT Jim, my water flag is clear.
IRWIN It's cooling.
IRWIN Then cool it. And my water go to intermediate.
SCOTT Go to intermediate?
IRWIN Yeah. (garble) this (garble).
CAPCOM Dave, it should clear in a minute.
SCOTT It just went -
SCOTT I just looked at it.

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SCOTT Must take the right pair of eyes.
IRWIN See what is next on the agenda here?
SCOTT Okay (garble) lights on.
IRWIN RAD visor okay.
IRWIN I'm beginning to get a little bit now.
SCOTT Get your visor?
IRWIN Negative.
IRWIN Thought I'd do it - down in the door so I don't
scratch it, okay?
SCOTT Right in here.

END OF TAPE

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IRWIN (garble) here.
SCOTT Hey Houston, by the way. You got TV picture down there.
CAPCOM Not yet Dave. We're working on it.
SCOTT Say again.
CAPCOM Dave, this is Houston. Is the MESA
deployed?
SCOTT It might have something to do with
it huh Joe.
IRWIN (garble)
SCOTT Okay, I'm ready.
IRWIN Okay.
SCOTT Hey, can you move back a tad.
IRWIN Yeah.
SCOTT Here we go.
CAPCOM Dave, this is Houston. Jim's feed
water pressure is a little high. We wonder if you can, are
in a position that, to see water coming from his sublimator.
Over.
SCOTT I'll sure not Joe. Not really.
IRWIN Let's check it out when we get out,
Joe.
CAPCOM Roger.
IRWIN Okay, down a little further Dave.
SCOTT Yea.
IRWIN The PLSS is hitting the DSKY desk.
SCOTT Yea, I know it was caught on the jettison
bag. Hows that?
IRWIN Your clear on it now. Over a little
to your left. Down a little more a little to your left.
SCOTT Okay, hows that?
IRWIN Good. Okay, let me get the antenna.
Hold right there. Okay, your antenna's deployed.
SCOTT Okay.
SCOTT Ease out here.
SCOTT Okay. Okay, let's try the MESA.
Down it comes. MESA's down.
IRWIN Okay Dave. I'm going to put the jet bag
in the hatch.
SCOTT Okay.
IRWIN Okay Dave. I'm going to put the jet bag
in the hatch.
SCOTT Okay.
CAPCOM Okay, and Dave and superb television
picture down here.
SCOTT Oh, that's encouraging.
IRWIN Here's a jett bag, Dave.
SCOTT I've got it.
IRWIN And I'll pass you the LEC.
SCOTT Okay.

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IRWIN Let's see, I certainly don't want
to hit that neat little round rock down there.
SCOTT And my jett bag's gotten pretty dirty.
CAPCOM Jim, Houston. Requesting intermediate
cooling.
IRWIN Stand by Joe.
SCOTT Get it okay, Jim?
IRWIN Now this should be your (garble)
SCOTT Say again. Yea.
IRWIN Okay. Let's see here. (garble) up a string.
SCOTT You tied it too tight.
IRWIN Oh yeah. Okay.
SCOTT Okay.
IRWIN Going down, on the rover's side.
Okay, it's down.
SCOTT Okay.
IRWIN Ease on down the ladder here.
CAPCOM Dave, an extraordinary television
picture here.
SCOTT Okay. Okay, Houston. As I stand out
here the wonders of the unknown at Hadley. I sort of realize there's
a fundamental truth to our nature. Man must explore. And
this is exploration at its greatest. Well, I see why we are
in a tilt. We've got, that's very interesting. There's
so much hummocky ground around here, we're on a slope of
probably about 10 degrees, and the left rear foot pad is
probably 2 feet lower than the right rear foot pad, and the
left front is a little low too. But the LM looks like it's
in good shape. The rover's in good shape. Tell the program
manager that I guess I've got his engine bell. It's a little
rise right under the center of the LM. The rear legs in a
crater and the rim of the crater is right under the engine
bell.
CAPCOM Roger, Dave. Jim got the message.
SCOTT Okay. Sorry about that Jim, but IFR
landing you know. Okay. ETB. Jim you can transfer the ETB.
I think you'll find the stability is pretty good.
IRWIN Okay.
IRWIN Stand by Dave a minute.
SCOTT Okay. Give me a word anytime.
IRWIN Okay Dave, it's ready. Over the
rail here.
SCOTT Alrighty. Down she comes.
SCOTT Rather interesting sight Houston.
I can look straight up and see our good earth back there.
CAPCOM Roger.
SCOTT Okay ETB is on the ladder hook and we'll
pick the old MESA up here.
CAPCOM Roger Dave, and Jim the deverter valve
is yours, what ever -

END OF TAPE

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CAPCOM Roger, Dave. And Jim, the diverter valve is yours; whatever position you'd like. And did something else come out with the ETV.

IRWIN The wrapping on the package for the LEC.

CAPCOM Roger.

IRWIN Okay, Dave. I'm going to come on out.

SCOTT Come on out. It's nice.

SCOTT One of the interesting things, Jim, is the momentum you generate.

SCOTT You can get going. It's easy to get going - but you get all that momentum going there, why it takes a bit to stop.

IRWIN That looks like a feasible place for the MESA.

SCOTT (garble)

IRWIN I think maybe a little higher.

IRWIN Say, Dave, could you tell what I'm hung up on here.

SCOTT Okay, let me come over. Just a second. Stay right there.

SCOTT Yeah. Coming up to take a look. Stand by. Me come left, Jim.

IRWIN (garble)

SCOTT Yeah. Just back out, head down. You're coming. Ease out. That a boy. Okay, okay, you're clear.

IRWIN Okay. I'm closing the hatch.

SCOTT Oh, it - it's dirty.

SCOTT And, Jim, I'm going to put a big circle around this glass ball, so we don't mess it up. It's pretty neat.

IRWIN You want me to take it in the contingency sample?

SCOTT Yeah, wish we had it - -

IRWIN We ought to document it. Then we won't lose it.

IRWIN Boy that Front pad is really close, isn't it?

SCOTT Yeah.

IRWIN Okay, why don't you get my antenna.

SCOTT Get your visor, Jim. Let me get your antenna.

SCOTT Open this snap here. Get out of there little fellow. You antenna's up.

IRWIN Your boots are blacked over -

SCOTT So are yours.

IRWIN I'll get this glass ball here on the

SCOTT No, why don't you save it.

SCOTT Let's document it; it's okay with a circle around it

SCOTT Okay.

IRWIN Okay. I'm going to move out and get the

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IRWIN contingency sample.
CAPCOM Roger. Jim.
SCOTT How do the pictures look now Jim?
IRWIN Oh, boy, it's beautiful out here. Reminds
me of Sun Valley.
CAPCOM Roger, Jim.
IRWIN I believe you can get a - rock here
it's about 2 inches subrounded in the contingency sample
along with the soil.
CAPCOM Roger, Jim, we copy that and did Dave get
your EV visor down?
IRWIN Yes he did.
CAPCOM Outstanding.
IRWIN You might note for the next time around that
in addition to the BELLCRO and MESA blankets, we have all
the tape. It really makes it tough.
SCOTT If we need tape, I guess we ought to
learn how to do it with all the tape on there.
IRWIN Okay, I have the contingency sample. I'm
taking it back to the ladder.
CAPCOM Roger, Jim.
IRWIN No wonder we slipped Dave. Boy, that's
really soft dirt there around the front footpads.
SCOTT Sure it, isn't it?
IRWIN Like about 6 inches deep; of soft material.
CAPCOM That's also like Sun Valley, Jim.
IRWIN Yeah, powder. Dave, don't move back; I've
got the tripod over here.
SCOTT Okay.
CAPCOM That makes for easy trench digging.
IRWIN Always thinking, huh Joe?
CAPCOM Looking ahead.
SCOTT Okay, TV's coming off to go to the tripod.
IRWIN There it is; don't step on it.
SCOTT I won't.
SCOTT Let me get this out of your way, first,
Jim.
IRWIN Yeah.
IRWIN But look at that little glass ball
squirming around.
SCOTT Say, I'm going to do my (garble) up now.
IRWIN Yep.
IRWIN The crater here that I'm standing by, Joe,
it's about a meter in diameter and then there's a smaller
crater right in the center of it and that one has fragments
around it that have glass exposed on them, where the larger
crater does not have any glass exposed; it's the smaller
crater within the large one.
CAPCOM Roger, Jim. Copy. And careful with the
Sun, Dave.
SCOTT Yes sir.

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SCOTT But when I turn this thing back and play it at you at 12 o'clock, it's going to be looking right into the Sun, so you'd better think about that. As a matter of fact, I think a little discretion here might put it over about 10:30 or 11:00.

CAPCOM Roger, Dave. That sounds good.

SCOTT I'll tell you looking even that way, the sun angle, why, by golly, it's pretty bright. Joe, I'm going to swing the camera around towards the ground and now it's pointing back at the LM, but down. I want you to take a look as I move it up slowly to make sure that we're okay on what you see. Okay?

CAPCOM Dave, we read all of that. We're getting a beautiful picture now. We're going to try to wind up with the tripod in the shade, if that's possible, looking back towards the LM.

SCOTT Yeah that - that's possible. We'll do that.

CAPCOM Outstanding.

END OF TAPE

CAPCOM Outstanding.
SCOTT Managed to set it right in a crater. Okay,
Joe. Mag C is going on the 16 millimeter.
CAPCOM Mag CHARLIE.
SCOTT CHARLIE.
SCOTT Okay, Joe. That ought to do it for your TV
I hope.
CAPCOM Dave, We're happy. It looks good.
SCOTT Okay, you want - you like it like that or do you want me
to go to the settings in the checklist?
CAPCOM Stand by, Dave. Stand by.
SCOTT Okay.
IRWIN Dave, I have the camera all configured for
those pictures.
SCOTT Good. Okay Houston, I'll give you about 10
more seconds.
CAPCOM Roger, Dave. Very slightly more to the right
so we can watch the Rover come down. Looks good. Looks good.
SCOTT How's that?
SCOTT Okay, you want to leave those settings? They're
F8 instead of F11.
CAPCOM It's okay, Dave, beautiful.
SCOTT Okay.
IRWIN Okay.
CAPCOM It's okay, Dave.
SCOTT Okay.
SCOTT Okay, Jim. Let's take a look at our Rover
friend here. Watch that TV cable, man that's really a -
IRWIN I'm going to - let me see if I
can get it under the pad so I don't trip on it.
SCOTT Okay. Okay, the operators look okay. Okay,
IRWIN I'm going to go up the platform.
SCOTT Okay.
IRWIN Don't pull it yet.
SCOTT No.
SCOTT A ha, 1 walking hinge was loose. It's reset.
IRWIN How about this one over here Dave, did you
check it?
SCOTT I'm going to get it. Yes, it's loose too.
IRWIN Both walking hinges were open, Joe.
CAPCOM Roger, copy.
SCOTT And earmarked. (garble) looks generally
parallel. And - take a look at the pins. Contingency
samples on the platform, Joe.
CAPCOM Roger.
SCOTT How do the pins look up there, Jim, can you
see those.
IRWIN They look okay up here, Dave.
SCOTT Okay.
SCOTT Have to learn about those (garble) a surprise.
CAPCOM And Dave, LRV tool should come down with that
strap.

SCOTT Yes, I got it.
IRWIN Okay, I guess we - just lay it in there.
IRWIN I'll stick it right down here, in case we
need it.
SCOTT Okay, whenever you're ready.
IRWIN Get the right tape up, okay.
SCOTT Okay, Jim. Go ahead.
IRWIN Okay, here it comes.
IRWIN Released.
SCOTT It's released.
IRWIN Okay.
SCOTT Now, when you come down don't disturb our
little brass ball. The Rovers going to come down into a
slight tilt to the left. I think we'll be okay.
IRWIN I want to get the camera, too Dave.
SCOTT Yes.
IRWIN Taking this out. I'll just start. It takes
a while to unwind.
SCOTT Walking on all these slopes makes it sort
of sporty doesn't it?
IRWIN (garble)
SCOTT You're hooked up on the LEC, Jim.
IRWIN (garble) TV.
SCOTT Don't knock the TV over.
IRWIN In trouble.
IRWIN Did I move it or not?
SCOTT No, you didn't move it. It's okay I think.
TV still look okay to you, Joe.
CAPCOM TV's fine.
SCOTT You're on the TV, Jim.
IRWIN Yes, I see that.
SCOTT Go around. Let's go.
SCOTT You're on the TV with your left foot. Your
left foots on the TV. You're still on it Jim, don't keep
coming in - there you go now you're out.
IRWIN I've got to get around it. Look at that
circle right there.
SCOTT Too bad.
IRWIN Let me get around here.
SCOTT Ready.
IRWIN Here we go.
SCOTT Oh. Oh. Atta boy.
A little more, little more. Looks like you're going to have
to do the bulk of the work today. Keep it taut. Atta boy.
Okay, we're coming up here 45 up to about - easy Jim, easy.
Okay. Here, let me help you. Take it easy - take it easy.
Give me your hand. Okay, come on up. Up we go. Easy.
IRWIN Just pull it.

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SCOTT Just pull - just stand there easy, forget
the picture. Just pull very easy right there. Okay. Just
go easy now.

IRWIN Got it.

CAPCOM Pretty sporty there, Jim.

IRWIN Dave.

IRWIN We hit the walking hinge again.

SCOTT Did it come loose?

IRWIN Yes.

SCOTT Let's see, Houston the walking hinges are
unlocked again. Is that right?

CAPCOM They're supposed to be unlocked now, Dave.

SCOTT Okay.

IRWIN Once you see those things unlocked up there
in the stowed position, it doesn't give you too good a feeling.
Looks like she's coming down okay.

SCOTT Can you pull it out a little bit, Jim?

IRWIN How's that?

SCOTT That looks good. Okay, that's good. Out rigger
cables are -

IRWIN That one over there's not.

SCOTT Okay, outrigger cables are loose.

CAPCOM Roger.

IRWIN Watch the rope and watch the glass ball.

SCOTT I got it.

IRWIN Outrigger cable is loose and OFF.

SCOTT Okay.

IRWIN Let's come down with the left tape.

END OF TAPE

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SCOTT Now on the left tape. Easy does it. It's coming okay.

IRWIN Okay. Dave looks like it's loose to me.

SCOTT Okay, that's good.

IRWIN Okay. Let you go put the - come on over and we'll GARBLE. Man this thing is nice and light. Get the old hinge pins out. GARBLE.

SCOTT Let's see. I've got a hinge pin out - I'm going to get you the tool, maybe you can reach it Jim.

IRWIN Maybe I can reach it.

SCOTT Hey, Jim.

IRWIN Yeah.

SCOTT Need you to get this hinge pin over here.

IRWIN Okay. Oh shoot. Did you see my hinge pin on my side.

SCOTT It looks like it's almost all the way in.

IRWIN Yeah, but not quite. How about putting the tip of the tool on it and pushing it.

SCOTT There you go.

IRWIN Okay.

SCOTT Now, let's line this up a little straighter. Let's pull the rear end back towards me.

IRWIN Okay. There. Okay.

IRWIN Okay, chassis hing pins are inserted on my side.

SCOTT Okay.

IRWIN GARBLE. GARBLE the lights on.

SCOTT Did it.

SCOTT Okay, let's -

IRWIN Yeah. Over on the MED there.

SCOTT I'm not sure the telescoping rods are disconnected. Let's pick it up and move it back and turn it around, okay?

IRWIN Okay, turn it what your way?

SCOTT Your way.

IRWIN Okay. Ha ha.

SCOTT (garble) not disconnected to me.

IRWIN Put it down right there, and maybe take it forward a little bit.

SCOTT Well, the pin is out. The rods the whole saddle up here is still on, both pins are out. See what I mean. I think we can maybe lift the front end up, can't we.

IRWIN Sure. Let me get in there and lift it up maybe here. Let me pull it this.

SCOTT Wait a minute.

IRWIN Let me twist it this way to give you a little more room.

SCOTT Okay GARBLE saddle.

SCOTT You'll never get in there with the PLSS, Jim.

IRWIN Am I too tight.

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SCOTT Yeah, forget it.
CAPCOM Jim, verify you pulled the saddle pin, please.
IRWIN Any suggestions.
SCOTT GARBLE verify GARBLE.
SCOTT yeah, the saddle pin has been pulled.
IRWIN I've got to somehow -
SCOTT Okay, Joe, the situation is that both pins are
out of the saddle and it still seems to be connected to the
frame of the LRV.
CAPCOM Roger we copy and we're working it.
SCOTT Okay, let's finish picking up the rover.
IRWIN Yeah.
IRWIN I remember a guy who once said dirt dirt and it
is ever.
CAPCOM Dave and Jim pull the rover as far out as you
can away from the LM and then pull on the front end if you
could.
IRWIN Okay, standby.
CAPCOM And by that we mean lift up on the front end
of it.
SCOTT Yeah, lift up on the front end, yeah.
SCOTT We copied, Joe.
IRWIN Get this down here, try to listen too.
SCOTT Okay, let's try that Jim, okay.
SCOTT Okay, pull it on as far as we can and back
as far as we can.
IRWIN Okay.
SCOTT Okay, I'm ready.
IRWIN That's about as far back as we are going to
be able to get, Dave.
SCOTT Yeah.
IRWIN If you want to hold it there, I'll get in
front of it and try to lift it up.
SCOTT Okay, I'm holding.
IRWIN Okay. GARBLE clear this.
SCOTT Now your PLSS is hung up, Jim.
IRWIN It's coming - there we go.
SCOTT Good show.
IRWIN Okay let's turn -
SCOTT Okay, Joe, it's off. Turn it around now Jim.
IRWIN Okay.
IRWIN Okay I've got my grip here dave. GARBLE
we'll turn it.
SCOTT yeah GARBLE.
IRWIN Come to your left don't - don't walk back -
just swing left. Okay.
SCOTT That a boy. We want to get a down hill run here.
Yeah, back up a little bit. Just back up a little bit,
go in reverse you. That's good right there. Okay.

APOLLO 15 MISSION COMMENTARY, 7/31/71 GET12019 CDT0853 333/3

SCOTT Watch your ball behind you. I've been watching that all morning. I just about fell on it.
IRWIN noticed. Did you say the console unlocked.
SCOTT Yeah, it is unlocked.
IRWIN Lock it.
SCOTT Okay.
SCOTT Okay, my side is locked.
IRWIN And my side is locked.
IRWIN This side looks okay, Dave.
SCOTT Okay.
IRWIN Give me time with the velcro.
SCOTT Okay, you almost have to pull against the shear force in order to get the seat up. I had to really really tug at it.
IRWIN Okay I'm in. It's awfully bouncy too isn't it. Okay. Get your seat belt out later I reckon.
SCOTT GARBLE.
IRWIN Yeah, we might as well get it now.

END OF TAPE

IRWIN Give a holler when you're ready to drive,
Dave, I'll come out and take pictures, okay?
IRWIN Sticky fenders.
SCOTT Got a fender, Jim. Get your fenders?
SCOTT Go ahead I'll get them.
IRWIN Boy, is this dirt soft. Man.
IRWIN Like soft powdered snow. Really is' It
looks a little different -- different.
SCOTT Okay, looks like the brake's on push this down
so I'll see if I can't hop in it.
SCOTT That's a reasonable fit.
CAPCOM Okay, Dave. And buckle up for safety here.
SCOTT (garble). Oh, yeah.
SCOTT Okay, safety belt's on.
SCOTT You sit up a lot higher. And in one jeep.
It doesn't make sense, does it?
SCOTT Okay, hand controller is locked. Brakes
on and reverse is down. Circuit breakers all except the OX
and the NAB are coming closed.
SCOTT Okay, I get readings on bus B.
SCOTT All the switches are off by the way.
SCOTT Okay, switches are all closed. Okay, Houston,
are you ready to copy some numbers?
CAPCOM Go.
SCOTT Okay. Amp hours 105 and 105. Amps of course
are at zero. The K volts -- on number 1 I got about 82 and number
2 is reading zero - huh. K and -- on the battery temperature, I'm
reading 68 about 78 and 80 and the motor temps are off scale
low, of course.
CAPCOM Roger, copy.
SCOTT And the only discrepancy so -- and the only
discrepancy so far, I don't have any volts on number 2.
SCOTT TWM select as volts, drive and able. Forward
TWM 1, reverse TWM 2. And Houston, I'll stand by for any comments
you might have on that readout.
CAPCOM Roger, Dave. I know you've rechecked your
circuit breakers there.
SCOTT That's correct. The circuit breakers are
all in.
IRWIN Dave, just let me know before you drive.
SCOTT Yeah.
CAPCOM Dave, we're standing by for you to drive away
and monitor the AMPS -- the AMS on battery 2, please.
SCOTT Okay, will do.
SCOTT Okay, 15 volt DC is going to secondary.
CAPCOM Steering foward bus A.
SCOTT Rear to bus D. Try power, forward to

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 120:29 CDT 09:03 334/2

SCOTT Buss A.
CAPCOM Roger, Dave. And if battery 2 is out on us we'll have no rear steering or no rear drive is the advice.
SCOTT Okay, got a detent, we're moving.
CAPCOM Extraordinary
SCOTT hey, Jim, you can probably tell me if I get any rear steering.
IRWIN Yeah, you have rear steering.
SCOTT Okay.
CAPCOM Do you have Amps on batt 2, Dave?
IRWIN Not sure about that battery bit.
SCOTT Negative.
SCOTT I don't have any front steering, Joe.
IRWIN Got just rear steering, Dave.
SCOTT Yeah.
CAPCOM And Dave while you're rolling there, requesting forward bearing to Buss C - Buss CHARLIE.
SCOTT Okay. During forward to buss CHARLIE. Still no forward steering, Joe.
CAPCOM Roger.
IRWIN Dave, got another suggestion?
SCOTT Roger.
CAPCOM Cycle that forward steering circuit breaker, please.
SCOTT Okay.
SCOTT Okay. I go to buss CHARLIE and the circuit breaker is cycled. No forward steering, Joe.
CAPCOM Roger, Dave. Press on.
SCOTT Okay. That's a good idea. Here, Jim, I'm going to bring her around here and let's get on with it.
IRWIN Okay.
IRWIN We going to have a great time with all these hills and mounds around.
IRWIN Dave, think they can handle it there?
SCOTT Yeah, that's good.
IRWIN Okay, brakes on. Power 4 coming off. Off on the steering. Off on a 15 volt DC.
SCOTT Okay. Temp looks about the same, Houston.
SCOTT Jim, soon as you get -- that dust brush out I want to brush off so we don't get the old rover too dirty.
IRWIN Okay.
SCOTT You know something. As I look back behind us. It almost looks like we landed in another oh, 10 meters aft and we would be a severe crater.
CAPCOM And Dave and Jim, you're both off the TV camera now. We're standing by for description of your progress.
SCOTT We'll be back on occasionally as we get to the mesa. Back with you now?

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 120:29 CDT 09:03 334/3

CAPCOM Don't worry about it, Dave. We figured
you're starting to come into view now.

SCOTT I want to move the TV camera because it'll
save us time if we don't have to tell you what we're doing.

CAPCOM Okay, fine. Now --

CAPCOM Roger, Dave. Perfect.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET12039 CDT0913 335/1

CAPCOM Roger, Dave. Perfect.
IRWIN I have the 16 millimeter on the rover.
CAPCOM Roger.
IRWIN And the commander's 70 millimeter's over there.
CAPCOM Roger.
SCOTT Man, this is really tricky work and
on this slope and this soft material.
IRWIN It sure is.
CAPCOM We copy Dave and Jim, and we're stand-
ing by for an EMU status check.
SCOTT Let me know when your finished.
SCOTT Jim reading 38 on my guage. Flags are
clear and I'm reading 75 percent.
CAPCOM Roger.
IRWIN Okay, I'm reading 385 flags are clear
and I'm reading 75 percent.
SCOTT Trying to like walk up out of a crater
each time.
IRWIN Can you make it.
SCOTT Yea I'll make it. I don't know how
it's going to work when I get that geology pallet. I need a little
help there. In the (garble) Okay, I have a flag - I have a tone, -
rather.
IRWIN I got one, I guess I heard yours.
CAPCOM Roger.
SCOTT Got any flags Jim.
IRWIN I can't quite see it. No I don't
have any flags.
CAPCOM We concur Jim. No flags.
IRWIN Are you finished at the MESA for
a little bit Dave?
SCOTT No. Say, I'm gonna - (garble) is really tight.
CAPCOM And Dave, this is Houston. Be advised
Jim's got a flap hanging from the lower right hand corner of
his PLSS which perhaps you could button up the next time you're
close to him.
SCOTT Yea Okay. It's his water flap.
IRWIN Yea, I can see that in the shadow.
SCOTT Yea, we're going to have to do some
cleaning of him and get that dirt off so we got thermal
problems. Take this out. Hey, I've got a tone again.
IRWIN This stuff just -
SCOTT What Jim.
IRWIN Flags are clear.
IRWIN TCU was wedged in very tightly.
CAPCOM Jim, all our numbers on you look
good down here.
IRWIN Okay. I keep getting a tone.
CAPCOM And Jim, this is Houston. Requesting
an EMU mal number 5 procedure when you get to a convenient break
point, over.

IRWIN Okay EMU number 5.
SCOTT Need some help with that.
IRWIN I think I'll get it Dave.
SCOTT Okay. I'm going to come button your flap here.
IRWIN I'd better take a break and find out what's causing the tone.
SCOTT Yea. I think you'd better.
SCOTT Why don't you just go through EMU number 5, and I'm just going to close your flap here. (garble)
IRWIN I don't have any flags at all.
SCOTT Stand still a minute so I can get this flap Jim.
IRWIN Certainly -
CAPCOM And Jim if you want, I'll check your previous (garble) there.
IRWIN Okay. Your burner valve is in intermediate.
SCOTT Okay, Joe, I'm looking at the EMU number 5.
CAPCOM Roger. I give the staff there creators on 34.
IRWIN (garble)
CAPCOM and after tone off, cycle mode select switch to AG and then to AR. No tone.
IRWIN Okay
CAPCOM No vent or O2 fail.
IRWIN Okay, I'm getting a P in the vent window.
CAPCOM Say again Jim.
IRWIN I have a P in the vent window.
CAPCOM Roger.
IRWIN I'll cycle the fan.
CAPCOM Roger. Copy you're cycling your fan.
IRWIN Yea. Fans back on. I have good flow Joe.
CAPCOM Roger.
IRWIN But I have a P in the vent window.
CAPCOM Roger copy.
IRWIN Keep a watch on it. I'm going to press on slowly.
CAPCOM Roger, we agree.
CAPCOM And Jim, we think we just have a flag and tone problem All your numbers look clean as can be down here.
IRWIN Well, that's encouraging.
IRWIN Dave. Do you want me to, are you finished with the this pallet that's here at the MESA.
SCOTT Oh yea, you can dump it. I had to take the pallet out to get the TCU off.
CAPCOM And Dave, your setting a new outdoor record with each toss there.

APOLLO 15 MISSION COMMENTARY 7/31/71 GET12039 CDT0913 335/3

IRWIN That's pretty neat. At least we
won't clutter up the immediate vicinity. Joe, I have a tone
again but I won't even bother telling you cause it's -

CAPCOM Roger Jim, that's true. We can tell
when you get a tone down here. We hear it as well.

IRWIN Okay.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/31/71, 9:23cdt, 120:49get, 336/1

IRWIN Okay.
SCOTT So do I, Jim.
IRWIN Disturbs you too, doesn't it?
SCOTT Yep. Sure does.
SCOTT (laughs)
IRWIN Yeah.
SCOTT That tape for the MESA blankets is something
again.
IRWIN Are we deployed already?
IRWIN You can tell Joe I have the geo pallet
on the backend of the rover. I don't know whether it's locked
on there properly yet.
CAPCOM Roger, Jim.
PAO High gain antenna being mounted on the rover.
IRWIN Well, it looks like the pallet is secured
to the rover.
CAPCOM Roger.
SCOTT And taking a hand rail (garble)
SCOTT Okay, Joe, I'm going to put the TV on the rover
now, if you're ready and so far the LCRU is on, locked,
cable's connected, the high gain antenna booty is on. I'll
get the antenna as soon as we get the TV on.
CAPCOM Roger, Dave. Have at it.
SCOTT I'll tell you that rover is a pretty picture
out there.
IRWIN Sure is that.
SCOTT Picture's turned on.
IRWIN Sure is that.
SCOTT Picture's turned on.
IRWIN Okay, SRC1 is going to stable, Joe.
CAPCOM Roger, Jim.
PAO A mild bit of levity here in the control
room. A duplicate of the instrumentation and communications
officer, INCO, a TV control panel has been placed on top of
Chris Craft's console with a card hanging below that says:
Cecil B. DeCraft.
SCOTT (garble)
CAPCOM Roger.
SCOTT FRC. And (garble) 1 gone.
CAPCOM Okay.
IRWIN Here you are.
SCOTT There goes the old TV. Trouble getting it
to fit today.
SCOTT And the TV handle is down in the sides.
(garble).
IRWIN And I'm configuring the GEO pallet now Joe.
CAPCOM Okay, Jim.
IRWIN The TV cable is connected.
CAPCOM Rog.
IRWIN Okay (garble) LCRU's circuit breaker is
closed. And the LCRU power going to internal. TV power

APOLLO 15 MISSION COMMENTARY, 7/31/71, 9:23cdt, 120:49get, 336/2

SCOTT switch to ON; with the antenna coming up;
IRWIN Okay, LCRU is going TMI narrow band
CAPCOM Roger.
SCOTT Okay. Okay I've got readings for you here
Houston, if I can get down to it.
CAPCOM Okay, Dave.
SCOTT The AG - AGC is 2.7, radiator temperature
1.6, and the power is 2.9.
CAPCOM Copy.
SCOTT Okay, I'm now going check it - check of the narrow
band, Joe?
CAPCOM Stand by, Dave.
SCOTT Okay.
CAPCOM And we're going to narrowband.
SCOTT Okay, give me a call when you want to go
to (garble)

END OF TAPE

IRWIN How are you coming?
 SCOTT Fair.
 CAPCOM Okay, Dave. How do you read Houston?
 SCOTT Houston. I read you loud and clear.
 CAPCOM Okay, Dave. TV remote please.
 SCOTT Okay, going to TV remote.
 CAPCOM Okay, Dave and continue on please -
 SCOTT Okay.
 SCOTT LCRU blankets are 100 percent open vector covers are closed, the dish is deployed. See if I can find the earth.
 SCOTT Okay, pointing right at you, Houston.
 CAPCOM Okay, Dave. Thank you.
 SCOTT Okay, she's all yours.
 CAPCOM Roger. No TV yet, but we're looking.
 IRWIN Got your favorite gadget back here, Dave.
 SCOTT Oh, good.
 CAPCOM Okay, Jim. And we assume in the meantime you're pressing on here.
 IRWIN Oh, yes. We're pressing on.
 CAPCOM Dave, we want you to verify the C TV switch ON please. And that the high gain is pointed in TV remote.
 SCOTT Okay, Joe stand by. We'll look.
 SCOTT Okay, we're in TV remote, high gain is looking right at that very pretty blue ball up there. (garble) the ball. I did turn the C TV ON. It's a spring loaded switch, I'll do it again.
 CAPCOM Roger.
 SCOTT And it's spring loaded again. It moved. Maybe that's just Jim, moving the rear end.
 CAPCOM Presto, chango. There's the TV.
 SCOTT Oh, beautiful. I'm glad to hear that. Okay, your general direction right now is pointed to southwest. You can probably look down and see the LM shadow. And the sun is at about 730 to you now so you don't get in that kind of trouble.
 CAPCOM Roger, Dave. We copy and hustle on please.
 SCOTT Yes sir.
 SCOTT Okay, in the seat pan on the CDR side:
 MAG E MAG (garble) MAG OBOE MAG Hilo, the LRV map holder is out and I'll get it stowed here in a minute.
 CAPCOM Roger.
 SCOTT Mag Lima is on the (garble , LMP's camera. 500 with MAG Metro is in the seat pan and tucked away.
 CAPCOM Roger.
 SCOTT And Joe, in bag 2, I have the core stems and caps. I put bag 2 under my seat.
 CAPCOM Okay, Jim. Sounds good.
 CAPCOM And the TV scenery for us is breath taking.
 SCOTT Good. Can't be half as breath taking as the real thing though Joe, I'll tell you. Wish we had time to just stand here and look.

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 120:59 CDT 9:33 337/2

SCOTT I'll tell you, you might take a look at the old LM. She sure does a good job of landing in this kind of terrain.

IRWIN (garble) is on. Mag number 4 is on the right of the tool carrier.

CAPCOM Roger, Jim.

SCOTT The unstable base sure makes a difference doesn't it, Jim?

IRWIN Sure does.

IRWIN Okay, and the sample bags are on the (garble) Hey, Joe. I'm going to get the rake.

CAPCOM Orger.

IRWIN Go get the rake. Have to rake a lot of this wouldn't you? Yes, the rake may be a good thing. Cause it doesn't look like we're going to have any piles or chips around.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/31/71 GET12109 CDT0943 338/1

SCOTT Okay, maps are in.
SCOTT Okay, maps are on and your sample bag holder is on your camera, Jim. Put the sun compass A overlay map in my seat pan.
IRWIN Okay, I'm securing the handtool kit.
IRWIN Got area here for driving.
SCOTT Good. Hey get the - Jim before you go back get the dust brush out and I want to get you dusted off.
IRWIN Yeah. I don't want to take all that dirt into the LM. Boy is it dirty. Where are you on your timeline Dave.
SCOTT HMU in ingress and I'm ready for you.
IRWIN Dave, did you brush me off all the way? Okay.
IRWIN They really are dirty. I want you to get my antenna too before I go in. My harness is still secure, isn't it?
SCOTT Yeah, your harness is fine, except for the dirt.
CAPCOM And Dave this might be a good time to button up the corner of Jim's PLSS bag.
SCOTT It's all buttoned. I got that a little while ago, Joe.
CAPCOM Roger, sorry, I missed it - for your thinking we're down about 25 minutes but no problem.
SCOTT Okay, I guess we expected that.
CAPCOM Roger.
SCOTT Hold this brush a minute and stand there.
IRWIN It did come off, okay give me the brush, try to get as much as we can.
SCOTT I think it will help if you kick your feet when you go in because a lot of this stuff will come off.
IRWIN Yeah.
SCOTT Can you bend over a tad?
IRWIN How's that?
SCOTT Yeah, that's good. Okay, I think I got the major portion of it Jim.
IRWIN Okay, you want to stow my antenna.
SCOTT Oh, let me get your foot here.
IRWIN Okay.
SCOTT That worked out kind of slow but it's another game, isn't it. Okay, it's stowed. You'll stow the brush while I get in.
IRWIN Yeah, I'll get the brush.
SCOTT Okay. Be careful.
IRWIN Yeah.
CAPCOM And Dave, this is Houston while you are stowing the brush there, just thinking ahead we've got a couple of checks to carry out on the rover before you drive off from the site.
SCOTT Yeah, that's good, Joe. Go ahead.

APOLLO 15 MISSION COMMENTARY, 7/31/71 GET12109 CDT0943 338/2

CAPCOM Rog. We'll want you to look at the front wheel steering decoupling lanyard for us and then after that physically try to turn the front wheel for us.

SCOTT Okay.

IRWIN Why would anybody put a snap there?

SCOTT Gee, watch me flounder around out here.
Okay the decoupling lanyard is taped down, Joe. I guess -

CAPCOM Roger, that's good, Dave, you might physically try to turn the front wheel, if you think now is a good time.

SCOTT I don't get much out of turning the front wheels.

CAPCOM Okay, I think we're in business. We'll want 15 volts to primary and forward steering to bus A when you start off.

SCOTT What makes you think we're in business? What did I do?

CAPCOM Dave we can get this later when you are ready to go.

SCOTT Okay.

IRWIN Okay, I've got a trench.

SCOTT Jim, hung up.

IRWIN Go easy, go easy. Standby. Let me come up there and watch you. Take it easy.

IRWIN Okay come - yeah, problem, okay, come left - left - left - your shoulders to the left. Turn your hips to the right. Push down. Okay, you okay? PLSS is catching on the - there you go - a little more - a little push up there, just stoma down, Okay, get - your right shoulder down

IRWIN Right shoulder down. Now go forward.

IRWIN Attaboy. There you go. Okay. No mark. I saw some - looks like underthere.

IRWIN Okay, I'm in. That's a real hooker there. I don't ever remember seeing that in the 1/6th G training.

SCOTT Okay, Jim take a little break up there, and let me pass you the GARBLE, okay?

IRWIN Okay let me get this TV up.

IRWIN Hold a minute. I'm ready, okay.

SCOTT Hold on.

IRWIN Not doing a thing except hooking it up.

SCOTT Okay.

IRWIN Okay, now I'm ready when you are.

SCOTT Okay, I'm ready.

IRWIN Okay, go ahead.

END OF TAPE

SCOTT (garble).
IRWIN Yeah, it is.
SCOTT There you got it. Keep coming. Keep coming.
SCOTT Atta boy, right over the step now.
SCOTT A little more. There you go. It's over
the step.
SCOTT You know, I tell you there's a lot better way
to get that up.
IRWIN I hope so.
SCOTT Yeah.
SCOTT Next time I'll shove it up the ladder.
IRWIN Here you go, Dave.
IRWIN (garble).
SCOTT Yeah, next time, we'll just bring it up
the ladder.
SCOTT You doing that. Anything else we can do
on a rover here, Joe?
CAPCOM Negative, Dave. Just press on and we'll
give you some more words when you're ready to drive off.
SCOTT Okay.
SCOTT Got the pallet disconnected, Jim?
IRWIN Say again, Dave.
SCOTT Is the pallet disconnected?
IRWIN Yeah -- oh, no. Stand by.
SCOTT Disconnect to LEC. Let me pull it back down.
IRWIN Yeah. Just a minute.
IRWIN Okay, Dave. It's disconnected.
SCOTT Okay.
SCOTT Okay, I'm going out to the - to get the nav initialize
IRWIN Okay.
CAPCOM Okay, Dave, this is Houston with the rover
procedure for you. As you get on, we want the 15 volt to
primary and forward steering to buss ALFA.
SCOTT Okay, Joe. First, let me stow a high-gain
and give you a PMLWB.
CAPCOM Roger.
SCOTT So I'm going to turn you off.
CAPCOM Okay.
CAPCOM On PMLWB.
SCOTT (garbled) stowed.
IRWIN Joe, how do you read me on the LM?
CAPCOM Jim, you're 5 by.
IRWIN Good. Okay, I have the pallet unloaded on the
MESA. Reconfiguring the COMM circuit breakers.
CAPCOM Roger.
IRWIN Switches?
SCOTT Okay, Joe, Give me a call on those switches
again.
CAPCOM Okay, Dave. 15 volts to primary, foward
steering to buss ALFA.

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 121:19 CDT 09:53 339/2

SCOTT Primary buss ALFA.
CAPCOM Roger. Now, we want you to rock the hand controller full left and right and watch the ammeter while you do that on the batteries and look for small deflections in those ammeter readings.
SCOTT Okay.
SCOTT Joe, the only switches I have on are 15 volt DC prime and steering forward buss A.
CAPCOM That's correct, Dave.
SCOTT There --- I can't perceive anything, Joe.
CAPCOM Okay, Dave. That's all we need. Press on as always.
SCOTT Okay. Who's going to tell us?
IRWIN Okay, Joe. Under COMM TV is coming open.
CAPCOM Okay.
IRWIN Module A going to PM. Power amplifier off. PCM going low.
CAPCOM Okay, Dave. While you're getting configured there, we think both your batteries are okay. There is something wrong with the forward steering and we'd like the forward steering switch to off. We still have good rear steering.
SCOTT Okay, forward steering is off, Joe.
PAO This is Apollo Control --
SCOTT I'm in a nice smooth area now. Do you want to point any particular direction or will you take this one.
IRWIN Don't worry, I'll get it. I know where I'm going.
SCOTT Tried to find a good smooth area with all the qualifications around here.
SCOTT Okay, Joe. I'm at the nav initialization stage here.
CAPCOM Roger, Dave. We're standing by.
SCOTT Okay.
SCOTT Okay, nav circuit breakers going close. It's driving. System reset. (garble) on 3 minutes here. Okay, LRV systems if you want. What does the readout on the RV, Joe, or are you happy with what you got?
CAPCOM Dave, give us your AMP hours again, please.
SCOTT Okay, AMP hours 105 on number 1 and I'm sorry. 110 on number 1 and 115 on number 2.
CAPCOM Roger.
SCOTT Okay, and attitudes, if you're ready to copy.
CAPCOM Go.
SCOTT Roll was 1 left. Pitch is zero. Heading is 240. I'm in system reset and we're driving down to zero and the sun shadow device is at zero.
CAPCOM Okay, Dave.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/31/71, 10:04cdt, 121:29get, 340/1

CAPCOM And, Dave, you're going to be close to
279 on your heading and I'll fine tune that in a minute.
SCOTT Okay, well I'll stand by, I'm still -
the system resets still (garble)
CAPCOM Roger.
CAPCOM And, Jim, we'd like for you to take a
breather here for a minute while Dave's getting the NAV
realigned.
IRWIN Okay. All I do is paddy the blanket.
SCOTT Say, Jim, try some of that fruit stick;
it's really good.
IRWIN I'd forgotten about it.
SCOTT Boy, I just tried a couple of bites and
it's really good.
IRWIN Full of quick energy.
SCOTT No water.
CAPCOM And Dave, the fine tune heading is 279.
SCOTT 279. Rog.
PAO One hour 53 minutes into EVA 1.
IRWIN Okay, the MESA blankets are padded, Joe.
CAPCOM Okay, Jim, sounds good.
PAO Pressure in both suits staying at 3.8 pounds.
SCOTT Okay, Joe, we should know at 279, systems
reset is on.
SCOTT SSD is stowed.
SCOTT And, now, let's see.
IRWIN That's good Dave. That's good there, can
you come and join me?
SCOTT Yeah, I'm right behind you.
IRWIN Oh, you are?
SCOTT Yeah go show
IRWIN Let's go I'm ready to configure you.
SCOTT Good.
IRWIN Or you configure me.
SCOTT Okay, let me get the switches off here.
So we don't have anybody drive off with it while we're gone.
IRWIN Okay, I put on my antenna so I can read
you a little better.
SCOTT Yeah, that's a good idea.
SCOTT Okay, that antenna is up.
IRWIN (garble) flat. Now we got it fixed.
SCOTT Okay. The hammer is on the LMP.
SCOTT Got some core tube caps for me?
IRWIN Got some core tube caps for me?
SCOTT Yeah.
IRWIN (garble)
SCOTT Dog gone thing.
SCOTT Core tube caps didn't fit.
SCOTT Pitch it up, Jim.
PAO Commander Dave Scott attaching geology
equipment onto the lunar module pilot's portable life support

APOLLO 15 MISSION COMMENTARY, 7/31/71, 10:04cdt, 121:29get, 340/2

PAO system.

SCOTT Turn it to your right and I'll put it on.

END OF TAPE

SCOTT Okay, bag number 4 in on the LMP. Okay.
IRWIN Get me, ole buddy.
CAPCOM Okay Dave and Jim. As a reminder
before you climb on the rover. You may want to go to MEN
cooling. It may get chilly while you're riding.
SCOTT Okay.
IRWIN Are your bags secured.
SCOTT Okay.
SCOTT How do the pictures look to you down
'there Joe?
CAPCOM They're looking smooth as silk down
here.
SCOTT Okay.
CAPCOM And Jim, if convenient now you might
give us an EMU status check.
IRWIN Okay, I'm reading 385 all flags are
clear and looks like 65 percent .
CAPCOM Rog.
SCOTT Okay, Joe. I'm reading 65 percent
all flags clear and 3.85.
CAPCOM Roger Dave. Let's do a little geology.
SCOTT That's the boy.
SCOTT Okay Mr. Navigator. By the way, the little
arrows on the head indicator on the LRV nav system work good.
CAPCOM Okay, we copy.
IRWIN Okay, this thing is really bouncy when
you get on.
SCOTT Easy, easy, easy Jim. Easy.
IRWIN Okay. My foot is hooked on the tool
there. That a boy. You released it high.
SCOTT Yes you do.
IRWIN It's almost like standing up.
SCOTT (garble) fact I can't put -
IRWIN Down to the maps, let's see.
SCOTT Okay. Can you get to the maps.
IRWIN Get my saftey belt.
SCOTT Yea. Be careful you don't hit our
jackrabbit switches there.
IRWIN There's something wrong with my
safety belt. I'll have to fix it.
SCOTT As long as your getting off, will
you adjust mine.
IRWIN Sure.
SCOTT How did it get down there.
IRWIN I'll look at the maps.
CAPCOM Okay, Dave. and we're standing by
for a mark as you leave.
SCOTT Yea, okay Joe. I got my trusty
seat belt hooked under a plug. (garble) suprise.
IRWIN I think it's too short Dave.

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SCOTT Yep, it sure is.
SCOTT Don't waste time on it, I'll just hang on.
IRWIN No, let's start out right.
IRWIN (garble) At least for now.
IRWIN We've got to far to go.
IRWIN Okay, you're hooked. Sort of, can you
get if off. Hope you can get it off.
IRWIN Think In can. (garble)
SCOTT A couple of tries at getting, getting
off. Ought to be able to do pretty good.
SCOTT Okay, I've got mine.
IRWIN Okay, I'm supposed to give a few readings
here.
CAPCOM Go ahead Jim.
IRWIN Are you ready to copy some readings
Joe.
CAPCOM Roger.
IRWIN Okay 250 000 well all zero's there.
AMP hours 090 092 80 85 and forward motor temps are lower limit
in the rear lower limit.
CAPCOM Roger Jim. Thank you.
IRWIN Off scale low.
SCOTT Okay Jim. Here we go.
IRWIN Okay Dave. We want a heading of 203.
SCOTT Okay 203.
IRWIN Check point one.
SCOTT I'm going to miss that double (garble)
I can see that now.
IRWIN Okay, we're moving forward Joe.
CAPCOM Roger.
IRWIN Whew. Hang on.
IRWIN And we're coming around left. Heading
directly south right now to miss some craters off to our right.
Very subdued creators.
SCOTT Okay, I'm going to take a little ziz zag
here -
IRWIN On the right is -
SCOTT Hang on. Get a feel for this thing.
IRWIN 9 kilometers an hour, Joe.
SCOTT Hold the geology. Let's get the rover
squared away first.
IRWIN Okay. 8 Kilometers up a little rise.
8 turning back.
SCOTT 203. Okay.
IRWIN 203 for 2 miles.
SCOTT Okay. That's a nice young fresh one.
CAPCOM Dave and Jim, Houston.
IRWIN Dave veering between 8 and 10.
SCOTT Go ahead Houston.

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CAPCOM Roger. Our TV pan suggests you can go straight for St. George crater and you'll find (garble) okay. And they were suggesting you omit check point 1. Rhysling crater should be a good landmark along the way and head 208. Over.

END OF TAPE

CAPCOM and head 208. Over.
IRWIN Okay, 208, Joe.
SCOTT Okay, we're doing 10 kilometers now.
Now we're heading up hill and when we head uphill it drops
down to about 8. No dust, Joe. No dust at all.
CAPCOM Yes sir sounds great.
CAPCOM And Jimmy, we're standing by for AMP readout.
SCOTT (garble) kilometers now.
IRWIN Okay, amp readout is 15 - looks like 15 on 1,
I can't quite see 2.
SCOTT Okay, could this be Rhysling right here, Jim.
IRWIN Probably is - this large depression off here
to our left?
SCOTT Yes.
SCOTT Man, I can see, I'm going to have to keep my
eye on the road.
SCOTT Boy, it's really rolling hills, Joe. Just
like 14. Up and down we go. Oh, this must be Earthlight,
huh? Could that be? Boy look at that. We're going to have
to - maneuver it here.
IRWIN There's a long depression here before you get
to Rhysling. I don't think we're to Rhysling yet - Rhysling
ought to be about 1.4 and we've only gone see .4.
CAPCOM Roger, Jim. We think you're short of Rhysling
now.
IRWIN Do you think that's probably Rhysling out
about 11:00 o'clock to us, Dave?
IRWIN Maybe about 1 kilometer.
SCOTT Okay, Joe. The Rover handles quite well.
We're moving at I guess, an average of about 8 kilometers
an hour. Its got very low damping compared to the 1G Rover,
but the stability is about the same. It negotiates small
craters quite well although there's a lot of roll. It
feels like we need the seat belts, doesn't it Jim?
IRWIN Yes, really do.
SCOTT The steering is quite responsive even with
only the rear steering. It does quite well. There doesn't
seem to be too much slip. I can maneuver pretty well with
the thing. If I need to make a turn, sharply - why it
responds quite well. There's no accumulation of dirt in
the wire wheels.
CAPCOM Just like in the owners manual, Dave.
SCOTT Okay, we're heading right - Yes, man. Okay,
I've got it on the wall here for a minute. And we're up
to 12.
IRWIN Then, as we head upslope, it drops off.
SCOTT Yes.
IRWIN Or are you deliberately slowing down?

SCOTT Yes, I slowed down. I want to get my feeling here before we start sprinting.

SCOTT Look at this little fresh one - little fresh one, boy look at that - frags - little angular frags all over the thing.

IRWIN Yes, we passed several of those.

SCOTT Okay, I'm going to cut down to the south here, Jim.

IRWIN Yes, it'll probably be best. Cause I think that's probably range .7.

SCOTT Still not Rhysling.

IRWIN Shouldn't be.

SCOTT Whoa. Hang on.

IRWIN We have a large subdued one at our 1 o'clock position. I'd estimate 50 kilometers wide.

CAPCOM Roger, Jim.

IRWIN .8. Okay, how we doing on the image. Over.

SCOTT Gee, if we're heading right for Elbow.

IRWIN Pick a spot here Okay. You really have to pick your way.

SCOTT Yes.

IRWIN We're only about half way to checkpoint 1. We shouldn't - but I thought it was Rhysling and it was probably not Rhysling. Rhysling is a larger crater and it's out at about 1. - should be about 1.4.

CAPCOM That's affirm, Jim. Ride on.

IRWIN Okay.

IRWIN Whoa.

SCOTT Hang on.

IRWIN Bucking broncho.

SCOTT Yes, man.

SCOTT You back off on the power and it keeps right on going.

SCOTT The zero phase lighting is pretty tough, Joe. We're going to have to make sure we keep at an angle. Once I look in zero phase, it all looks flat. There's a nice little round 1 meter crater with very angular frags all over the bottom and the rims and glass in the very center. About a meter across.

CAPCOM Roger, Dave. And Jim, as you come up on the rille, you may want to turn your 16 millimeter camera on.

IRWIN Yes, when we get to the rille, we will, Joe. We can't see the rille at all from here. Still looking for Rhysling.

CAPCOM Roger.

SCOTT 1.1. Right now our bearing is 039 for 1.1.

CAPCOM Roger.

SCOTT Hey Jim, give me - well I just have to drive around these craters - that's all there is to it.

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IRWIN Yes. We have a large subdued one on our right about 60 meters wide with several small ones in the center. By small I mean about 10 meters in diameter.

CAPCOM Roger, Jim.

IRWIN Boy, it really bounces doesn't it?

SCOTT Well, I think it sort of - the rear end breaks out at about 10 to 12 clicks.

CAPCOM Roger, Dave. It sounds like steering a boat with the rear steering and the rolling motion.

SCOTT Yes, that's right. It sure is. There's a good fresh one right down -

IRWIN Yes, I was looking at that one o'clock to us right now. A fresh angular block of lighter albedo material on the south rim.

SCOTT We kick up a little dust when we go through these craters.

IRWIN Yes.

SCOTT It seems like when we get to the bottom, and I can see the trajectory of the fragments coming from the - it looks like, yes they're coming from the front wheels and coming up kind of around my arm and then forward.

IRWIN Yes, but it's not dusty. I mean there's no -

SCOTT Looks like millimeter type particles. Hang on.

IRWIN Okay, let's see, the distance 1.3. Gee, I think there's a large one coming up about 12:30 or 1:00 o'clock that could be Rhysling.

SCOTT Okay.

CAPCOM Jim, it sounds good or it could be the large one to the northwest of Rhysling. Rhysling may be coming up on your left now.

IRWIN Well, there's a large one over there too, Joe.

CAPCOM Roger, but your heading is beautiful. Continue on.

SCOTT Okay. Our heading is averaging about 200 210.

SCOTT Man, this is really a rocking and rolling ride, isn't it? Never been on a ride like this before. Boy oh boy. I'm glad they've got this great suspension system on this thing. Boy. Okay, here's a big one right here on our left, Jim.

IRWIN Yes, but I don't think it's big enough to be Rhysling.

SCOTT No, I don't think it is either. We got a ridge up here in front of us.

IRWIN What did we say, Joe, about 1.6 1.7 for Rhysling?

CAPCOM It's about -

END OF TAPE

IRWIN Rhysling?
CAPCOM It's about 14 15 Jim.
SCOTT Let's get on top of it.
IRWIN That could be Rhysling, Dave. We'll find out when we get on top of this ridge.
SCOTT Yea. By the way Houston, your comm is crystal clear for us up here.
CAPCOM So is your's Dave. Maybe we ought to take this gear to Flagstaff next time.
SCOTT Yeah. Off in the west now I can see Bennet ridge.
IRWIN Oh yea, I've see it all the way. You can see just the peak of it almost all the time.
CAPCOM Rover, this is Houston. Your range to Rhysling is about 17 so you may be short of that step.
IRWIN We're just about 17 and our relative bearings 036. And our -
SCOTT Hey, you can see the Rill. There's the Rill.
IRWIN There's the Rill.
SCOTT Yea. We're looking down in it. Down and across the Rill we can see craters on the far side of the Rill.
CAPCOM Roger. Like advertised.
IRWIN Forgot to turn the camera on.
SCOTT Yeah. Now we're getting into the rocky stuff. About 1 foot quite angular irregular surface.
IRWIN We're right at the edge of the Rill I bet you.
SCOTT Yes sir, we're on the edge of the Rill. You better believe it. I think we're heading right -
IRWIN I don't Elbow, though, I see Elbow Say Dave, we have to stay up on the high part of the Rill here. Yes. You see Elbow is not as prominent we thought but there is a definite crator there.
SCOTT I see Elbow.
IRWIN Yes, it's subtle though.
SCOTT Turn on the camera. Hey look there is a big block on the edge of the Rille there that must be 10 meters. There's lots out front., but on the far side I don't see anything that would suggest really layering. There's a lot of debris, big angular blocks all the way down but nothing that you would really call exact layers.
CAPCOM Roger, we copy.
IRWIN You just got us back up on it. Back up on the ridge, I think it's smoother.
SCOTT Yea, I think that heading was, we were on a heading a little to far west. We're getting back up on the higher part of the Rille rim. At this point, I'd estimate the slope is probably what, about 3 degrees.

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SCOTT Yea, there's a definite ridge or rim that runs along the Rille maybe 70 or 80 meters from the inflection point that drops down into the Rille don't you think Jim.

IRWIN Yea. And we might as well, we're heading right toward, toward the east side of Elbow.

SCOTT Yea, we're in good shape. We can see Elbow, and we can see the front all the way down to the spur and there's not a big block on it.

CAPCOM Keep talking, keep talking. Beautiful description.

SCOTT Hang on.

IRWIN I see one large block up about a quarter of the way up the front, Dave.

SCOTT Okay, hang on there.

IRWIN Yeah.

SCOTT There's a big one partially buried. Oh there's some beautiful geology out here.

IRWIN Spectacular.

IRWIN Opps, watch that hold on. Looking up at the front now Joe, I sure see the linear patterns that Dave commented on before. With the dip and everything.

IRWIN Oh boy, good stroke.

SCOTT It's a good stroke alright.

IRWIN And I sure get the impression that it almost looks like a slump feature, but we'll take some good pictures of that cause you see the same linear type pattern in the east side of the Rille. And note the linear pattern there is parallel. Almost like layering in the Rille. And then as you look upslope up the front, that layering takes that dip to the north east that Dave had mentioned earlier.

CAPCOM Roger, Jim. And can you actually see the east side of the Rille towards the south.

IRWIN Oh yea, I can see looking directly south, I can see that exposure that faces north west. I can look down and I can see, I think I can see Hadley Sea down there.

CAPCOM Remarkable.

IRWIN Yea, I think I can see the south rim of Hadley Sea.

IRWIN Okay, let's see. We can see Elbow, but anyway when we get there -

SCOTT Hang on, got one coming.

IRWIN Okay.

SCOTT Oh my.

IRWIN It should be 2.7 but we've got another .7 to go.

SCOTT Okay, we're doing alright.

IRWIN Leads has been generally 10 clicks.

SCOTT Yes, but it takes (garble)

IRWIN Yea, and again looking at the, looking to the south along the edge of the Rille that faces to the northwest I can see several large blocks that have rolled down slope. Very large blocks that are about 3 quarters of the way down the slope into the Rille. That's just at the base of St. George.

CAPCOM Roger Jim, copy.

IRWIN We're heading, heading about 165 right now. We try to stay on the early level and smooth part of the rille rim, but looking over to the edge of the Rille at this point, I see a large concentration of large boulders. Large rocks and I'd estimate the size, they are angular and they are all the same color and texture, as far as I can tell from here. See that (garble) well you'd better watch the road.

SCOTT No, I see what your seeing there. You keep talkin'g let me drive.

IRWIN It's the first good concentration of large rocks that I've seen. Very similar to the large rocks that 14 saw at the top of Cone.

CAPCOM Roger, Jim. We copy and your range should be coming up on 3.1 at station 1.

IRWIN Okay, relative right now, Joe, our bearing is 18 range is 2.3.

CAPCOM Roger.

IRWIN Okay, now Joe I can see the bottom of the valley, the valley that leads down to Hadley Sea. I can see the bottom of the Rille. It's very smooth. I see 2 very large boulders that are right on the surface there. On the top of the very smooth portion of the bottom of the Rille. And the one to the southeast I can see the track of where it's rolled down slope.

CAPCOM Roger, Jim, copy. And is the bottom V shaped or fairly flat.

IRWIN I'd say it's flat. Right Dave.

SCOTT We'll it's hard to estimate.

IRWIN I'd estimate maybe oh 200 meters wide on the flat area of the bottom. Oh and I can see what we thought was Bridge crater. And it definitely would not have been a place to cross Hadley Rille. It's just a depression in the west wall of the Rille. and I, boy at this vantage point there's sure a lot more blocks exposed on the -

SCOTT Yea.

IRWIN On the far side of the Rille. I'm contrast- ing now the Rille to the southeast -

SCOTT Hang on Jim.

IRWIN Okay, and the Rille to the side of the Rille to the north west.

CAPCOM Roger Jim. Copy all that loud and clear, and Dave is the front wheel, are the front wheel wandering off of straight ahead as you drive along there.

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SCOTT No, they are okay Joe. It's just there a lot of creaters and it's just sporty driving. I've just got to keep my eye on the road every second.

CAPCOM Roger. We understand that just trying to get some engineering information here. Apparently your front wheelies are tracking straight ahead. Is that correct.

SCOTT That's correct and of course when we turn they dig in and it makes the rear end breakout but it's okay. We can handle it.

CAPCOM Knew you could.

SCOTT And Jim's comment that the near side of the Rille wall is -

END OF TAPE

CAPCOM Knew you could.
SCOTT And add to Jim's comment that the near side of the rear wall is smooth without any outcrops there by Saint George and the far side has got all sorts of debris. It almost looks like we could drive down in on this side, doesn't it?
CAPCOM Stand by on that, Dave.
SCOTT So we could drive back out.
SCOTT Oh, now -- I can turn around and look to the northwest-- with a real trench to the north. Let me concentrate on Elbow for the moment.
IRWIN Yeah, let's get to Elbow.
IRWIN (garble).
SCOTT Okay, the range estimate must have been off for ELBOW. On that it says 2.7. Joe said 32, I guess.
CAPCOM Our estimated Jim, was 3.1 from your landing site.
IRWIN I say that's right. That's a difference, yeah.
IRWIN Oh, this is really a sporty driving course. Man, oh man, what a grand prix this is.
IRWIN There's old ELBOW
SCOTT Is it? They're real fresh one down here.
IRWIN ELBOW is larger than that.
SCOTT Yeah, but there is a nice fresh one then.
IRWIN Yeah, but you want to go a little further east. See, that's ELBOW out at 11:30.
SCOTT Rog. Gosh, that's a long way away.
IRWIN Yeah. Distances are very deceiving.
In fact, we've been driving for an hour.
SCOTT Are you sure that's ELBOW, Jim?
IRWIN Yeah. Yeah, you want to go further east, Dave.
SCOTT Okay. Down this little crater. Back up.
IRWIN You have ELBOW out on our 1 o' clock position.
SCOTT Shoot, this is ELBOW right here, I believe, my friend.
IRWIN Yeah, this is ELBOW right here.
SCOTT Yeah.
IRWIN In those large ones.
SCOTT The one we're just trenching into.
IRWIN Yeah.
SCOTT And that's a big fellow, isn't it?
IRWIN Yeah, it sure is.
SCOTT I'll take a look up here and we'll see how she looks --
IRWIN Maybe you can -- you know, angle uphill here.
SCOTT Yeah. (garble). How are we doing on time, there,

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SCOTT Houston.
CAPCOM Like gangbusters, Dave and Jim. Continue
on and we'll give you the exact number in a minute.
SCOTT Okay, do we -- do we want to stop at ELBOW
or press on?
CAPCOM Stop. Follow the check list just as planned.
SCOTT Just as planned. Okay. Okay, let's go right up
on the ridge line there - I see some debris. Maybe we can get
some -- fresh one in the rim -- be look down from. Oh look at this
baby climb the hill.
IRWIN Yeah, climbing as the body clicks.
SCOTT Amen.
CAPCOM Now Jim, can you get an AMP reading for us
as you climb.
IRWIN Oh, sure.
IRWIN Yeah, reading -- oh it's just about - it's 10
on band one, Joe.
CAPCOM Roger.
IRWIN We got a good slope here about -- I'd say
10 degrees we're going up right now.
SCOTT Amen. (garble). Did you feel that?
IRWIN Okay, now we're up on the high part and
we're on the -- we're on the east rim -- east rim of ELBOW.
CAPCOM Stupendous.
SCOTT Okay, this ought to give the folks back home something
to look at right here.
IRWIN Okay, we're at our first stop. Okay, power's (garble)
down.
SCOTT And Joe, here's some readings for you.
CAPCOM Roger.
SCOTT 185 011 045 032 105 112 085 087 and Jim,
read the little -- lower limit on the motor temps. Both forward and
rear.
SCOTT Doesn't look like that gauge is operating.
CAPCOM Maybe they're still cool.
IRWIN Let's hope so.
SCOTT Okay, Joe. Give you FM TV here.
CAPCOM Roger.
SCOTT Okay, Joe. I gage pointed. And we've got a
fair good -- a fair amount of dust on the rover. Very light,
thin --
CAPCOM And Dave and Jim. We gained 20 minutes
back. We're making money, hand over fist on your driving.
SCOTT Okay, I see the camera coming up.
IRWIN Never got that Velcro on the gnomon bag fixed.
SCOTT Hey, Joe. Give me a COMM check on the
FM TV.
CAPCOM Okay, Dave. COMM check on FM TV and it's
16 millimeter off.

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SCOTT Okay, I'm taking a pan.
IRWIN Okay.
SCOTT Okay, Houston. (garble).
CAPCOM Dave and Jim, we lost COMM temporarily
here. Stand by.
SCOTT Houston, how do you read?
CAPCOM Dave, you're very broken and garbled.
CAPCOM Stand by one. We're working.
SCOTT Now we've lost COMM with them, Jim.
CAPCOM Okay, you're loud and clear now, Dave.
SCOTT Do a quick sample here and then press on.
IRWIN Yeah.
IRWIN Dave, I'd like to get the COMM back. You get
your pan?
CAPCOM Okay, we've got the COMM. You're loud
and clear now.
SCOTT Sample. Do you want a radio sample?
IRWIN Okay. I'll go back to FM TV and let them --
SCOTT Okay, a quick radio sample here.
IRWIN Yes. They'll find you one.
SCOTT Here Jim.
IRWIN Right over here's one.
IRWIN I kick (garble) dust all over - it's so easy. How
about that one right there? Do you think we can get that one in the
bag?
SCOTT Yeah.
CAPCOM Okay, Dave and Jim. This is Houston with
the voice check.
SCOTT Roger. (garble).

END OF TAPE

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SCOTT Okay.
IRWIN Got me a bag.
SCOTT Yeah.
CAPCOM Okay, Dave, Jim, Houston with a COMM check,
do you read. Over.
SCOTT Number 156.
CAPCOM Roger, copy 156.
SCOTT Wait.
IRWIN It's very pliable. Looks like a GARBLE all
right, quite friable but I see a lot of sparklers in there.
Angular with lots of dust on it.
CAPCOM Roger, Dave. Copy loud and clear. Continue
on and this is Houston with the COMM check.
SCOTT Yeah, it's a lot better now. I thought we lost
you there for a minute.
CAPCOM We are hearing every word loud and clear.
IRWIN Okay, I guess it was in your configuration
down there. Okay, we'll hop up here and get another one.
Okay, here's one, about the same size. You're a little
too big. Take this one right here Jimmer. Oh, I see a
large chunk in there.
SCOTT Get a little soil on this one, huh?
SCOTT Yeah, man. Got it.
IRWIN Yeah I got the down sun.
IRWIN Okay.
SCOTT With the location shot here. Okay, Joe these
are buried about an inch or so. The one I have is subangular,
covered with dust, but beneath the dust by golly it's a -
it's quite friable and I see olivine. Look at this Jim. In the
sunlight would you call that olivine and there is a big lap in there.
Look at the big lap about a centimeter long and a millimeter wide.
IRWIN Yeah.
SCOTT Pledge.
IRWIN Now, let me put this in your bag.
SCOTT Light grey millimeter size grains with like
two millimeter size cenocrysts in it. Gosh.
CAPCOM Roger, that's fairly straight. We copy you
loud and clear. We need a bag number for that.
SCOTT Bag number 157.
CAPCOM Roger.
IRWIN Let me get you another one. My goodness let's
get another one out of here.
SCOTT Okay. That one's really big.
IRWIN A little too big to go in there.
SCOTT Yeah.
IRWIN There's a little one.
SCOTT Okay, let me just stick it in.
IRWIN GARBLE
SCOTT Yeah, give me the bag.

IRWIN GARBLE.

SCOTT Dig a little light trench in there and we'll - I've got a feeling Dr. Schmitt is going to win his bet. not that part - get another part. Not where we picked the rock up, right in front of it. Okay, that's good. In that spot there.

IRWIN Whoo, boy. Okay, a little bit more.

SCOTT Okay, you just try it again. Get another one and just pour real smooth and I'll catch.

IRWIN Okay. At a boy. At a boy. Good show. Okay, that ought to be enough for them to take a look at.

SCOTT Okay 157. Oh, oh, good catch.

SPEAKR Got it?

SCOTT Okay, I got it.

IRWIN Get in there I'm going to get the picture.

SCOTT Get the picture, okay hop on out and get one more, and it's pretty sparse out here. Gosh we're only - not very far at all. I'm not sure that the ones down here aren't brought - I don't know that this is too representative of Elbow

IRWIN I don't think so either.

SCOTT Hey let's pick up a couple, one more anyway since we're out here. I see a little one. Got to be careful not to kick the dust all over them when you get there. Jim, I see sort of a miniature raindrop here it looks like.

IRWIN Yeah, just behind you is one of those fresh craters too with a lot of glass in it.

SCOTT Is it really?

IRWIN Yeah, right behind you.

SCOTT Okay, let's pick up these and get the radio done.

IRWIN My yoyo didn't cut it out here. My yoyo is broken. Broke my yoyo.

SCOTT I've got so much dust on my camera I can hardly see the camera setting.

IRWIN Okay, got a bag.

scott Yeah.

SCOTT Okay, Joe, I've got another subangular fragment here, rough surface texture and knock a little dust off of it and it looks like a very fine grained gray very solid frag. I don't see any significant pits or any significant size crystals in there. It might just be because the surface covering which is a smooth, fairly hard rock.

CAPCOM Roger, Dave, GARBLE.

SCOTT I don't see any pits on any of these. Most of them are about 1/5 buried. Okay, here is another one that's got - oh, what's on the underneath side of that - I hope I don't lose these tongs - on the underneath side of this frag Joe I can see some soil that is caked on the bottom, about 1 millimeter thick and maybe down in the place from

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SCOTT which I got it we could sample. Why don't we
got - I'll take a picture and you can scoop that.

CAPCOM Okay, Dave we copy. Good description. We'd like the
bag number from that and like for you to move out at your
next opportunity please.

SCOTT Okay, 158.

CAPCOM Got the sample scooped up.

SCOTT Yeah skip that. I've only got one hand now with
a broken yoyo.

IRWIN Wait, wait. Let me get a picture.

IRWIN Got it.

SCOTT Okay.

SCOTT Good boy. Good shot.

IRWIN Okay, if your yoyo is working could you roll
the bag up.

SCOTT Yeah.

IRWIN I'm going to have to hold on to these tongs
now, maybe it's a good idea we have two tongs after all.

IRWIN Yeah, if it is that fragile I'm wondering
about is it mine. Maybe you can use mine.

SCOTT No, that's all right.

IRWIN I can go better without it, just as well without
it. Okay, I'll put it in your bag. Going to go back to
rover.

SCOTT Okay, Joe, you want us to pass on up to
ST. George.

CAPCOM That's affirm guys. Move on.

IRWIN Okay, Dave.

SCOTT Okay. We're on our way. Oh, boy is this
traveling. It's a great sport, I'll tell you the sandpile
was never like this, yeah man. I wish we could just sit down
and play with the rocks for a while. Look at these things
they are shiny, sparkly. Look at all these babies here,
gosh.

IRWIN Oh, Dave. there will be be a lot of them. Let's
get back.

SCOTT Can't resist it.

END OF TAPE

SCOTT Can't resist it. We'll find something east of St. George.

SCOTT You got my belt on all the way?

IRWIN Yes.

SCOTT I tell you. Want me to attach it for you. Okay, lean forward so - Okay, I'll get the TV.

SCOTT Okay, Joe going PM lw B.

CAPCOM Roger, Dave.

SCOTT Let me get it for you.

IRWIN I can't get it -

SCOTT I'll get it.

SCOTT You are hooked.

CAPCOM Jim, could we have a heading reading as you climb on there?

IRWIN The heading's 185, Joe.

CAPCOM And sounds steady as a rock. Thank you.

SCOTT Oh, my. I just kicked up a hole here at the rim of this little crater. Seems to be all white, much lighter albedo.

IRWIN Golly, Dave.

SCOTT Hey hold my seatbelt, Jim, so I can hop in quicker.

IRWIN Okay

SCOTT That's right.

CAPCOM Okay, Dave and Jim. Standing by for a mark as you roll.

SCOTT Okay, stand by.

SCOTT Okay, Joe. The time consumer here is the seatbelt operation. Cause we definitely need them, and in 16g we don't compress the suits enough to be able to squish down and get the seatbelts locked without a certain amount of effort.

CAPCOM Roger. We understand.

SCOTT I'll tell you, it's a good seatbelt design - it's a great seatbelt design. Okay, let's check the drive enable. They're all on, drive power is on, steering forward to buss A, 15 volts dc. Ready to go, Jimmy?

IRWIN Ready.

SCOTT Okay, mark -

CAPCOM Dave, we want steering forward OFF.

SCOTT Oh, yeah, yeah. Okay.

CAPCOM And Dave and Jim as you drive away there. I was a little hasty on my time call. Mickeys big hand was actually over his head and we're running about 30 minutes down now, but we're still looking good.

SCOTT Okay.

IRWIN Okay, we're moving out again at about 7 feet clicks, getting now 180.

SCOTT We want about a 225.

IRWIN Yes. If we can just find -

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IRWIN As we drive along, there are several craters 3 to 5 meters in diameter. There's one out at - a rather large one out at 1:00 o'clock to us now. We have a heading of 215. It looks fairly recent - there are a lot of angular blocks on the rim of it.

CAPCOM Jim, let me interrupt a second here. Can you confirm that your dac is stopped?

IRWIN That what is stopped?

CAPCOM The 16 millimeter camera.

IRWIN Yes, it is stopped

CAPCOM Thank you.

IRWIN Okay, Joe - Be careful, you're on me. Boy that's a nice fresh one. There's the entry to it. Gosh. Bump. Sure hate to go by that one.

SCOTT Okay, if we don't find a better crater, that might be a better one to come by - you know?

IRWIN Yes.

SCOTT If we don't find a fresher one.

IRWIN Yes, that's the freshest we've seen - it's a great one.

CAPCOM Approximate size, Dave.

IRWIN Another fresh one over there at 11:00 o'clock.

SCOTT It's about 20-25 meters across and looks like it's excavated to bed rock and has a very blocky ejecta blanket and blocky rims and the ejecta blanket was about half way out and blocks on the order of about a foot and a half at the largest and some angular - some quad angular.

IRWIN Bet there's glass in the bottom of that one.

SCOTT Yes, there sure is. Yes, we're starting a slight upslope now.

CAPCOM Roger.

IRWIN As we approach the front.

SCOTT And what a beautiful view looking up that slope. And you can see the linaments come down and across there can't you? Going from - let's see, it's got to be northeast or southwest, huh?

IRWIN Okay, let's pick a - I should head up the slope here. It would be great if we could get up to that rather large - I think that's too far away, Dave.

SCOTT I do too. Man, this is getting - oh, look at these here, deep - subdued.

SCOTT Deep, but there's not much fresh ejecta around them.

IRWIN Nope. Man, steep slopes, that must be 30 degrees on the side. And a little old crater that couldn't be more than 10 meters across.

IRWIN We're heading for St. George, I think, huh?

IRWIN Yes.

IRWIN There are some blocks now that look like they're a foot angular blocks. They look like they're on the surface, Dave. Look over there at 11:30.

SCOTT Yes, they are. Most of them have been buried by this time and those seem to be - they're right on the surface for some reason.

IRWIN Oh, that antenna fell down.

SCOTT Hey, Joe, We're going uphill pretty good.

CAPCOM Roger, Dave. Copy. Your updated range at station 2 is about 3.9 clicks. And if you will park down sun, we'll give you a NAB update when you're coming back on.

SCOTT Allrighty. Yes, we're reading 38 right now.

CAPCOM Must be getting close.

SCOTT Got yah.

IRWIN That light colored one out there?

SCOTT Yes sir. That would be a good one. But it looks awful rough up there doesn't it?

IRWIN Probably further away, Dave then we have to go.

SCOTT Well, we'll just keep rushing along here.

IRWIN There's a large block - looks like about a 5 footer out at 1 o'clock - angular block.

SCOTT Yes, you're right.

IRWIN Why don't we go there. You can tell we're going uphill.

SCOTT Yes, speeds dropped down to 7 clicks.

SCOTT We can just go straight over that big one.

IRWIN Yes, that's what we'll do.

CAPCOM Sounds good to us. Any place that looks good to the 2 of you.

IRWIN Okay, we're going to a big block here, Joe. It's one that we just can't afford to miss - what it is to look at a big rock. We're going to look at a big rock. It's the only big rock I see anywhere.

SCOTT Yes.

SCOTT Hey, we can make it to that fresh one, can't we Jim?

IRWIN I know it, I know it, take it in.

IRWIN Okay, boy this one (garble)

SCOTT Yeah, look at that. What a view back in the rilles.

IRWIN Boy, there's almost a view right into that crater. Should stop short on them.

SCOTT Shall we stop here?

IRWIN I got to go down some, just a minute. I'm going to back up, just a tad. Okay, as far as we can -

CAPCOM And Jim, as you look back can you see the Rover tracks?

IRWIN Oh, stand by. Yes, we could, Joe. I saw them the last time we stopped.

CAPCOM Okay, good. Sounds like the old Hansel and Gretel trick will work.

IRWIN Yeah, man.

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SCOTT Yeah, man.
IRWIN Okay.
SCOTT (Garble) Jim; you can get off.
IRWIN I'll try and get off.
IRWIN Made it.
SCOTT Okay, Joe, I'm going to give you the NAV
update as soon as Jim gets off.
CAPCOM Roger.
IRWIN I was going to give it to him.
SCOTT Oh you give it to him.
IRWIN I'll give it to him.
SCOTT Good.
IRWIN Let me give him the TV.
IRWIN Okay, Joe, if you're ready to copy, here
we go. 280 017 055 039 105 110 090 090
SCOTT Oh me.
IRWIN You having trouble, too?
SCOTT Yeah, man.
SCOTT I'm moving.
SCOTT And motor temps are both off scale low.
oh, look back there, Jim. Look at that. Oh, look at that.
Isn't that something. We're up on a slope, Joe, and we're
looking back down into the valley and - -
IRWIN That's beautiful. That is spectacular!
SCOTT Get the antenna pointed here.
CAPCOM Okay, Jim, and could you give us a frame
count when you finish your pan and Dave, we'd like one from
you.
SCOTT Yes sir.
CAPCOM And if you're still near the rover, we
missed the heading and bearing.
IRWIN Roger to that Joe. I'll do it Dave.
IRWIN Okay, the heading is 270 and the bearing
is 017.
CAPCOM Roger, and if the rover's fairly level,
well we'll give you a NAV update later on.
SCOTT Jim, give me the readings of the rover.
Jim, give me the readings on the rover.
IRWIN Okay. Aw shoo.
IRWIN Okay the shadow is reading 1 to the right,
pitch is zero, and roll is 8 degrees right.
CAPCOM Okay, Jim, sounds good.
IRWIN Okay. Going to FM TV.
CAPCOM Roger.
IRWIN Man, you all ought to have a great view
this time.
SCOTT Okay, Jim let's go sample this rock --
CAPCOM I can hardly wait.
IRWIN Stay in here Dave.
SCOTT Okay, get your pan.
IRWIN This is unreal. The most beautiful thing
I've ever seen.

SCOTT And, we're walking uphill, too!

IRWIN Is that ever uphill!

IRWIN There is one boulder!

SCOTT Very angular; very rough surface texture; looks like it's partially - well it's got glass on one side of it with lots of bubbles and they're about a centimeter across and one quarter of it has got all this glass covering on it; seems like there's a linear fracture through one side; it almost looks like that might be a contact; it is within the rock. It looks like we have a - maybe a breccia on top of a crystalline rock. It's sort of covered with glass, I can't really tell, but I can see it. A definite linear feature through one side of it which is about a fifth, and the glass covers both sides of what I guess I'm calling a contact and there's also - parallel to that contact one surface, which is quite flat; only for about 8 inches or so. Looks like it's been chipped off. The boulder, itself, is on the order of about a meter across and a meter across and maybe a - gee it looks like a half meter thick or so. It's got a fillet up one side and the other side is in a shadow; I can't really tell whether - it doesn't look like it's filled. It's got a fillet on the down slope side and the upslope side is open and free, as a matter of fact, it looks like it's almost excavated beneath it.

IRWIN That's looks fairly recent doesn't it Dave?

SCOTT Yeah, it sure does.

SCOTT It sure does, and I can see underneath the upslope side, whereas on the downslope side, it's piled up.

IRWIN Boy that is really something. Hey, let's get some good pictures of that before we disturb it too much.

CAPCOM Roger Dave and Jim, you look crystal clear and we've got a beautiful pan of both you and boulder on the TV. And it probably is fresh; probably not older than 3-1/2 billion years.

SCOTT Can you imagine that, Joe? Here sits this rock and it's been here since before creatures were on the sea in our little Earth.

CAPCOM Well said Dave, we'll pass it along.

SCOTT Jim, I think we ought to check the dust on the lens of these cameras.

SCOTT And this has just got to be impressive.

IRWIN I'll go up top side here and photo the earth side of it.

SCOTT Did you get the (garble)

IRWIN Yeah.

SCOTT Okay. Now, I think to not disturb things too much, let's try the fillet first. I'll get you a bag. And then we'll corner the rock.

SCOTT Look. Stepping on a piece of glass right by the tongs. I'll remember that.

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IRWIN I'll bet you do.
SCOTT Yeah.
IRWIN See if I can get a bag out. Okay. 180.
SCOTT Roger. For the fillet material.
IRWIN I'll get the fillet right here.
SCOTT Hey, wait. Before you do, let me poke a
picture at it. Okay, go ahead.
IRWIN Little pieces of glass in there in some
places.
SCOTT Oh, I'm sorry Jim.
IRWIN Ohhhhh. I've got it.
BOTH Laughing.
SCOTT You know when you lean over downhill what
happens?
IRWIN Get some more.
SCOTT Yeah. Get some more.
SCOTT Okay. Now, let's get some typical soil
a couple of feet away.
IRWIN Okay.
SCOTT Hey, you know what we're going to do when
we get through with this thing, Joe? We're going to roll it
over and we're going to sample the soil beneath it.
IRWIN I'll take it right out here by the (garble).
SCOTT Yeah, good idea.
SCOTT Let's not disturb it.
IRWIN Okay.
CAPCOM That a boy Dave. That might fill a square
for the football size rock.
SCOTT Yeah. Sure would.
IRWIN Taking another one. If I can.
SCOTT Yeah, you can't see with my shadow there
very good, can you? Okay. Good. That a boy.

END OF TAPE

IRWIN Can't see for my shadow there very good, can you? Okay.

SCOTT That a boy.

SCOTT Okay, hang on to this one for a second.

IRWIN Okay, I got it. 181.

CAPCOM Roger, 181 and we have a view of the rille that is absolutely unearthy.

IRWIN Yeah, didn't we tell you.

SCOTT Give me your other bag Jim, I'll put it in.

IRWIN Glad you can enjoy it with us. Yes sir, Joe, tell me this isn't worth doing - boy.

SCOTT Okay, now we've got the fillet, we got the soil and now we need to sample the rock.

IRWIN Yeah.

SCOTT Let me get you - give me your hammer.

IRWIN Okay, I got it. Look at the vesicules in that rock.

SCOTT Those are glass bubbles.

IRWIN Glass bubbles, yeah.

SCOTT Okay, hey listen I want to get a closeup of that contact, hold on to this a second, okay? Let me get my trusty tongs, as a matter of fact, if you will pull the bag out Jim I'm going to get a quick selected sample here.

IRWIN Okay.

SCOTT I've got a little piece of glass right there. If I can get up the hill to it. Think I can put that in there? See that beauty. Oh, I'll hold the hammer. Okay, don't want to drop that one.

SCOTT How about that?

IRWIN Put in some soil

SCOTT I have some soil right there with the tongs it'll stay. It seems to be fairly cohesive here. Look at that. You can even dig a trench.

IRWIN Got my big chin.

CAPCOM And Dave and Jim you might want to get some material from the top and under the upslope edge of the boulder.

SCOTT All right we'll do that - we'll get it from under - well I'm going to roll the boulder over and I might even roll the boulder down the rille, Joe. I got a feeling here - we ought to do that.

IRWIN Okay, let's see we got those. Now let's - let me get a closeup. Hold the head.

SCOTT Is my lens too dirty to use?

IRWIN I don't see any dust on it at all, Dave.

SCOTT Okay, let's go ahead.

IRWIN Looks good.

SCOTT The top is -

IRWIN Yeah, I know, the top of mine is covered with dust too.

SCOTT Okay, we'll take Gary's little formula here. See if we can't get a picture of that contact. Nice close

SCOTT picture for him. Right there. Camber 10. Okay, go on the other side. Doesn't that look like a contact to you Jim?

IRWIN Yeah. It does.

SCOTT Okay, right exactly there. Okay, I think that will do it. Now your hammer. Let's see if we can't get - oh, let me take a couple of after pictures before -

IRWIN Do you want me to hold one of those?

SCOTT Yeah! Seal the sample in your bag. Good idea.

IRWIN Okay. After there.

IRWIN I'm going to fill it, and after there - (garble) around. Okay. Let's try the old hammer.

SCOTT Bring me a couple of bags here old buddy.

IRWIN Yeah. Standby.

SCOTT Damn.

IRWIN Got a good one?

SCOTT No. Pull hard.

IRWIN Ooh, is that hard.

SCOTT How underrated.

SCOTT You're knocking off some fragments. That's about the best you're going to be able to do.

IRWIN Ah, after all that instruction I got Dave I think up on top of you if you hit it it will break.

IRWIN Yeah, right here - there - yeah. Yeah, it's coming loose.

SCOTT There it is. I got it.

IRWIN That's it right there.

SCOTT Why that rock is really ready to roll.

IRWIN There it is.

SCOTT Yeah, good show. There's one - one down here - yeah it is - boy you ought to see the - oh, look at underneath the rock. We are going to roll it over and get some of that too. Underneath the rock is looks like either glass bubbles or vesicules. I can't tell which and it's in the shadow.

IRWIN Look at it Dave, got your eye on it?

SCOTT Yeah, I got it. Let me get one more watch it and I'll go up and get this one.

IRWIN Dark black, very fine grain basalt, by golly.

SCOTT You got your eye on that one. Well are you going to pick it up or maybe I'll get it.

IRWIN Here, let me get the tongs and let's get those two. I was hoping I could get a larger frag here.

IRWIN What I'm going to do.

SCOTT Okay, did you get it?

IRWIN Yeah. Okay, that's -

SCOTT How about the other one? I can get the other one too if you want.

IRWIN Yeah, where is it?
SCOTT Up - both - don't put them both in the same bag, let's separate the bags - here give me that bag. I'll fold the bag up and you get the other - well, here -
CAPCOM And Dave read a number off that bag.
SCOTT Yeah. 160. Is for the rock that's on - the chip off the corner uphill - I hope that makes some sense to you but when you get the pictures back - and it's the one that doesn't appear to have any beans in it. It just looked like a fine grained basalt, nonvesicular and the other one that Jim, are you getting it, here let me hold the bag for you.
IRWIN I'm not doing a dumbbell - dumbbell fragment there beside it. You didn't knock that off did you?
SCOTT The dumbbell frag beside it? Hold the bag here.
IRWIN Okay.
SCOTT No. I think that fell off chip. That looks like the same kind of stuff.
IRWIN This one right here.
SCOTT It fell off when I hit I guess.
IRWIN But I didn't see it fall off though.
SCOTT I didn't either but I don't think -
IRWIN It looks like a different type of rock.
irwin It sure does.
SCOTT I'm sure it was there when we started.
IRWIN Okay, let me just look at that one.
CAPCOM Okay Dave and Jim we'd like you to finish this sampling and press on with your comprehensive sample, please.
SCOTT Okay.
IRWIN Lots of glass on it, but can't tell the inside too well.
IRWIN Okay, what number is that?
SCOTT 161.
CAPCOM Roger.
SCOTT Frag on the top of the rock.
CAPCOM Roger, copy.
IRWIN Okay. Let me put the hammer back?
SCOTT If you want I'll go over and get the - we'll probably going to need the rake for the comprehensive -
IRWIN Yeah, why don't you go get the rake and let me - let's see I want to roll the rock over -
CAPCOM Okay, again, if you walk back there could you see if we have a TV cable hung up on the la cruise someplace? We are having trouble commanding the direction of the flight.
IRWIN Yeah, you do. I think the wire from the high gain antenna has got your cable to the TV.
SCOTT I'll get it.
CAPCOM Roger, could you give that unmanned vehicle a little help, please.
SCOTT Okay. Done.

END OF TAPE

SCOTT Okay, and roll it over. Okay, here.
Oh me, it looks like a bridge.
IRWIN It sure is, the top layer is a bridge.
SCOTT You can see it. There, babies over.
SCOTT Looks like tongs.
IRWIN Do you want me to bring the other tongs?
SCOTT No, I can get them.
SCOTT I may get them with the screw.
IRWIN Yea.
SCOTT A couple of pictures and we'll get some
of that material underneath the rock. Oh, there's a great big
glass bubble on that rock.
CAPCOM And Dave we're getting a local vertical
off the gnomes now.
SCOTT Here, Jim.
IRWIN Okay, I've got it.
SCOTT No no no, let me pick it up again.
CAPCOM As soon as you finish this sample we'd
like for you to turn on the comprehensive and we need frame
counts.
SCOTT Yea, we're starting. Jim get a scoop
of that underneath. Let me go around to the other side and
get a picture.
IRWIN The underneath portion there.
SCOTT Yea.
IRWIN Okay.
SCOTT Okay, I got the pictures.
IRWIN The bag.
SCOTT Okay, let me get it. 182.
IRWIN Looks like pristine material alright.
CAPCOM Roger.
IRWIN Okay, give me another one.
SCOTT (garble) i can't get down to you.
IRWIN Give me another scoop.
SCOTT If I can.
IRWIN Just kicked a little in there, but that's
alright. Okay. That's good shot. Okay, we're in business.
SCOTT Yea, why don't you.
SCOTT Meantime I'm going to configure here
for a comprehensive.
IRWIN Yea.
IRWIN Did you want to pick the site here.
SCOTT Yea, let me get the gnomes out here.
IRWIN Don't knock my scoop over. That's a
good place to put it.
SCOTT The bottom of the rock, Joe, it seems
to be gray where there's no surface alteration but there is
a surface covering, and at one portion there's some glass
and almost looks like slick inside the cross of glass and it's

SCOTT about 4 inches by 4 inches, and then there's oh my, one whole corner of that thing that's loaded with glass. That's just an unreal rock. Looks like a nice fresh place. Not but, here, right out here. Look good, smooth. Think you ought to be able to do some raking there. Good rake. Okay, I have a (garble) cross sight,

IRWIN Want it down some.

SCOTT Okay.

IRWIN Okay, I'm going to start to rake, Dave.

SCOTT Okay, have at it.

IRWIN Okay, there's one swat about a meter long. Help me pick this one. Flip off. I can hold that. Okay.

SCOTT Anything at all. (garble) if you can. You've got two little frags - better than nothing. Got a bag. It's number 186.

CAPCOM Roger.

SCOTT If I can get over there without falling down. Okay. Give another -

IRWIN Try another (garble)

SCOTT Yea, just keep going across in that direction then we're bound to get something.

SCOTT Joe, the soil is dark gray and it's fine grain and I haven't seen any difference in granularity between the LM and our position at all. It all looks about the same. It's fairly cohesive with very few fragments in it. Jim's getting about 3 or 4 with each scoop full, well 2 or 3.

CAPCOM Roger.

IRWIN I think our, take one more swat there.

SCOTT Man, we're really up high.

SCOTT Rolling smooth hills as far as you can see. And on the near side of the Rille as we go down to, are up to the north, why there seems to be quite a bit of debris whereas in our present position near St. George there is very little. It would be covered just with a down slope.

IRWIN Yea.

SCOTT Movement.

IRWIN Okay,

CAPCOM And Dave. We're hearing every word.

SCOTT Well we don't have much for all that raking.

IRWIN Okay, do you want another swat?

SCOTT Yea, let's take one more. That's about all I think we can do. It's just not that much in there. Boots go in about an inch or so when you press on them. Packs it down nice and smooth. Guess you can see the dust jumping up as we walk. At the bottom of the Rille over by, I would

SCOTT guess some where near the twins.
IRWIN Not a thing, Dave.
SCOTT Okay.
IRWIN Let me take one more.
SCOTT Near the twins I can see several very
large boulders. Very angular and I guess when I say large,
they must be 10 meters across. They are sort of unique in
the bottom of the Rille, and that particular area the other
ones look like they are half the size anyway. And there does
seem to be quite a bit of debris up there along where the twins
are. Up on the Rim.
IRWIN Okay, Dave. That one was a little
more fruitfull. I think about 5 or 6.
SCOTT Okay, let's call it quits there.
IRWIN Yea.
SCOTT And get some soil. Okay.
CAPCOM Dave and Jim, we're happy with this
comprehensive sample.
SCOTT Yea, okay. We'll press on to, we've
got documented samples. You want we'll pick up a double core.
CAPCOM Right on.
SCOTT Do you want soil with that comprehensive?
CAPCOM Roger, one bag soil with the comprehensive,
and then double core.
SCOTT Okay. Let me picture this here where
my big foot went. Okay I got it Jim. You can get your soil.
CAPCOM And Dave -

END OF TAPE

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SCOTT Okay. I got it, Jim. Did you get your soil.

CAPCOM And Dave, could we get a bag number for the bag.

SCOTT Okay. 187.

CAPCOM Thank you.

SCOTT It must be 186. I've got 187 for the soil.

CAPCOM Rog. Agreed.

SCOTT Get another one.

IRWIN Okay.

SCOTT Good show. Here's a bag; there's a bag. Okay. If you can hold on to this little one, I'll roll up the big one.

IRWIN Okay.

SCOTT Okay, the next thing on the agenda is a double core.

IRWIN Yeah. Okay, I'm going to go over to Crater for it.

SCOTT Okay.

SCOTT Hey, Joe, we've got a crater that looks sort of fresh, up here, oh a hundred meters or so, looks like with a fairly fresh rim. Would you like a double core on the rim of that or would you like us just to pull it right here?

CAPCOM Stand by.

SCOTT There's a change in albedo on the rim; looks much lighter.

CAPCOM Roger, Dave, drive the core right down through the rim.

SCOTT I thought you might say that. Okay. Take some of this stuff back and we'll have to walk up there.

IRWIN That won't take too long.

CAPCOM You were just checking up on us.

SCOTT Okay, Jim, you got everything you need? And I'll just come up there with you.

IRWIN Yeah. Come on up here and I'll get the cores up.

SCOTT Okay. Here we go. Head up for the crater. Think we can get there without any trouble?

IRWIN First one right here you mean?

SCOTT I figure that bright one.

IRWIN Oh, it'll probably take a good 5 minutes to get up there.

SCOTT Yeah, you're right.

SCOTT Jim, and that would be pushing it.

IRWIN Yep.

SCOTT Joe, I guess we'd take 5 minutes to get up there. What do you think?

CAPCOM Negative. Drive the core where else you think might be convenient.

SCOTT Oh, we've got a good place here. We've got a fairly deep crater; it must be about 10 meters across, a meter and a half or so deep, and we'll pick the rim of that

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SCOTT - there's a fresh impact crater here in the rim anyway, which looks like it fold out some.

IRWIN Let me get it.

SCOTT Is that a good enough place for you, Jim, right here?

IRWIN Sure is Dave.

SCOTT Okay.

IRWIN I wouldn't want to go up much farther on this slope. It's too hard to get up.

SCOTT It sure is isn't it?

IRWIN (garble) You aren't kicking too much.

SCOTT Okay. Let's give it a double core here. I bet we get a good double core.

SCOTT Hey, Jim.

IRWIN Huh?

SCOTT Oh, you can't - let me - why don't you turn around this way?

IRWIN Here, I'll - I was just going to (garble) up the cores. I was going to take a location shot.

SCOTT Oh, okay.

SCOTT I think you'll get location.

IRWIN Hold that for me while I get the cores out.

SCOTT Okay.

IRWIN Okay, Dave. If you'll hold - -

SCOTT Okay.

IRWIN - - the lower one while I get the upper one in (garble)

IRWIN (garble)

SCOTT Hey, Joe, the boulder we just sampled is the only one of its size anywhere to be seen. There's a fairly fresh crater up a little ways, maybe another half a kilometer or so, but - -

IRWIN Ring off will you Dave? We've got to screw that off.

IRWIN Save that part.

SCOTT (laughing) Yeah. They might want that, huh?

SCOTT Okay, here's your hammer in your left hand Jim. There you go.

SCOTT Get over here for photographing of this.

IRWIN Boy!

SCOTT Get on the other side, yeah.

IRWIN Do you push it in from the uphill side.

SCOTT Yeah.

CAPCOM And Dave and Jim, as you're getting a double core for us there, we'll be wanting to leave the station in about 10 to 15 minutes. We'd like only the big camera photograph following this, but I think we're in good shape on everything else.

SCOTT Okay, Joe. Is that as far as you can push it, Jim?

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IRWIN That's as far as I can push it. I've got
the picture; go ahead.
SCOTT Okay. It's a - we've got one full core,
the second core is going in about 2 inches per hammer stroke.
CAPCOM Roger.
SCOTT And we've got almost a second core. Got
another couple of inches to go, Jim.
SCOTT Doing good.
CAPCOM Jim, you're an iron man.
SCOTT Don't smash your finger.
IRWIN Ought to bomb this.
SCOTT Okay, that's good, men. It's all the way
in. Good show.
SCOTT Okay. Going to come up to the shell there.
I've got the picture.
SCOTT Okay. Pull it out very gently.
SCOTT Nice. Nice. He does it.
SCOTT That's nice. Coming out very clean. Looks
clean. Hold it steady. Got a good one. Okay. Come on over
this way with it. Cap for it. Oh, it looks like we have some
main (garble) Jim. Okay.
IRWIN Give me the cap. I'll put it on, Dave.
SCOTT Okay. Good idea.
SCOTT Okay. Better get back uphill.
SCOTT Oh, you're goint to ram it first. Rog.
SCOTT Let me put your hammer away.
SCOTT Okay.
IRWIN Ram her out.
SCOTT Okay, why don't you just hold it.
SCOTT Okay. Does it feel pretty hard?
IRWIN Yeah.
SCOTT Okay. Rammer went in about 6 inches.
SCOTT Okay.
IRWIN Here, hold this and I'll try to break the breccia.
I'll try to break it.
SCOTT That a boy. Easy does it.
CAPCOM And Dave, we're standing by for a number
on the core.
SCOTT Yeah, the top one is 03, Joe.
CAPCOM Roger.
IRWIN Oh.
SCOTT Don't lose the core!
IRWIN Move the core. There's the cap there. Can
you get it, Dave.
SCOTT Yeah, I'll get another one. Don't sweat
the caps; we've got beaucoup caps.
IRWIN Heck.
SCOTT Jim, I'll let you - - God bless it! Don't
lose the core!
IRWIN (garble)

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IRWIN You can hold this one and I'll put the cap
on the bottom one.

SCOTT They're new caps. You know they're a lot
harder to get on.

IRWIN (garble)

IRWIN Make sure all the numbers on.

SCOTT Yeah. I gave him the top one. I can't
see the two at the bottom's too dirty.

SCOTT Rub it off when you get going there.

CAPCOM No problem on the bottom one, Dave. We
know that.

IRWIN Okay, Dave. Let me give you this.

SCOTT I'll put this in your pack. You gotta ram it.

SCOTT None of that.

SCOTT And we've got some little goodies to do.
Okay turn right so I can get the rammer. Okay, it's rammed.
Okay. Maybe the core - you can put the one that you've got
in my pack.

IRWIN Okay. I'll try and recover those caps.

CAPCOM Yes, Jim, if you could with the tongs,
we'd like it back.

IRWIN Yeah. I'll try.

SCOTT Yeah, those new caps, Joe, with the metal
band on them will sure stay on a lot better - -

IRWIN Okay, got one (garble)

END OF TAPE

SCOTT (Garble) band on them would sure stay on a lot better.

IRWIN (garble).

SCOTT Can't even see them anywhere.

CAPCOM I can't understand you.

IRWIN They're right here, Dave. Bend right under here. I could see the edge of it.

SCOTT (garble)

IRWIN Yeah, I'll go get them. Just a minute.

SCOTT (garble)

IRWIN Oh, I dig in pretty deep.

CAPCOM And Jim, we'd like a stereo pan with your 70 millimeter scan. Maybe now is a good time to get it. Or, wherever you think is (garble).

IRWIN Okay. Look at his hands, Joe. You figure he could take a picture?

SCOTT Okay, partner, where are they?

IRWIN Right in here.

SCOTT Oh, yeah. You hold this up and put it on.

IRWIN Okay.

SCOTT Okay, I've got it.

IRWIN Okay, what number follows?

SCOTT Did you get the number of the other one?

IRWIN What number is that one?

SCOTT Three.

IRWIN Okay.

CAPCOM Roger.

IRWIN Know what the other one was?

SCOTT I can call Joe when we upload that.

IRWIN Okay.

SCOTT I can look it up.

CAPCOM Take it later. That's good.

IRWIN It's the little one in that -- that -- Dave's sample bag.

CAPCOM Roger. That's good enough.

IRWIN Okay. Hold this and let me put the core tube cap back.

SCOTT Okay, why don't you get your stereo pan and I'll get the big camera out.

IRWIN Boy, I just hope there's not any dust on the lens.

SCOTT Did my best, Jim. I just looked at it.

SCOTT Don't forget the rig in that other sample in the (garble).

IRWIN Yeah.

CAPCOM And Dave, we see you're carrying the -- the ignition key there for the rover.

SCOTT That's right. On that little blue bag.

SCOTT That gnomon is pretty dirty, unfortunately, Joe. There is just no way to keep that color chart clean with

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SCOTT all this dust.
CAPCOM Roger.
IRWIN Got to have a little moving base on that pass.
CAPCOM Roger, Jim. That will give us no problem.
IRWIN My picture isn't much good.
IRWIN Okay. I've dropped the lens cap.
CAPCOM Okay, Jim.
SCOTT Okay, Joe. I'm going to get you -- looks like I got some pretty good contrast looking up to the northwest. I'll give you the far side of the rille - the vertical and the horizontal. And I'll use a -- let's see --
CAPCOM Sounds good, Dave. And we'd like about 2 minutes worth of pictures and then think about leaving.
SCOTT Okay. How does 250 and a 8th look to you?
CAPCOM Sounds good.
SCOTT Okay.
SCOTT Okay, the first horizontal strip, Joe, is on the upper layer -- not layer. Upper region of the far side. I can't really see our ABCD that we thought we might see.
CAPCOM Roger.
SCOTT Okay, and then about one-third of the way down, there's a nice big very interesting outcrop over there which looks like vertical joining in a big block with the horizontal layer on the top. The block must be, oh, 2 per cent of the real height and it must be about the -- oh twice that across with the layer maybe one quarter of the height of the block and I got a 500 of that. I'll also take you a 500 vertical of the same area.
CAPCOM Roger, Dave. And we're interested in your climbing aboard now and start back towards the LM. We're going to eliminate station 3.
SCOTT Okay.
IRWIN The camera cut on Dave's camera is 54, Joe.
CAPCOM Thank you, Jim. Good call.
SCOTT And the camera count on the 500 is 61.
CAPCOM Roger.
IRWIN Maybe you can see mine, Dave.
SCOTT Yeah, I'll look.
IRWIN When you come over to strap me in -- maybe you can put these samples in.
SCOTT I will.
IRWIN My bag.
SCOTT I'll do that.
IRWIN Okay.
SCOTT Tidy the rover up. Ready for another little drive.
SCOTT Did you get your rake?

IRWIN Yeah.
SCOTT Okay, hop on.
SCOTT Up a little bit. That aboy. Now you're
in. That's a good position.
IRWIN Okay, let me get the bags and your bag.
SCOTT Another bag.
IRWIN Okay.
IRWIN That was closed. Belt
CAPCOM And Jim, while you're climbing in there,
what's your heading?
IRWIN Heading 270 -- 280, Joe.
CAPCOM Roger. It's rock steady.
SCOTT Okay, 115 on Jim's camera.
CAPCOM Roger, Dave. Thank you. And we suggest that you
just follow your navigation sytem home.
SCOTT That's a good idea. I was going to say we
might try that to see how she works.
CAPCOM That's exactly our thinking.
SCOTT Could be a problem finding home.
SCOTT (garble) here's a canon plug right down
there on the floor. Here let me --
IRWIN No, you can't do a thing. I have to get off
and unhook it from this canon plug down here.
SCOTT Hand your seatbelt to me. I'll hand it to
you when you get off.
CAPCOM And Dave, you're turning our TV off now again.
CAPCOM Dave, this is Houston. We assume you're
going to turn on our TV off shortly.
SCOTT Yes sir, yes sir?
SCOTT Thank you, Joe.
SCOTT Okay, Joe, you're drawing PM 1.

END OF TAPE

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IRWIN Okay Joe, we're going PM lwb.
CAPCOM Roger.
IRWIN Boy, there's dust here on the surface, isn't there?
SCOTT Yeah.
IRWIN Okay, buddy, ready to go? Okay, strapped in?
SCOTT Primary, steering to Delta, on the rear, nothing on the front. Ground power is on. Drive Enables are both squared away. Sun shadow device is stowed. And we're ready to go. Are you all strapped in?
SCOTT All strapped in. You did it.
IRWIN Okay, here we go rolling again. Okay, we'll try getting home on the NAV system here. Oh, look at that big fresh one in the side of the rim. Take that stereo pan right over there.
SCOTT Don't go downslope too much.
IRWIN I'm not, I'm going slow. I'll cut back over here. Easy does it.
SCOTT Looks like it takes us right back the way we came doesn't it?
IRWIN Yeah, that's the closest way. We're going to have to go to the right to go around elbow.
IRWIN Oh, yeah, I suggested we go left, but I guess we don't want to do that.
SCOTT I don't think we'd better try it. That's a neat place down into the rille though, isn't it?
CAPCOM Roger, Dave and Jim. We'd rather you do not take that option.
SCOTT Okay, if anybody comes back here, Joe, and wants to go down into the rille. Have them come talk to us cause there's a good place to do it here.
CAPCOM Roger. We'll suggest that.
IRWIN Okay, we're moving at about 5 clicks. And the slope - I'd guess just about 6 or 7 degrees going across slope.
SCOTT Wow wee.
IRWIN I'm going to go down this way. Yes, we better go down this way, the slope is not quite as steep.
SCOTT I didn't realize we'd gone up so high. Oh, look in back, man. We really climbed it.
IRWIN Okay, we're moving down slope now. Come back up here.
SCOTT Yeah, we know our tracks are to the right of us.
IRWIN Yes, we're in good shape.
SCOTT Heading right toward Mt. Hadley.
CAPCOM Roger, Dave. Any idea of whether you can see the LM or not?
SCOTT Well, Joe. I took a look when we were up there and I couldn't see it.
CAPCOM Roger. Sounds reasonable. And if you cross over Rover tracks, Dave, we'd like a depth estimation of them please.

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SCOTT Okay. I hope we do, Joe.
IRWIN Hang on. Oh, hang on.
CAPCOM Oh, mercy yes.
SCOTT Better go easy down hill, huh?
IRWIN I would say so.
CAPCOM it's uphill from here on in.
SCOTT That's what you think, Joe. There is a hill we have to climb here. You just - you can't go fast downhill in this thing because if you try and turn with the front wheels locked up like that they dig in and the rear end breaks away, and around to go and we just did a 180.
CAPCOM Dave. Tell Jim it must be that powdered material on the slope there.
SCOTT Yeah, we just did a cristy. Okay we're down. It's fairly level now. We're going to start up slope and we're on - just about on the south rim of Elbow.
CAPCOM Roger.
IRWIN What a ride.
CAPCOM Jim that's probably the first christy you've ever managed.
IRWIN Just sitting still huh? Okay, now we're going. Yeah, now we're up to 9 clicks, you have to swing to the right here, Dave, whenever you can, yeah. We want to get up on the ridge line here.
SCOTT Yeah, and also stay from up sun.
IRWIN Yeah. There now - now we're cooking. Up sun isn't too bad you know, though, there's a lot more definition than straight down sun. I don't think we will have any trouble driving up sun because the craters seem to show up pretty well.
SCOTT Have you noticed here on Elbow there seems like there is a very subtle bench on the southern side.
IRWIN Yeah, I kinda got the idea there were several subtle benches near the down slope particularly on the eastern wall.
SCOTT Yeah.
IRWIN Oh, there's a boulder we just crossed over a buried rounded boulder - it must have been a meter and a half across with - of course it's all gray - gets pretty rough up ahead, Dave.
SCOTT Yeah man. No kidding. Lots of debris. There are some rover tracks. How about that. Yeah here we are.
IRWIN Somebody else has been here.
SCOTT They really don't sink in very far. I'd say less than a half an inch, if that but they are here.
IRWIN They are here.
CAPCOM Roger.

IRWIN Maybe we can find a smoother way home.

SCOTT I'm going to do the NAV system here once we get squared away and get out of the hole. Incidentally, Joe, I don't think we saw any indication of flaws or a slide or anything coming off of Hadley Delta there. I didn't see anything that looked like a change in granularity or any subtle scarps of any sort. Did you notice any, Jim?

IRWIN No.

CAPCOM Roger. Dave. That's exactly the picture we built from your verbal description there and that's the reason - one of the reasons we're going to omit station 3. We think that there probably is not at least a sharp debris flow down the side.

SCOTT Yes, okay. I think that's a good decision. I don't think we're going much more over there than we've already found.

IRWIN Looking out to the east now, Dave, I see some very subtle ridges. I think they are ridges rather than craters. And it's probably - well it's out toward the secondary crater cluster - -

CAPCOM South cluster, Jim, sounds reasonable.

SCOTT Okay bearing 11 for a 3.3 kilometers. We see - - -

CAPCOM Right on.

SCOTT Hey, here's some foot prints, Jim.

IRWIN Ha, how about that.

SCOTT Hey, see that white albedo I kicked up over there.

IRWIN Yes. I sure wish we had more time to sample.

SCOTT I think I see the LM. I see some reflection over there, I think that's the LM.

IRWIN Sure is.

SCOTT See the reflection of it at 12 o'clock.

IRWIN Yes, we see it Joe.

SCOTT Sure do, and we're heading right straight for it, on a bearing of 11 degrees. Except for the wanders through the craters. I tell you Joe this is a super way to travel, nice and cool uphill without any strain. This is great.

CAPCOM Yes sir.

SCOTT And it's easy to drive, no problem at all. Just have to be careful because of the locked front wheels, but other than that very responsive. I can put the throttle right up to the stop or at some intermediate position, and take my hand off and rest my hand if I want to go left or right, I just put a little pressure until I get the angle I want and then let it off and we're center on the steering. It's really neat.

END OF TAPE

SCOTT put a little pressure until I get the angle I want and then let it off and we recenter on the steering it's really neat, even with the locked front wheels.

CAPCOM Sounds might smooth Dave. And we're still working on your front wheel problem. We may have them back before you know it.

SCOTT Okay, I'd like to try it that way too.

IRWIN Looking over to the east Dave I see a very large crater and it could very well be, could it be dune. It's probably too close to be dune. Maybe it's 54.

SCOTT Yea, it could be.

IRWIN I think it's 54.

SCOTT You see it.

IRWIN Yea. Good for you 54 is on the moon.

CAPCOM Alright.

SCOTT Hey, look at this rock. Hey you know, see that one on the surface there.

IRWIN No.

SCOTT I wouldn't be surprised if it came from that crater. Too bad we can't stop. There's a rock that was sort of rounded but had a rough surface texture to it of about a half a meter in size and it was about 10 meters down stream from a nice fresh crater that had a lot of angular debris in the bottom and the walls. There are a lot of little craters around here. Little being less than a meter, which are very rough, have a lot of debris right up to the rim and over the top side of the rim. No ejecta blanket to speak of, but the whole inside of the wall takes a half meter crater and it's filled with angular gray fragmental debris on the order of inch size or less. Very uniformly distributed, fairly well sorted. Like maybe they came, maybe the debris is from one of our Aristillus or Autolycus friends. And there is a lot of it so I think we'll have a chance to get it later on. They're rather shallow craters too. Let's say they're only about oh, 1 to 6. Hang on Jim.

IRWIN Yea, look, there's a large flat rock over at one o'clock.

SCOTT Yea.

IRWIN There several large rocks there.

SCOTT Yea.

IRWIN 5 feet in diameter.

SCOTT Right.

IRWIN Concentration in this one area and then there's a large one down in the pit of that subdued crater.

SCOTT How we doing on time there Houston.

CAPCOM Stand by.

IRWIN Oh look at that one, look at that one.

IRWIN It almost looked like (garble) didn't it.
SCOTT Did you see that one.
SCOTT How we doing on time, Joe.
CAPCOM Dave, you'll be about 20 minutes down
from the original plan when you get back to the LM. We're
not in bad shape at all. Looking real fine.
SCOTT Okay.
CAPCOM And we may be in better shape when you
arrive there.
SCOTT Okay, we'll see how we do. Oh hang
on buddy. Every once in a while, when one of the steering wheels
comes off the ground, due to bumping in a crater, we get a
side force why the rear end will break out, cause we've lost
our directional control.
IRWIN Dave, can you comment on the horizontal
bailing in Hadley. I'm looking out the split of Hadley,
that's Spur that comes up northwest.
SCOTT No, no, oh the lineations across there?
IRWIN Yea, the horizontal.
SCOTT Yea, there're 2 or 3 of them right in
the base. I didn't see those yesterday. It was all in the
shadow.
IRWIN Yea. Joe there's definitely A horizontal
pattern in the spur of Hadley.
SCOTT Oh, hang on.
IRWIN Just at the base.
CAPCOM Roger.
IRWIN And as you go above that and again, that's
maybe only 10, 15 percent of that particular exposure of the
spur, then there's a definitely linear pattern that looks
like it dips 30 degrees to the west. How come we stopped?
SCOTT I've got to put my seat belt on.
CAPCOM Dave, stand by for mark when you start.
Help us on our speed calculations.
SCOTT Yes, I'm sorry about that Joe, but
I'm pretty unstable without that seat belt and there's a lot
of feed back into the controller.
CAPCOM Yes sir, buckle up there.
SCOTT Anytime we stop Joe, I'll let you know.
I was going to tell you but your descriptions were so neat.
IRWIN Well it's nice to be able to see the LM.
SCOTT Yea, our bearing is right on.
IRWIN There's home.
CAPCOM Okay Jim and keep talking the description's
beautiful .

IRWIN We can see several craters on Hadley. It's hard to estimate what the size of them is, but the ones that I can resolve seem to be a fairly uniform size, as I can resolve from this distance.

CAPCOM Roger, understand.

SCOTT There's a rough area ahead.

SCOTT I'd like to see Rhysling on the way in.

IRWIN Yea.

CAPCOM Dave, are you moving again?

SCOTT Yea, we're moving.

CAPCOM Okay.

SCOTT You marked when we started Joe. That stop was, was maybe 15 seconds.

CAPCOM Roger, okay, thank you.

SCOTT And we're moving about 10 clicks.

SCOTT This large one ahead could be, not close enough yet to be Rhysling. Get this boulder here, Jim.

IRWIN (garble)

IRWIN Okay, we coming across either an elongate crater or 2 that are kind of joined up running east west, kind of a Doublet. We're going across the bridge between them, and it must be maybe 30 meters across on each one of them with no debris. They're smooth on the bottom.

CAPCOM Roger, Dave and Jim, and we've got them on the map.

IRWIN Hey great.

SCOTT Oh there's some vesicular basalt right there boy. Oh man. Just hold on 1 second, we've got to have -

IRWIN Okay, we're stopping.

SCOTT Let me get my seat belt.

CAPCOM Roger, mark that you stopped.

IRWIN Why don't you hand me your seat belt.

SCOTT Just a minute here. If I can find it. There it is. If you'll hang on to it here for a second.

IRWIN Okay, I've got it.

CAPCOM And, are you moving again?

IRWIN No, we're stopped here, Joe. I'll let you know when we move.

CAPCOM Roger.

IRWIN As for these small fresh craters that we've commented on, whatever caused them must create or underate the soil under the rocks needs it's own -

END OF TAPE

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SCOTT Whatever caused the - them, must create or indurate the soil into the rocks. Creates its own rocks. It will be just a concentration of rocks around the very fresh ones. The one I'm talking about, maybe a foot 3 feet diameter.

CAPCOM Rog, Jim. Sounds very possible.

IRWIN - - pressure.

IRWIN The key - - hand me my -

SCOTT Yeah, get it?

SCOTT Get it?

IRWIN Yes.

IRWIN Shoot, Dave. I think I dropped the map.
I did.

SCOTT Did you? Where's the 125 for EVA one.

IRWIN Right there by you?

SCOTT Yeah.

IRWIN Oh.

SCOTT Here, hold my seat belt.

SCOTT Do it?

IRWIN Yea.

SCOTT Dirty, dirty.

SCOTT The map's so dirty (garble). You can hardly
see her.

SCOTT I need to tighten this up a little bit.

IRWIN Need to tighten it up?

SCOTT Yeah, it keeps coming off. Make a lot better
time with it tight.

SCOTT Hold, maybe we should trade seats.

IRWIN Dave, see if you can hold it for me.

IRWIN Yeah, okay.

IRWIN Okay, Houston, mark. We're moving.

CAPCOM Roger, mark.

SCOTT There's a pretty fresh one right on ahead,
Jim. Looks like about 10 meters across and it's got up to
6 inch frags around the ream, maybe 15 20 percent of the
ream has frags in it but nothing -- no significant ejecta
like it which I think is typical of these around here.
That one looks like it's maybe a meter and a half deep;
I'll bet we can't get into it, I'll bet it has glass in it too.

IRWIN You know, you can almost tell the ones that
are going to have glass by looking at them before you get
there.

SCOTT That's right, you sure can. Yeah, we up
to about 11 or 12 clicks on that last burst.

CAPCOM Roger, Jim, I'm standing by for amps
reading.

IRWIN Roger.

SCOTT At any particular speed, Joe?

CAPCOM Give us anything.

SCOTT Okay, right now we're going at 10 clicks,
and I'm reading about 10 amps.
CAPCOM Roger, sounds consistent.
PAO Clicks equal kilometers per hour.
IRWIN -- on the motor temps.
CAPCOM Must be that smooth driver.
IRWIN Okay, we're on 1.7 so Rhysling should be near
Rhysling.
SCOTT Yes.
IRWIN In fact, we ought to be - Rhysling ought to
be off to our right.
SCOTT There's a pretty sharp one right there. It's
not big enough though.
PAO Ten clicks, or 10 kilometers.
SCOTT Reading 013 to the LM, and we're at 1.6.
-- Rhysling.
CAPCOM Okay, agree, Jim. It should be about a
125 meter crater.
SCOTT 12, min.
IRWIN Gee, I don't see it, do you?
SCOTT No, there's one over here at two o'clock
that's fairly deep and and light.
IRWIN It's deep, but it's not nearly that big.
SCOTT Not that large, no.
IRWIN Like 10 or 15 meters across.
IRWIN Havn't really seen any large enough that
we'd call Rhysling, Joe.
CAPCOM Okay, Jim, it may just be hidden by the
undulations.
SCOTT Yeah, it could be.
IRWIN And there are those.
PAO Current heart rate, 68 for the Commander;
75 for LMP.
IRWIN You know, I kinda get the impression, Dave,
we're going is almost like - well there's depressions and
then there's rises, and they're generally perpendicular
to our direction of travel.
SCOTT Yes, now that you mention it, you're right.
Sure does seem that way, doesn't it. We're just going up
and down the -- ha -- now watch your frequency, whoop,
watch out, hang on. Now that one, hang on - the next one.
Oh, oh.
IRWIN Like, just small valleys that are trimming
up slope, Joe. And we go down low enough so that we can't
see the LM any more.
SCOTT We'll see them until we get on top of the
next rise. They're very gentle valleys.
IRWIN And they're about, would you say, 60 or
70 meters across.
SCOTT Yea.

IRWIN You know, the terrain, looking from the east here, is just a general rise to the east. It looks like, oh, 2 or 3 percent. Notice that, Dave?

SCOTT Yes, up to --

IRWIN The base of the Apennines.

SCOTT And it's -- right up to the Swan Range there.

IRWIN Yeah.

SCOTT When we go out on EVA-2, why it'll be uphill going out, and probably downhill all the way back.

IRWIN That's nice. Whoop, there's a shocker. Boy, what a great suspension system this thing has. It'll be a tremendous view back to the LM when we get on to the Mod station on EVA-2.

SCOTT Rather than this being the plains, as such, I get the idea it's a kind of a base of a very gentle talus slope.

IRWIN Yes, that's right. We're not on a flat plain; it looks like it slopes down from the Swan Range over there into the rille, and then when you get to the rille rim, there's another slight break down to a sharp break. The slight break goes, maybe, 50, 60 meters and then you drop off steep into the rille. It doesn't look like we're in a basin so much, although if I look to the left, Jim, I can see a rise up to the rille.

SCOTT Well there might be a rise there at the rille.

SCOTT Yeah, yeah, rise at the rille. You're definitely right. We're traveling on a slope to the left right now. And boy, you really get that impression if you look east, look up sun.

IRWIN Yeah, you sure do.

SCOTT I can't believe we came over those mountains.

IRWIN Indeed we did.

SCOTT It's just a beautiful little valley.

IRWIN Those are pretty big mountains to fly over, aren't they. Here's a nice, subtle crater with a about 70 meters across, with a sharp, 15 meter one on the rim, with scattered debris out.

END OF TAPE

SCOTT (garble) with a sharp 15 meter in the rim which scattered debris up, but no big ejecta blanket, no rays. We can't see the LM now. And we're traveling at about 12 clicks.

SCOTT 018 degrees for .7, so right over the next rise we should see home plate.

IRWIN I think I see on the surface here linaments that are trending about northwest-southeast, Jim. Do you get that feeling? (garble) little linaments. As we go across here and if you think about them, if you look down there.

IRWIN Not convinced, Dave.

SCOTT Not convinced, huh?

SCOTT But right ahead of us where we're driving I see linaments that are parallel with our direction of - -

IRWIN Yeah?

SCOTT motion. That's right.

IRWIN I see those too.

SCOTT Whooo. Hang on. Oh brother. (laughter)

SCOTT There's the LM.

IRWIN Yeah.

SCOTT Came up over the rise Joe, and right when we got over the rise there was a great big crater in our path. But we missed it.

CAPCOM Got some bad news and some good news.

IRWIN Yeah, man. But it's the only game in town.

CAPCOM Don't you know.

SCOTT Oh, Joe, wish we could stop and pick up hundreds of rocks, there's so many. There's a little one sitting on the rim of a crater that's on a pedestal. It's a - looks like a smooth gray rock, sub angular, and it was sitting up on a pedestal, look like. Right on the very rim of the crater and it was the only frag near the crater.

SCOTT There's the old Falcon.

CAPCOM Dave, that sounds like a (garble) to me.

SCOTT The Falcon. Yeah. (laughter) Hey look the - would you think that the albedo's (garble) changed there where we landed.

IRWIN Sure is, it's lighter colored.

SCOTT Sure is. Is this called the Index over here to the right?

IRWIN Yes, uhuh. Yeah.

SCOTT Not very distinct is it. But it's Index. Our position is - we're just a little east then -

IRWIN Yeah.

SCOTT of our plan.

IRWIN I think they've got our - the position they've got picked out is pretty good.

SCOTT It's close, but looks like it might be a

SCOTT a little south.

IRWIN Yeah.

SCOTT Hey Joe, we're - our NAV system's starting to wander now. We got a range of .2 and a bearing of 34 and we're heading about 015 into the LM and it's just almost in front of us so, I think it's done very well though.

SCOTT Hey I think I almost landed in a crater, Jim. Look at the one on the right there. If I'd just gone down another - -

IRWIN Yeah, I have that on the map.

SCOTT Do you really?

IRWIN Yeah, it's just west - looks like it's just west, northwest of Index.

SCOTT Yes.

SCOTT Okay, come back here and we want to park it across toward the ALSEP side side. Okay, swing around. Yeah, it landed right in a little niche there, huh. No wonder. Just on the northwest rim of that crater.

IRWIN Yeah.

SCOTT I was hoping - I think I saw that big crater - I was hoping I might keep it like a foot per second forward all the way in and straddle something like that.

SCOTT Joe, we're back at the LM, by the way.

CAPCOM Okay, Dave, good news. Thank you.

SCOTT I'll park out here a little ways, Jim. There are a lot of glass fragments around here.

IRWIN Yeah.

SCOTT More than I've seen any other - -

SCOTT Yeah, that's Index over there and this is the one that's northwest of Index, gee that puts us - -

IRWIN You know what - -

SCOTT That puts us really at position D. Yeah, (garble) at the 7 755 and Baker Queen. Yeah, and you know I can see why now, I thought that was Salut, because Index is so subtle and there's another one that is just to the north of Salut, which I was going to call the landing site. Okay, we're parked.

CAPCOM Okay, Dave and Jim. You're certainly very close there and we can sort out the details of that later. Dave, when you turn on the TV, could you police the TV cables for us again, we think that we may be hung up again. And we need a status check on your - from both of your EMUs, please.

SCOTT Okay, Joe. (garble) do all that. Okay, here are the Rover readings. 315 059 103 001 100 107 95 and 95 and motor temps are both lower limit.

CAPCOM Roger, and that lower limit is okay.

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SCOTT Now my EMU (garble). Careful Jim. Go easy babe. Everything nice and easy now. Let me look at your camera. (garble) (garble)

SCOTT Get the brush on your RCU.

CAPCOM Okay, and while you're brushing it, Dave, we need a PLSS check.

SCOTT Rog. I got pipes are clear at 40 percent 3.85.

CAPCOM Sounds good.

SCOTT All right, Jim, let me get your - -

IRWIN Okay, I'm 385 on pressure flags are clear, and I'm reading 45 percent.

CAPCOM Okay.

SCOTT View camera so we can take those pictures (garble).

CAPCOM And, Dave, are you off the Rover at the front of the Rover now?

SCOTT Yeah, standby Joe. I'm going to get your cables and you're hung up all right.

CAPCOM Okay, thank you. And Jim as you unload the gear - -

END OF TAPE

IRWIN in the module, I'm going to get your cables and you're hung up all right.

CAPCOM Okay, thank you and, Jim, as you unload the gear from the PLSS's we'd like for you to put the spare core tube, core tube cap and SESC in bag 2 as you put bag 2 on the hand tool carrier.

IRWIN Okay, talk me through when I get around to that.

CAPCOM Sure will.

IRWIN Yeah, oh well, I parked the Rover wrong but that's all right, it'll work this way.

SCOTT Joe, do you want a reset on the nav system, or do you want to go ahead and pull a circuit breaker on that?

CAPCOM Pull the circuit breaker Dave.

SCOTT Okay, going to TV remote.

SCOTT Hey, Houston . . . with the attitude of the Rover I'm having a tough time finding the earth in this, in the field of view because of the sun shining in my eyes. This is only going to be a short stop, do you think you can do without it here?

CAPCOM We can certainly do without it, Dave. No problems

IRWIN On the offset.

CAPCOM Roger, and Jim, perhaps you could get back to (garble)

IRWIN What are you going to do to the UHT?

SCOTT Oh Boy, I don't know.

IRWIN You don't use the UHT that much.

SCOTT No, I'll think of something.

IRWIN Let's take that back in to the LM and maybe we can repair it.

SCOTT Yeah.

SCOTT Okay.

IRWIN Tell you what -

SCOTT Yeah, you want to open the gate.

IRWIN Okay.

SCOTT Here's a hammer, and the rammer.

IRWIN Okay.

SCOTT And the core tube caps.

IRWIN Okay.

SCOTT Got em?

IRWIN Okay.

SCOTT Your velcro is tidied. Another PLSS flap open. You can just bend over right there and get the bag.

IRWIN Okay.

SCOTT Here's a bag, want to hang on to it?
IRWIN Okay.
SCOTT Another velcro. Okay you're tidied.
IRWIN Okay, I have bag 4 here and I'll hang it temporarily on the right side, Joe.
CAPCOM Put it under the seat, Jim and get back 2 on the right side.
IRWIN Yeah, I'll be doing that. Bend over Dave.
SCOTT Okay.
IRWIN Tidy up. Okay.
SCOTT We want to put bag 4 under your seat.
IRWIN Yeah, I know it.
SCOTT Okay, I'll do it.
IRWIN I put bag 2 there. That's mine, I'll get it.
SCOTT Get it, you want to go ahead.
IRWIN Okay.
SCOTT Jim, I'm going over and open the SEQ bay doors.
IRWIN Okay.
CAPCOM And Jim, once again we want to transfer the core tube, its cap, and SESC, and the bag number 2.
SCOTT That didn't get done, Jim . . . Joe, I'll pick it up . . . remind me after I get the LR cube on the Rover, Joe, I'll do that.
CAPCOM Okay, fine Dave, no problem.
SCOTT Okay. The ALSEP is in a good place to get off.
IRWIN Yeah, you got a good attitude there. Yeah man.
SCOTT Yeah, I was thinking about that.
IRWIN Okay, the doors are coming open. Okay, the doors are open.
IRWIN Doors are open, boy its going to be hard to keep the dust off the ALSEP.
SCOTT Yeah, boy, you're not kidding.
IRWIN Yo, ho ho, out it came, (garble) you Dave.
SCOTT Okay.
IRWIN Yeah, easy (garble).
SCOTT Okay, here is a nice spot up here to set them down. That's right.
IRWIN (garble)
SCOTT Yeah, sure am.
IRWIN Pull that (garble) there.
SCOTT Pulled it. Okay.
PAO Television will be turned back on when they get to the ALSEP site. Sun angle is too close to the

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 124:04 CDT 12:39 356/3

PAO aiming point for the high gain antenna for the intermediate stop next to the LM. When the crew moves the Rover out to ALSEP site, they will realign the antenna and the TV picture will resume.

SCOTT Okay, give me one of those. If you can get them apart.

IRWIN (garbled) wedged in there like there before.

SCOTT Lot of surprises, got to expect surprises. Here maybe if I hold the fitting, rotate it.

IRWIN Can't.

SCOTT Never seen it wedged in there like either. There. Phew. Get one.

IRWIN You get one?

SCOTT Okay. (garble).

END OF TAPE

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SCOTT Whew! That isn't one.
IRWIN You got one.
SCOTT Okay. Okay (Garble).
IRWIN Straps do come handy for something, huh?
SCOTT Looks like it might work. Okay.
IRWIN Got it.
SCOTT Okay, and my package is a lot closer than
normal, Jim, so watch out when you back up. I want to move
it over.
SCOTT Okay, bar's on.
IRWIN Okay.
IRWIN Okay, Joe. I'm going over to pip, fuel cap.
CAPCOM Roger.
SCOTT I'm going up to the pallet to get the drill.
Drill first.
CAPCOM Roger.
SCOTT Okay, drill's out of the mesa.
SCOTT Okay, Joe I'm in a good position to handle
that core tube business, now if you want to run through it.
CAPCOM Okay, Dave, fine. Just want to empty all the
loose gear - the extra gear core tube and it's cap, and
SESC into bag number 2.
SCOTT Okay. The core tube and it's cap into bag
number 2. What loose gear - what are you talking about
used core tubes or new core tubes.
CAPCOM The new ones, Dave, the unused ones. And the
SESC that was on your collection bag and the core tubes that
were in your collection bag.
SCOTT Okay. The unused core tube, now goes into
bag number 2.
CAPCOM That's affirm.
SCOTT And the SESC that's on my pack comes out of
its pocket and it goes into bag number 2.
CAPCOM Right on.
SCOTT Okay.
SCOTT That other number on that core tube is 01, by
the way.
CAPCOM Roger, Dave. Thank you.
SCOTT Okay, Joe. I'm going for the LR cubed, now.
CAPCOM Okay, Dave and super clean.
SCOTT Super clean, yeah man. We'll do our level best.
IRWIN Okay, the RTG is go, Joe.
CAPCOM Roger, Jim. Thank you.
IRWIN The LR cubed is out.
IRWIN LR cubed is on the pallet.
CAPCOM And Dave - Jim just a reminder on those SEQ
bay doors if your getting ready to leave that area.
IRWIN It's to (Garble) I'm just about to close them.

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SCOTT He's not going to forget that, Joe.
IRWIN Booms are out a little farther than normal.
IRWIN I got to keep my LM cool.
SCOTT Okay, Jim, your seat belt is going to have to
get readjusted. Because I want to make sure I get the (Garble)
tied down good, here.
IRWIN Okay, SEQ bay doors are closed, Joe.
IRWIN Okay, our LR cubed and (Garble) are down on the
rover.
SCOTT Yes, we'll go out and find ourselves an ALSEP
site, I hope.
SCOTT You all set, Jim?
IRWIN Yes, Dave.
SCOTT Okay, go slow.
IRWIN Don't worry. I can't go fast carrying this.
SCOTT Yes, don't drop it.
CAPCOM Dave, this is Houston. When you climb on the
rover, I'd like a mark on that and I'd like to update you
with some further EVA planning that's going on down here
as you drive out to the ALSEP site.
IRWIN Okay, Joe. Stand by.
IRWIN I'm heading out, Dave.
SCOTT Okay.
IRWIN Okay - -

END OF TAPE

SCOTT Okay.

IRWIN Okay, Joe, on the rover. Heading to the ALSEP sight. Ready, mark.

CAPCOM Okay, Dave as you're moving out there, I guess I've got some good news and some bad news for you. Your O2 usage rate has been considerably higher than we've been planning on. It may cut the EVA a little short. We want you to be aware of this right now and we're watching it real close and we'll advise you in real time. No problem otherwise. It is good to note though that if you can do as little unnecessary moving around as possible, we may be able to run the EVA out to the full 7 hours, over.

SCOTT Okay, understand Joe. You know Joe, little moving around with the drill, that's sort of hard.

CAPCOM We know.

IRWIN Does that go for me too, Joe?

CAPCOM Jim, you're a little low, but not as low as Dave at the moment. You're in good shape. You're probably trying to get out of station 8 already.

SCOTT (laughter) Let's find a spot out here Jim, there's just no place that's really nice and smooth, and the zero phase sure doesn't help anything. I think I've got it. This is probably as good as we're going to do. Right about here. Jim, I'm going to turn right here and head north.

IRWIN Okay.

SCOTT That'll be pointing at you. Pointing at the central station.

IRWIN Good show.

SCOTT And it's gently rolling, but I think we're alright. Take it easy. No hurry. Let's see, I shouldn't have turned off that nav. it could have pointed north if I'd have had a nav. Okay Jim, walk up another 10 meters, and then come over towards me a little bit. Okay, right there looks like a good spot. Yea, that's good.

CAPCOM And Dave, you can put your shadow off the rover at about 9:30. It should work.

SCOTT Okay, Joe.

SCOTT I can't steer.

CAPCOM And Jim, you might want to take a short breather after carrying that heavy package.

IRWIN I'll go slow, Joe. I have the power package positioned.

SCOTT Okay. Okay, Joe, I'm parked and I'm a little, I'm going to be looking up sun. I can't seem to get it. Sure need that steerage. Okay, right there. There's so much dust on these checklist that you can't turn them.

IRWIN You can't read them either.

SCOTT That's a point. Okay, Joe do you need any readouts from the RRV?

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CAPCOM Negative, Dave. And we'll be standing
by for TV.
SCOTT You clipped, Joe, I didn't hear it.
CAPCOM Roger, negative on the readouts and
standing by for TV.
SCOTT Roger, it's coming up. Don't think
I'd come all the way out here and not let you guys see the
ALSEP deployment.
CAPCOM Wouldn't miss it for the world.
IRWIN Okay, Joe on the shorting switch, I'm
reading about point 8.
CAPCOM Roger.
SCOTT Joe, I might make a comment that it's
very difficult to find the earth in the field of view with
this sight glass even with the extension out on the thing. It
is just almost too dim. I'm having a tough time.
CAPCOM Okay, Dave thank you. Important information.
SCOTT Okay, going TV remote now.
IRWIN Okay, RTG table connected.
CAPCOM Thank you.
CAPCOM And Dave and Jim, we've got a beautiful
TV picture.
SCOTT Good. Okay, push to set so it won't fall
over. There. Hey, Jim, when you pick up the R&Q be
careful you don't knock her over. Okay (garble) are off.
Hey Jim, you make quite an albedo.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 12434 GET 1309 CDT 359/1

SCOTT Hey, Jim, you made quite albedo.
IRWIN Just what you've said to me.
SCOTT Do you want somethin?
IRWIN No. Don't want to get in your way here.
Want to get this thing out of your way. You need a little
break anyway, you're working hard. (Ha, ha) They both
really spring when they spring.
SCOTT Things really go when you throw them.
Okay, heat flow's connected.
CAPCOM Roger, we got it.
SCOTT Find me a couple of good spots out here.
Probe's in. Just about this direction will be best.
IRWIN Okay, the link on the side are deployed, Joe.
Sitting it down.
CAPCOM Roger, Jim.
IRWIN Okay, and I'm moving over to connect the
side cable to the central station.
CAPCOM Very fine.
IRWIN Got any more slack in that cable, Dave?
SCOTT Yeah, I'll put some more in it.
IRWIN I've got a boy bolt problem. Need a boy bull.
Got it. Down, down, stuck boy bolt, Joe.
SCOTT Never get those things apart without that
though.
IRWIN There we go.
SCOTT Jim, hook on slide cable not locking down
very well.
CAPCOM Dave, did the bolt come free?
SCOTT Yeah, I got it.
CAPCOM Jim, have you gotten that connection yet?
IRWIN Not very positive, I'm afraid, Joe. Try it
again.
CAPCOM Say it again, please.
IRWIN Shut it off. That'll pull right off - I'm
gonna work on it.
CAPCOM Jim, just make sure that the ear are pulled
back before you plug it in.
IRWIN Okay, 30 degrees north, 42 degrees to the
sun. That's -
SCOTT Ah, I got it, Joe.
IRWIN Ooh.
CAPCOM Outstanding.

END OF TAPE

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IRWIN Okay, central station is tipped down, Joe.
CAPCOM Thank you, Jim.
IRWIN Okay, taking the PSE stool out.
CAPCOM Roger, Jim.
IRWIN I take a little time to level things, today.
SCOTT Good.
IRWIN Well, my goodness.
IRWIN Things just aren't working too good.
IRWIN There.
SCOTT Hey, Joe. Heat flow is leveled and the shadow
is right between 2 and 3 on the index.
CAPCOM Sounds good. Thank you.
SCOTT I'll give you a demonstration here, Joe. Got
the TV on this pallet, here.
CAPCOM Roger. Right on.
SCOTT Here it goes.
SCOTT Beautiful, but I lost my balance.
CAPCOM Spectacular demonstration.
SCOTT Yeah, oh well. Enough of that.
IRWIN Lovely.
SCOTT another demonstration.
SCOTT Hey, Joe. I'm picking up the drill now.
CAPCOM Roger, Dave.
SCOTT It works.
CAPCOM Beautiful, and for goodness sakes hang on to
it, there. Don't throw it.
SCOTT Yeah man. You better believe.
CAPCOM What was that a demonstration of, by the way.
SCOTT I'm not sure I know.
CAPCOM It started out to be of gravity and it wound
up being of centrifugal force, I think.
SCOTT Yes, I think your right. Oh well.
SCOTT Okay, Joe the PSE is level and the shadow is
reading 091.
CAPCOM Roger.
SCOTT Okay, Joe. Drilling right go to the first
probe.
SCOTT The - bar on the right, today because the
rammer was packed in the one on the right, today.
CAPCOM Roger, Dave.
SCOTT Checks out, huh, Joe.
CAPCOM Checks out.
SCOTT Okay, I'm in a shallow depression here, Joe.
And there's no way of getting around it. There's just nothing
really flat. There's a little rim here, a little slight rise.
Further to the north maybe Mark would like it up there.
CAPCOM Dave, drill it there.
SCOTT Okay.

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CAPCOM Right where you stand.
SCOTT Thank you.
SCOTT Just checking, you know. Right

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 124:54 CDT 13:29 361/1

SCOTT Okay.
CAPCOM Right where you stand.
SCOTT Thank you. Okay. Just checking. You know.
Like sometimes those guys have some good ideas.
IRWIN Okay, Joe, on the Solar Wind. It's aligned
and door is open.
CAPCOM Thank you, Jim.
IRWIN Going to the LSM.
CAPCOM Righto.
SCOTT Okay, first two. And we go. Takes a little
bit of force. Matter of fact, it's getting a little stiffer.
In fact, it's getting a lot stiffer.
SCOTT Stuck down there.
CAPCOM Jim, you'll get your feedwater tone shortly.
IRWIN Okay, I did. Time to go to ox-water, huh?
CAPCOM It's about that time.
IRWIN Dave, can I disturb you to get my ox-water?
SCOTT Be glad to, Jim. Here.
SCOTT Oh, wait a minute. Okay, your ox-water
is on.
IRWIN Thank you.
IRWIN Okay, I'm taking the LSM out, Joe.
CAPCOM Okay, Jim, and mend divertor on your PLSS
please.
IRWIN That for startup?
CAPCOM That is affirm.
IRWIN Okay, mend. I understood it could start
up in any position. But you're trying to make me sweat a little.
IRWIN Uh, Joe, can you see the drill?
CAPCOM Yes sir, we sure can.
SCOTT Here I'll give you a better angle. That's
all I got.
CAPCOM We agree Dave.
SCOTT Put about 3 plugs in Joe and my goodness I
think that looks like about the end of it.
CAPCOM I have to argue that Dave.
SCOTT I guess the next question is do we dig a little
trench and lay them in a trench or do we just put 3 in.
CAPCOM Dave, this is Houston. We agree that if you
hit bottom there and think there's no way you'll go any deeper
just press on and put the probes in this hole.
SCOTT Okay, Joe. I'll give it one more try here,
see if I can get some more, but I tell you one thing, the base
at Hadley is firm.
CAPCOM Roger. So much for the fairy castle fairy.
SCOTT Yeah. I'm afraid that's it, I hate to say
that because it's working good.
CAPCOM Roger. There's a lot of information right there.

CAPCOM Jim, this is Houston. The divertor valve
is yours now.
IRWIN Okay, thank you, Joe.
CAPCOM You had a good clean start up.
IRWIN Okay, I'm on intermediate.
CAPCOM And, Jim, could you verify all your (garble)
are off.
IRWIN Verified.
CAPCOM Thank you.
SCOTT Joe, I can't seem to get the chuck to
reset, it won't go counter clockwise out of it's seat.
CAPCOM Dave, try to rotate it 90 degrees both ways
and then push sharply down.
SCOTT I know that Joe. It won't rotate 90 degrees
both ways. It'll only twist the stem. Maybe the drilling was
so tight for it it's locked up in there.
SCOTT It won't back off Joe. It turns the drill
and it'll turn the stem, but the chuck won't back off.
CAPCOM Roger. We copy, Dave. Maybe our stems
haven't been so bad.
SCOTT Any suggestions?
CAPCOM Dave, can you go either clockwise or
counterclockwise 90 degrees without the stem turning?
SCOTT Nope. Okay, Joe, the LSM is deployed, it's
level and aligned and I'm reading - the shadow is on the
first - -

END OF TAPE

IRWIN level, and aligned, and I'm reading the shadow is on the 1st degree on the plus side.

CAPCOM Okay, Jim, thank you, sounds good.

SCOTT Okay, Joe, I'll stand by for your suggestions.

CAPCOM Roger, Dave, take a breather.

CAPCOM Dave, this is Houston.

SCOTT Go ahead.

CAPCOM Roger, Dave, we're requesting you spend a few more minutes on this experiment. We want you to take the wrench off the Rover, it's on the rack, as you know, and try to hold the stem with the wrench and turn the drill off that way.

SCOTT Okay, I . . . guess you have to tell me where the wrench is on the Rover, Joe, I don't know of any wrench on the Rover.

CAPCOM The wrench on the hand tool carrier, Dave, on the rack . . . on the rack, I'm sorry, I'm giving you bad information here.

SCOTT Yeah, there's no wrench.

CAPCOM Dave, that wrench is on the rack that's holding the tubes, right along beside you. Sorry.

SCOTT The what?

IRWIN (garble) the bench I installed, not the wrench but the vice.

SCOTT Oh, the vice, yeah, why didn't you say the vice? Sure, sure, the vice.

IRWIN If that'll work, I don't know.

SCOTT I was thinking of a pipe wrench, you know.

IRWIN Yeah, that would probably be the thing to do.

CAPCOM And Dave, you are about a minute from a flag on your water.

SCOTT Okay, should I go to LOX now.

CAPCOM When you get the tone.

SCOTT Say again.

CAPCOM Roger, wait until you get the tone, just wanted to warn you.

SCOTT Okay, you're flipping your transmissions a little bit in the beginning sometimes, Joe, and miss it.

CAPCOM Okay, Dave, and if that doesn't work right off, we'll ask you to abandon that temporarily and go ahead and deploy the LRQ.

SCOTT It worked, it worked Joe. Good thinking back there in the back room.

CAPCOM And good working up there on the ALSEP.

SCOTT Okay (garble).

IRWIN You want me to get it, Dave.

SCOTT I can get it.

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SCOTT Okay, LOX water coming on. Going to be an end,
Joe?

CAPCOM Roger, Dave, thank you, End mend.

CAPCOM Okay, unmend.

IRWIN Got a malfunction over here on the sunshield
the cord broke. On those pins that have to come out to
release the aft sun shield.

CAPCOM Okay, Jim, we copy that, is that on the LSM?

IRWIN Oh no, it's on the central station, I guess
I'll have to get down on my hands and knees to get those
too.

CAPCOM Oh, Rog.

IRWIN Dave, I'll have to get dirty and get down.

SCOTT Can I help you?

IRWIN You might have to help me get back up.

SCOTT Okay, go.

IRWIN (garble) Sure wish I had a UHT. Oh, I made
it.

SCOTT Careful.

CAPCOM Jim, this is Houston.

IRWIN Go ahead, Joe.

CAPCOM Roger, Jim. We think that shorting switch
may have been inadvertently depressed. Could you take
a look at that for us, please.

IRWIN Sure will. Wish I could blow on it.

CAPCOM It won't work, I'll guarantee it.

IRWIN (garble) I just pulled the pin.

CAPCOM Roger, and Dave, the Diverter valve is yours.

SCOTT Thanks, Joe. It might have been inadvertently
depressed, Joe. Check it now.

CAPCOM Thank you Jim.

END OF TAPE

CAPCOM Jim, this is Houston.
IRWIN Go ahead.
CAPCOM Roger Jim, while you're working there, it looks like (garble) is still depressed. It doesn't really make any difference to us, but when it comes time to align the antenna you will have to be careful not to point the antenna at any of the experiment tables, over.
IRWIN Okay, remind me of that will you.
CAPCOM We'll be watching.
IRWIN When I get around to it.
IRWIN Okay, Joe, here comes the central station.
CAPCOM In living color.
SCOTT Okay, Joe, J5 on the first probe.
CAPCOM Roger Dave, thank you.
SCOTT And I'll go back and get the electronics box after I get this second one done.
IRWIN That sun shield works a little better here without a breeze blowing.
CAPCOM Yes sir. On with the solar wind. And Dave and Jim, the factor into your section here, we'll be asking you to leave the ALSEP site in about 15 minutes.
SCOTT Fine, okay Joe.
SCOTT It's even tougher here, Joe.
SCOTT Boy, that's really tough rock.
SCOTT Same problem. Okay I've got the same problem on the chuck, Houston. I think that the rock is so tough that the chuck bites into the core stem and just won't release it without that vice.
CAPCOM Roger Dave, we copy.
SCOTT And (laughter) I'm afraid I'm going to have trouble getting the vice off of this other piece here.
CAPCOM It looks like vice is a good word for it, Dave.
SCOTT I'm going to tell you, Joe. Oh boy.
CAPCOM Dave, let us suggest to you that you go ahead and deploy the LR cubed, and Jim, another reminder on your antenna.
IRWIN Okay, Joe, I'm putting that antenna up now and should not point it at any of the experiments, is that correct?
CAPCOM Just the experiment tables, Jim, is the thing to steer clear of.
IRWIN Okay, the antenna is up now. Try and level it.
CAPCOM Dave, this is Houston. I think maybe we want to worry about this a little later. Could you deploy the LR cubed for us please?

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SCOTT Sure will Joe, but let me put the second probe in. I got the vice off and all I've got to do is put the probe in. Okay?

CAPCOM Dave, we'd like for you to stand by on that probe. We think we may be able to drill it deeper later on; and let's ask you to go to the LR cubed now.

SCOTT Okay, on the way. I'll stick the probe in the rack, if that's alright.

CAPCOM Sounds good, Dave.

SCOTT Okay then, you want the drill in the sun I believe, don't you, Joe?

CAPCOM Rog, Dave. It looks good to us handle down battery away from sun. It looks good to us, and the LR cubed we want west and south of the rover, however far you think is convenient and super clean.

SCOTT Oh super clean, yes sir. Keep her clean.

IRWIN Okay Joe, Azimuth is put in and I'm working on elevation.

CAPCOM Okay, Jim.

IRWIN Okay, 3581 and 471, and the shadow -

END OF TAPE

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IRWIN Okay, 35 81 and 471. And the shadow device is good, it's leveled.

CAPCOM Okay, Jim.

IRWIN Okay, Joe, it's aligned and the shadow devices are on the index, and it's super clean.

CAPCOM You wouldn't be proud of anything less, Dave.

IRWIN Hope we're pointed south. Does that look all right to you? Okay, Joe, what would you like me to do with this cleanup part here?

CAPCOM Okay, Dave, you're not going to believe this but the drill has to be turned 180 degrees.

SCOTT Oh, I believe it. Okay. No problem. Knew we could get it fixed. Be a great core if we could drill one here, you know, you'd get some good hard stuff.

IRWIN Tell you, that time on that stem, Joe, I started hitting good hard, solid material like 8 to 10 inches down.

CAPCOM Jim, are you deploying the side now?

IRWIN Yes I am. Trying to.

CAPCOM Okay, we'll have to be leaving in about 5 minutes.

SCOTT Okay, Jim, I got your camera.

IRWIN How many pictures does that take?

SCOTT Takes about 20.

IRWIN Okay, get a 115 on your camera, we're okay.

CAPCOM Dave, are you picking up Jim's camera now?

SCOTT I've got Jim's camera; I'm going to take the pictures.

CAPCOM Roger. If yours is just as handy, it's got a color mag on it. In fact use whatever you want.

SCOTT I've been taking black and white.

IRWIN Okay, black and white.

SCOTT It shifted around so much there at the end, I lost track.

IRWIN Okay, Joe, the side is deployed. (Garble) here.

CAPCOM Roger, and, report the pin probe.

IRWIN I will. Pin is pulled.

CAPCOM Roger, and that's a new moon record on the side.

SCOTT Okay, Joe, I got the LR cubed pictures and it's still super clean.

IRWIN Okay, Joe, I'm gonna depress of the shorting switch even though you say it probably is.

CAPCOM Roger, that's good, Jim, depress the shorting switch and turn atro switch number 1 clockwise.

IRWIN Okay, it's depressed. Turn that switch number 1 clockwise. Okay, it's fully clockwise, Joe. Why not you try a transmitter turnon?

CAPCOM Roger.

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SCOTT Hey Joe, I mean Jim, when you take your
3-footers, are leaving the focus at 7?
IRWIN No, I'm coming down to -
SCOTT No, I'm leaving them at -
IRWIN No, I'm coming down to 3.
SCOTT Okay.
IRWIN No, I'm sorry, Dave, leave it at 11 .11 and
1/250.
SCOTT No, that's not what I'm asking.
IRWIN Oh, roger, I stopped it down at 3 feet,
focus at 3.
SCOTT Okay.
IRWIN Central station is --

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 125:34 CDT 1409 365/1

SCOTT Central station that's a unsteady base.
CAPCOM Okay, Dave and Jim. We want you to move back
towards the LM, now.
SCOTT Okay. Move out of the way and I'll get central
station here real quick.
IRWIN Did you get the LSM?
SCOTT Yes.
IRWIN Let me go over to put us the sunshield then.
SCOTT No, we got to start heading back.
IRWIN But it won't take but a second.
SCOTT Oh, yes that'll finish it up, yeah. Okay.
CAPCOM And Jim there's a ESP experiment over
240 000 miles.
IRWIN I'll read a thing.
IRWIN Okay the sun shield is up the LSM.
CAPCOM Okay guys, let's go back.
SCOTT Okay. Let's head back, Jim.
IRWIN Reached T right there.
SCOTT Hey, I'll get rid of this stuff.
IRWIN Okay.
CAPCOM Okay, Dave and Jim when you get back to the LM.
The name of the game is start your close out immediately.
SCOTT Okay, Joe. It'll be in work. Let's don't
fiddle with the seat belts. I'll drive slow.
IRWIN Okay.
SCOTT Make more time for that short distance.
CAPCOM And we're standing by for the TV to come on.
SCOTT Yes sir.
SCOTT Okay, and MWB.
CAPCOM Roger.
SCOTT Okay. I go in, okay on. On. Okay ready, Jim.
IRWIN Ready.
SCOTT Hold on to that - -
IRWIN Yes.
SCOTT - - handrail there.
SCOTT Make sure we don't get any dust on anything.
IRWIN Alright you've gone far enough.
SCOTT Say again.
IRWIN (Garble) a good ways.
SCOTT Don't want to get it dusty.
CAPCOM Dave and Jim we want you to pick up at 6 plus
28 minutes on your checklist and Dave your choice on the TV.
SCOTT Okay.
IRWIN On the contents of bag number 1, Joe. I got -
there not full. We have core stems in there.
SCOTT I'm reading you Jim. I guess he's not.
CAPCOM Jim, stand by on that. I'm reading you loud
and clear trying to get a reading. Stand by.

IRWIN I'm wondering, you know, if it's not full maybe we ought to take all the samples we have and put in SRC in bag number 1 so it'll go in SRC number 1.

SCOTT Okay, let's see. We want to report a check.

IRWIN Do that little building all time.

SCOTT Heading northwest, right.

IRWIN Heading north.

SCOTT In the sunlight.

IRWIN (Garble).

SCOTT (Garble).

IRWIN Feel like rover read outs when we stop, Joe.

CAPCOM Jim, when you get to the LM we think maybe if you think it is easy just dump the contents of all your collection bags in collection bag 1 and put the whole thing in SRC.

IRWIN Yes, sounds good.

CAPCOM Roger, if that's what your asking and the core tubes - the full core tubes, you can just leave there in collection bag 1.

IRWIN Okay, and we'll take the empty one out.

SCOTT Okay, Jim. Let's stop and why don't you hop off and let me back up here and give you the word.

SCOTT Easy does it, easy does it. Got to get rid of that tool that's in your way.

IRWIN (Garble) on up. Okay your clear to back up, Dave.

SCOTT Okay.

IRWIN Bring it up about another 5 feet.

SCOTT Okay.

IRWIN That's good right there.

CAPCOM And Jim. Be advised that that empty core tube was taken out of bag 1. You don't have to worry about that.

IRWIN Okay. Heading is 315 bearing 059 103 001 100

110 100 100 and motor dumps are still off egg low.

CAPCOM Copy.

IRWIN Hit the circuit breakers.

CAPCOM Roger.

IRWIN Okay, Joe you say pick up at 628.

CAPCOM Yes sir.

SCOTT 628, okay. I think we'll skip the TV here and get the rest of these things done.

CAPCOM Sounds good.

SCOTT Think we're going to have to do some dusting before we go in and it's going to take us a little long. I'll get those, Jim.

IRWIN Okay. Get that last one. My fingers just can't take it.

SCOTT Yes, I'll get it.

IRWIN (Garble).

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SCOTT Okay.
SCOTT You got to pull those.
IRWIN I'm the one that pulls those, yes.
SCOTT You just pull those 4, right.
IRWIN Yes.
SCOTT Okay, Rover's down.
IRWIN Okay, Joe. I'm checking the contents of SRC
number - or a bag number 1.
CAPCOM Okay, Jim.
IRWIN Let's see. Bag number 2 looks like all the
contents, there, we leave here.
CAPCOM Roger.
IRWIN Get the bag under the seat or the samples under
the seat.
CAPCOM Okay, Dave, and anytime between now and ingress
we'd like you to max cooling for 1 minute.
SCOTT Really, okay.
CAPCOM Rog, we think you can use it and it'll give us
good data for later.
SCOTT Look over here.

END OF TAPE

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SCOTT Go ahead.
SCOTT Okay, Joe.
SCOTT Okay, Joe, took all the samples out of bag 4,
put in SR bag number 1.
CAPCOM Okay.
SCOTT Now I'm going to put bag 1 in the SRC.
CAPCOM Thataboy.
SCOTT If it'll fit.
SCOTT Okay, Joe into the ETB goes CDR's camera
and mags November with 76 frames.
CAPCOM Roger.
SCOTT Hey, Joe. I need a roger out of that so
I know.
CAPCOM Roger. Sounds good.
SCOTT Okay. LMP camera mag Lima 119 frames.
CAPCOM Roger.
SCOTT Hey, Joe. The unused mags, I guess we
want to take them back in.
CAPCOM That's affirm.
SCOTT Delta and Echo coming in.
CAPCOM Roger.
SCOTT Kilo coming in. Oboe coming in.
CAPCOM Roger.
SCOTT Boy that seal was really difficult to get on
this SRC. Really difficult. I need a hammer.
CAPCOM Jim, did you take the protective cover off
the seal?
SCOTT Yeah, I did, Joe.
SCOTT Mag Metro with 62 - 61 frames.
CAPCOM Roger.
SCOTT Okay, let's see Joe. We don't have any
other bags to take up, do we?
CAPCOM That's affirm. You read it correctly.
SCOTT Although we do have one large rock here
that we might as well carry up. But it (garble)
CAPCOM Sounds good.
SCOTT Easy does it.
CAPCOM And Dave, we need maps yet and Charlie
Charlie off the DAC.
SCOTT Okay, I'm just waiting for Jim to move out
of the way.
CAPCOM Roger, while you're waiting we need the
LRV batt covers open.
SCOTT Okay, Joe. Let me get to those in a
minute here.
CAPCOM Okay, no hurry. Doing fine.
SCOTT Got the maps.

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SCOTT And the mesa covers are tidied.
CAPCOM Okay.
SCOTT Oh boy. Did you know you had a camera jam
on that Jim?
IRWIN No.
SCOTT The film jammed in the mag and stripped the
threads in the film. Mag Charlie, you got a nothing on
Charlie. Let's go - move. Charlie's in the ETB.
CAPCOM Okay Dave. We'll get it next time, no
problem.
SCOTT Okay, I'm going max cooling, Joe, you can give
me a MARK.
CAPCOM Roger. MARK.
SCOTT Okay. Call me when you get your minute.
CAPCOM I'll do it.
IRWIN Okay, Dave I'm ready to clean you.
SCOTT Oh, okay. Think that's possible. Here's
the brush.
CAPCOM Jim, while you're brushing there, did you
get the seal made on the SRC?
IRWIN Yes I did, Joe.
CAPCOM Good show.
SCOTT Okay, Joe, there's quite a bit of dust on
the mirror on the LCRU. Matter of fact there's quite a bit
of dust all over the Rover. It's very fine dust, do you
want us to maybe brush that off?
CAPCOM Dave, maybe a token effort, but don't take
too long, it doesn't sound too serious to us.
SCOTT Okay. That's right there.
SCOTT If we can get it off out here, the less
we'll have to put up with in there.
SCOTT That's really dirt. Are you dirty
yourself - -
CAPCOM Okay, Dave. Go back to whatever cooling
you want.
SCOTT Okay, standby. Put that brush away. I'll put
it away. How about dusting off the mirror there. Go ahead.
IRWIN Get your antenna?
SCOTT Yeah. What's left of it. Remember when
you go in that my ACA controller mount is the thing you're
hanging up on. You sort of have to go easy and get down past
that till you see inside.
IRWIN Okay.
SCOTT Okay, I'm back to intermediate Joe.
CAPCOM Roger, Dave.
SCOTT You want both LRV battery covers open. Is
that correct?

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CAPCOM That's affirm.
SCOTT Okay.
SCOTT There's one open.
SCOTT Stay open. There. Oooh me. They're open.
SCOTT How you doing, Jim?
IRWIN Good.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 125:54 CDT 14:29 367/1

SCOTT How are you doing Jim?
IRWIN Good. I'm in, Dave.
SCOTT Good boy. Where are you out there?
IRWIN Right in the Rover.
SCOTT Okay, because I've got a pallet here that should come out, I'll put it on the porch.
SCOTT Okay, I can dump it when I get there.
CAPCOM Okay, Dave. Jim, take a breather, if you would, please, and Dave, you're getting a . . . a LCRU blankets at 35% open at the same time, I'm sure.
SCOTT Don't. . . let me just check on the outer check list, will you, Joe.
CAPCOM Rog, rog, no problem.
CAPCOM Jim, did you carry the SRC up into the LM with you?
IRWIN Yes, I did Joe.
CAPCOM Good show.
SCOTT Hey, Jim, I got something for you.
IRWIN Oh, great, now take the pallet.
CAPCOM Don't tell me Davey, let me guess.
SCOTT Say again.
CAPCOM Roger, don't tell me, let me guess what that was.
SCOTT No, you'd never guess, Joe.
IRWIN Okay, Joe, I'm going to power down the LTR, the LTRU now.
CAPCOM Jim, we want you to just take a breather there, we're in good shape, just take it easy a sec.
IRWIN Okay, there's nothing else . . . okay, LCRU power switch is off, LCRU blankets are 35% open, that means 65% closed.
CAPCOM Or thereabouts.
SCOTT Okay, Joe, I'm ready to hop in. Do you have anything else you need done out here?
CAPCOM Dave, we are real good on the time, if you'll just stand by a second. You'll carry the ETB up with you, I guess.
SCOTT Yes Sir, I have it in my hand right now.
CAPCOM Dave, we are in such good shape on the time, we'd like for you to deploy the solar wind.
IRWIN (Laughter) Gee, I should have done that, Dave, before I came up.
SCOTT Okay, Joe, I'll give it a try. It's been like two years since I've done it, but I'll give it a try.
CAPCOM Okay, Dave, I'll tell you what, let's stand by on that, we'll have plenty of time next EVA. No problem.
SCOTT Well, okay. I . . . I can do it, I think, I

SCOTT used to do it back on 12. - - these days can everybody . .

CAPCOM Dave, dealer's choice.

SCOTT Well, is there something else I can do for you, like gather up some rocks.

CAPCOM Dave, I guess we don't have anything else for you right now. Its been an outstanding EVA here, why don't you go ahead and get in at your leisure. You might want to pick up that glass rock on your way in.

SCOTT Okay, hey Jim, can you see me out the window? Hey Jim?

IRWIN Yeah, I'm looking for you, you weren't in the left window, are you in the right window?

SCOTT Yes. Talk me through the solar wind, lets get it up, that . . they really need lots of data, we can give them lots of data.

IRWIN Okay, just take it out there about 50 feet.

SCOTT Okay. Right about here, huh?

IRWIN Farther, if you want.

SCOTT Yeah.

IRWIN And just pull the tube out, pull the extension, careful when you get to the end, a little thing popped off the end.

SCOTT Okay.

IRWIN Just pull it on out, careful when you rotate the screen, that you rotate in the right direction, so its doesn't pop off.

SCOTT Did it . . the . .

IRWIN Extend the tube, double sections, make sure they are in the red, indicating it's locked.

SCOTT Okay, red, red, red.

IRWIN Keep pulling.

SCOTT Okay.

IRWIN And pull that . . yeah, pull that out.

SCOTT Oh yeah.

IRWIN Be careful you rotate in the right direction, so it doesn't drop off.

SCOTT Want to rotate it against the opening, right?

IRWIN Right.

SCOTT Like that. Okay, that's easy enough to do.

IRWIN Okay, and then put out that there and pull it down, make sure you get the . . not the wire, but the bottom of the screen over the loop.

SCOTT Okay, I see that. Okay the bottom of the screen is over the loop. It says "Sun", I guess that means that side faces to the sun, doesn't it?

IRWIN Right, isn't that a neat experiment?

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SCOTT Yeah, that's the kind of experiment I like. Okay, we're out here at good distance where it won't get any dust on it from the Rover. Turn it into the sun here, stick it into the ground. Get a core tube. There. Okay Joe, solar wind is deployed.

CAPCOM Beautiful, ingress the Falcon, please.

SCOTT Rog. Yes sir.

SCOTT I couldn't resist this one, Jim.

IRWIN Is that the glass one?

SCOTT Oh, look at what I got, you wouldn't believe it.

IRWIN Okay, pick up the ETB and we got the LAC that we should stow out on the porch.

SCOTT Okay.

SCOTT Oh, we don't need the LAC, Oh yeah, you mean the LAC up there.

IRWIN Yeah.

SCOTT Yeah, okay. Okay. Oh I like 1/6th G.

SCOTT Okay, here's the ETB. How about handling that with care, there's a piece of fragile in there. I'll get it to you.

IRWIN Grab it here?

SCOTT Good, real easy with it, so we don't get the velvet stuff dirty. And the LAC.

IRWIN Don't forget your antenna.

SCOTT Yes sir, got it here. Let me hand up the LAC, here. Okay, I got hung up, okay, get my antenna.

IRWIN I got it over a little more. Give me a little more, just hold it right there.

END OF TAPE

IRWIN give me a little more. Okay, just hold
it right there. Okay, your antenna is stowed.
SCOTT Okay come back in here and then take a
dive. And then load slow.
IRWIN Yea. Got it made.
SCOTT Can you (garble) on link.
IRWIN Yea.
SCOTT It's not up far enough.
IRWIN Okay, I'm kind of caught up on you,
Dave. Let me move back.
SCOTT Oh okay.
IRWIN Okay, now you're clear.
SCOTT There you are.
IRWIN Okay close, prime water closed.
SCOTT Wait a minute. I'm not ready to do
anything yet. Let me turn around. Joe, do you read us?
CAPCOM Loud and clear, loud and clear.
SCOTT Okay, prime water close, huh. If I
can find it.
IRWIN Want me to get it for you?
SCOTT Okay, prime water is closed.
IRWIN Is yours.
SCOTT I got mine.
IRWIN Roger, mine.
IRWIN Can you get it?
SCOTT I'll do it for you. Okay, turn around
to the right here. I mean left. Okay. Okay, I've got it
prime and tone.
IRWIN The PLSS seems to have shifted. That's
the problem. It seems like it's riding a lot higher.
SCOTT Yea, way, way. No wonder you can't get those
things.
IRWIN Put your cott up in here. Take the
corner of that shelf.
SCOTT I've got it. Okay. Prime water's closed.
CAPCOM Jim, you should be in disconnect on
your suit iso valve.
IRWIN I am Joe.
SCOTT Stay right there, can you Jim.
IRWIN Yea, I'm getting back in the corner.
SCOTT Okay, hatches are closed and locked.
There, let me move that out of the way for you, wait. Ain't
no room in here. Okay, there, can you get to the dump valve?
SCOTT To auto.
IRWIN Okay, dump valve to auto.
SCOTT Okay. Now the next thing is plus 02
and press (garble) may come on during repress. Plus 02 and

SCOTT 10 percent manual control, control -
Okay, I've got about 10 percent. Why don't you go cabin
repress to auto.

IRWIN Cabin repress going to auto. Getting
what was the first one.

SCOTT Say again.

IRWIN How about the circuit breaker.

SCOTT Wait a minute. Do you have cabin
repress in auto?

IRWIN Yea. GB16ECS cabin repress closed.

SCOTT Let me get around further. Nothing I
can see, but me.

IRWIN Okay, cabin repress.

SCOTT There she goes. (garble). 1.5 2.0
Okay you can do it. (garble) 602 (garble)

SCOTT Okay, my plss 02 is off, and warning
light off. Hey air point cabin pressure stable at 46 to 5 and
it looks like it's 45 and stable.

IRWIN Okay.

SCOTT Purge valve to depress, DB configuration,
Okay, CB16 ECS suit fan 2 closed.

IRWIN Suit fan 2 coming. I didn't read.
Where are we, Dave? I can't read you.

SCOTT Right here, CB16 ECS suit fan number
2 closed.

IRWIN Okay, closed.

SCOTT Suit fan Delta-P closed.

IRWIN Closed. Okay, get some lights up here so we
can see what we're working on.

SCOTT Okay, ECS (garble) component lights
are out.

IRWIN (garble)

SCOTT Still on the compound. Boy that's
a nice idea.

CAPCOM Jim, your suit isolation valve still
shows connect down here.

IRWIN Okay, it's in suit disconnect up here
Jim.

CAPCOM Good enough Jim, thank you.

IRWIN Dave could you -

SCOTT What, what do you need?

IRWIN Could you get my gloves. My fingers are
so sore.

SCOTT Mine are too.

IRWIN Wonder why.

SCOTT There you go.

END OF TAPE

PAO This - -
IRWIN Put up the old helmet bag.
SCOTT Funny smell here.
IRWIN Yes, I think that's a lunar dirt smell. Never smelled lunar dirt before, but we got most of it right here with us.
IRWIN Okay, drop helmets with visors lower shades stored helmet bags verify safety on the dump valve.
SCOTT Jim, (garble).
IRWIN Can you get that.
IRWIN Okay. (Garble).
SCOTT A descent water valve open.
IRWIN Descent water open..
SCOTT Okay. Now remove purge valves and stow the purse. Uh oh, the purse fell down.
IRWIN I took it down, Dave. I thought that was the thing that was hanging up on (Garble).
SCOTT Where did you put it, Jim.
IRWIN I put it right behind you.
SCOTT Oh yes, okay. Mag bags all fell out.
IRWIN That purge valve is really dirty.
SCOTT Yes, I bet it is.
SCOTT I'll show you what you were hanging up on. That thing right here. Yeah I'll show you later. Okay purge is up. I guess what we ought to do is not get the clean stuff dirty.. They really ought to have a underneath bag for the dirty stuff.
IRWIN Should have kept all those camera bags.
SCOTT Yep. I'm too sure we get this dirty.
IRWIN Well, we could wrap them in tissue.
SCOTT Yep, okay we'll try that. Hey I'll tell you what, I'll put them in this, and we got to use this purse - let me take all this stuff out of the purse that's clean and stick it in here.
IRWIN Just hand me the purge valve. I'll take care of it. Go on down just a hair.
SCOTT Disconnect the OPS020's.
IRWIN Okay (Garble).
SCOTT Put that brush in here.
IRWIN (Garble).
SCOTT That's disconnected. Neck LM 020 hoses red to red
IRWIN Blue. Red to red and blue to blue.
SCOTT Yes.
IRWIN I think red to blue. Doesn't that sound right?
SCOTT No, reverse them.
IRWIN Okay.
SCOTT Okay. I have, uh... Okay, diverter valve to horizontal and isolation

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IRWIN (Garble).
SCOTT Say again.
IRWIN In there.
SCOTT Jim, turn around I'll get you.
SCOTT Can you back into your corner there.
IRWIN Okay, your put in.
SCOTT (Garble).
IRWIN Let's (Garble).
SCOTT Extract this water from PGA, connect LM water.
IRWIN That's a good idea.
PAO Scott and Irwin going through their post-EVA
check list.
IRWIN Still got a ways to go.
SCOTT That's okay let her run.
IRWIN Okay, press valve off to on.
SCOTT Bio circuit breaker open and connect to LM com.
PAO Apollo 15 first EVA began at a ground elapsed
time of 119 hours 42 minutes with depressurization of the
LM cabin.
SCOTT Hey you got your com.
IRWIN Okay.
SCOTT And audio, CDR and LMP, VHFA received and
(Garble).
IRWIN A mode ISCPT and relay off.
PAO Rover began moving toward the first station
at 12144.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 126:24 CDT 14:59 370/1

CAPCOM Pressure regs to A and B cabin please.

SCOTT Okay, that's complete.

CAPCOM Good show.

PAO Repressurization started at 126:11 and was completed at 126:12 and 20 seconds for a total EVA time, EVA 1 of 6 hours 34 minutes 14 seconds.

PAO Here in Mission Control questions for the crew for the post EVA debriefing are being pulled together for the debriefing crew after the crew completes their post EVA checklist.

PAO Between stations in EVA the crew of Apollo 15 that is of the Falcon, using the electric dunebuggy lunar roving vehicle, traveled at about 8 kilometers an hour during most of the time. The wheels being driven by 1 quarter horsepower electric motors about the size of the average home handiman's electric drill.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 126:34 CDT 15:09 371/1

SCOTT Hello, Houston, Hadley Base.
CAPCOM Hello Hadley Base, this is Houston.
SCOTT Rog, how is everything down there?
CAPCOM Dave, the dust may have settled up there,
I'm not sure if it's settled down here, we've got more data
than we know what to do with at the moment, what can we
help you with?
SCOTT I just wanted to tell you, we've got 2
PLSS charge with O2, one at 95 and 93.
CAPCOM Roger we copy that.
CAPCOM Real fine day's work up there, guys, why
don't you take the rest of the day off.
FALCON Okay, thanks Boss.
CAPCOM Dave, on that PLSS reading, could you tell
us which number belongs to which PLSS, please?
FALCON We should have done that, Jim's got a 95
and I've got a 93.
CAPCOM Roger, Dave, thank you.
FALCON Give us about 30 minutes to get a bite to
eat and we'll press on for the next one, then we won't
have to dock the PLSS.
CAPCOM Dave, Deke says okay, but I'm not sure if
the question was understood.
FALCON Okay.
CAPCOM I thought you added one more word there,
eat and rest.
FALCON Roger.
CAPCOM Hello Hadley Base, this is Houston.
FALCON Go ahead Houston.
CAPCOM Roger, Dave, just wondered how you are
getting along up there and if you have an estimate of
possible debriefing time, we'll shoot for that down here.
FALCON Well Joe, I'd like to get everything
cleaned up here, we got an awful lot of dirt. How about
giving us an hour.
CAPCOM Sounds good, Dave, no hurry at all.
While you are working around there you might be interested
in a little conversation from down here. The SIM bays
chewing up data like it's going out of style. We're
working beautifully and as far as we can determine the
ALSEP is working as advertised, getting all kinds of data
from it and I'll get a good accurate reading for that . .
on that

END OF TAPE

CAPCOM And as far as we can determine, the ALSEP is working as advertised, getting all kinds of data from it, and I'll get a good accurate reading for that, on that for you later on. And I think that your traverse goes without comment, it was beautiful, and we're just trying to digest some of the data from that right now.

FALCON Okay, I'll tell you one thing Joe. Time sure goes fast out there.

CAPCOM Yes sir, you're not telling us anything new Dave, thank you.

FALCON I feel like we spent only 5 minutes at the front in the whole trip.

CAPCOM You'll get some more time a little later. Don't worry, about that. It seemed like about 4 and a half minutes to us, I think. The scenery was spectacular.

FALCON Well good.

CAPCOM Hadley base, this is Houston. If you have loose rocks in the cabin and need containers for them, we're suggesting cover bags number 2, or cover bag number 4.

FALCON Okay, cover 2 and cover 4, for any extra rocks, okay.

PAO This is Apollo Control. Hand over for change of shift under way here in the control center. Glen Lunnays flight team taking over for the night and the sleep shift. Meanwhile the people in the back rooms and the experiment investigators are drafting up their questions for the crew debriefing, the crew of Falcon, which will be upcoming after Scott and Irwin complete their meal. At 127 hours 27 minutes, 29 minutes, standing by on air ground, this is Apollo Control.

FALCON Houston, this is Hadley, are you ready for the battery management?

CAPCOM Stand by Hadley Base.

FALCON We're standing by.

CAPCOM And Dave, we're ready.

FALCON Understand you're ready for the battery change.

CAPCOM That's right Jim, standing by.

FALCON Okay.

FALCON Okay Houston, ED bats are 37 and 37.

CAPCOM Roger, Dave, thank you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 127:34 CDT 16:08 373/1

SCOTT Houston, Hadley Base.
CAPCOM Go ahead, Hadley, this is Houston.
SCOTT Okay, I've got some weights for you,
if you're ready to copy.
CAPCOM Go ahead, Dave. We're ready.
SCOTT Okay, SRC number 1 is stowed and it
weighed 36 pounds. And collection bag number 4 weighs 15
pounds.
CAPCOM Okay, Dave. Thank you.
SCOTT Rog.
CAPCOM And I've got a number for you. The
VHF communication window with Endeavour will open up in about
30 minutes, about a half an hour and you'll have around
10 minutes for conversation with Al, if you'd like that.
Over.
SCOTT We'd like that, thank you.
CAPCOM Very good Falcon, and any time you're
interested in any lunchtime conversation, we've got more than
enough to fill the square down here.
SCOTT Okay, Joe. We'll be giving you a call.
CAPCOM Roger, and we're in no hurry.
SCOTT Okay.
PAO This is Apollo Control. We've just
acquired the Command Module Endeavour. Al Worden on his
26th revolution of the moon and should be eating dinner at
this time.
CAPCOM Falcon, you can go power amp off, low
bit rate.
SCOTT Power amp off, low bit rate.
CAPCOM And Falcon, requesting low bit rate.
SCOTT Low bit rate.
PAO Astronaut Karl Henize here is the
spacecraft communicator for the Command Module Endeavour,
has been conversing with Al Worden. Worden reports that he's
having one of his first relaxed dinners since entering lunar
orbit. Said he was having parsley soup and enjoying it
greatly. In response to a question Worden said that there
were still some particles drifting along with the Command
Service Module, but the number of particles in the cloud or
on the vehicle had diminished and there's no indication of
any problem that might be caused from these particles.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 127:52 CDT 16:26 374/1

FALCON Hey, Houston, we have one comment on our water supply here.

CAPCOM Go ahead.

FALCON The bacteria filter that is on the water gun at some stage in the process today, got broken. It only has a plastic connector on it rather than a metal connector and the plastic connector chipped and started leaking and we don't know exactly when that happened. We found it when we were getting ready to unsuit, we were unsuiting to get a drink and we're not sure whether it spilled a fair amount of water or just the little small puddle that we have here on the . . . on the floor of LM. Have you noticed any significant decrease in our water supply?

CAPCOM Stand by, Dave.

FALCON And of course, Joe, the bacteria filter is no longer useable, if anybody is worried about that, we're not particularly.

CAPCOM Roger, Dave.

CAPCOM Dave and Jim, this is Houston. Our data shows no leakage of water at all, we suspect that the little puddle that you see on the floor is about all the water that's dripped out there.

FALCON Okay, thank you.

CAPCOM And we also don't expect any problem on that broken bacteria filter unless maybe you discovered some spiders and worms under the big rock you turned over.

FALCON No, we're saving those for a surprise when we get back.

CAPCOM They will be.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 CST1637 GET128:01 375/1

PAO This is Apollo Control at 128 hours 7 minutes. Al Worden in the command module, Endeavour, and Dave Scott, and Jim Irwin in Falcon on the Lunar Surface are scheduled to run a communications check using their VHF communication systems, beginning at about 128 hours 14 minutes. We don't anticipate that the Post EVA debriefing and a series of questions generated by the back room science advisory team here will be discussed with Scott and Irwin until after this communications check is finished. The debriefing is not scheduled in the flight plan until 128 hours 50 minutes, or about 43 minutes from now. A short while ago, you heard Dave Scott advise us that the bacterial filter on the water gun in the lunar module had cracked and started leaking. He said that there was a small puddle of water on the floor of the LM, and his only concern was that perhaps more than this had actually leaked out. A check of our telemetry data here on the ground showed that there was no appreciable decrease in the water quantity on the lunar module, and the assumption is that the small puddle which was on the floor of the LM is the total amount of leakage. Scott said that the bacterial filter on the water gun was of course no longer usable, and the flight surgeon here in the control center advised that this would present no problem.

END OF TAPE.

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 128:11 CDT 16:45 376/1

CAPCOM Hadley Base, this is Houston. You're within VHF range of Endeavour now.

FALCON Roger, Joe.

FALCON Hello, Endeavour, Hadley Base.

FALCON Hey, we're doing just fine, how you doing.

FALCON How things going up there Al?

FALCON Okay, you're all broken up, it must be, just coming over those mountains again. See if you can see any tracks down there.

FALCON Well, we got all the way up pretty close to - we got to St. George, got to Elbow and got most of the things done.

FALCON Yeah, pretty nice. I understand that the old SIM Bay's gobbling up the data faster than the moon can produce it.

FALCON Everything nice and clean up there?

FALCON Boy, is it dirty down here. Look we're going to bring this up.

FALCON Yeah, we're just climbing out of our suits right now and buttoning them up and getting ready to power down.

FALCON You too.

FALCON Yeah, I guess there's enough room for one guy now.

FALCON Don't get too small Al.

FALCON (garble) Yeah.

FALCON Hey, that's great. You can see the tracks?

FALCON That's good maybe - maybe you can see the ALSEP.

FALCON (garble) for about 300 feet.

FALCON That's not very good.

END OF TAPE

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SCOTT Well have a nice time, we are going to go back to work, we'll talk to you later.

Okay.

CAPCOM Hello Hadley Base, This is Houston. No need to acknowledge. I have a report from the back room for you. The ALSEP has been turuned on, we're getting very high signal strength from the central station and every experiment seems to be working normally. It's an outstanding job, I thought you would be interested in the fruits of your labors there. Over.

FALCON Thank you Joe, we had a good time doing it, we'll be back with you in about 10 or 15 minutes to talk over the rest of it.

CAPCOM Roger, Dave, we are in no hurry.

FALCON We're coming along pretty good, we got things pretty well cleaned up and we are getting into our nice white suits now.

CAPCOM Sounds good.

PAO This is Apollo Control at 128 hours 39 minutes. Just a few minutes ago you heard Joe Allen, the Spacecraft Communicator, pass up to Dave Scott and Jim Irwin the information that the ALSEP had been turned on, that we had very high signal strength and that every experiment seems to be working normally. Dave Scott mentioned at that time that it would probably be about 10 to 15 minutes before they were ready to begin the post EVA debriefing. This is scheduled to last about 15 minutes, so from that we would estimate that the change of shift Press Briefing will probably not begin before about 30 minutes at the soonest.

END OF TAPE

FALCON Houston, Hadley Base.

CAPCOM Go ahead, Hadley Base, this is Houston.

FALCON Okay, we're all settled down now, with some
beefsteak, and all cleaned up and ready to talk.

CAPCOM Sounds very good, Dave. We've got a list
of questions here, some fairly general geology questions at
the last, and depending upon your answers will build a good
part of EVA-2 on. Stand by a second, I've lost a lockon.
Okay, we'd like to begin, though, with some fairly simple
mechanical questions that will require a yeah, naw answer to
most of them, I think. And they involve ALSEP and Rover.
And I'll just start off at the top of the list here. Dave,
which ALSEP photos did you get out of the way?

SCOTT I got them all but the heat flow, Joe.

CAPCOM Roger, copy, all but the heat flow. And
Jim, when the LSM sunshield was deployed, do you think the
instrument stayed more or less steady? Or do you think it
may have moved a little bit?

IRWIN It might have moved a little bit.

CAPCOM Dave, say it again. I didn't copy that.

IRWIN Hey Joe, this is Jim. It might very well
have moved. In other words it's not level any longer.

CAPCOM Negative, Jim, we don't necessarily know
that. As far as we know, the data looks pretty as a picture.
We just want your own feel for it.

CAPCOM In other words, we have no reason to believe
it moved. We just wanted to get some words from you on that.

IRWIN I didn't notice any movement when I deployed
the sunscreen, Joe.

CAPCOM Okay, fine. When you took the double core,
did you notice any soil falling out of the core tubes while
you put the caps on?

SCOTT Yes, there was a slight amount of lodge from
the lower and a little bit from the upper, but very little.

CAPCOM Okay, that sounds good. And regarding the
question about the Rover track, Jim, you told us they were
one-half inch deep or less, and we're wondering if that was
a typical number over the course of the entire traverse, as
far as you could notice?

IRWIN Well, that was my impression. Half an inch
and in general, but Dave probably has another comment.

SCOTT No, Joe, I'd say, no more than a half an
inch. It seems to ride very lightly; I think the bearing on
the surface is very light and the wire wheels seem to work very
well - they've got a good traction and even though the rearend
did break away several times, it was primarily because of
the locked up front wheel. And I was very pleased with the
operation; I think it performed better than we expected.

CAPCOM Okay, Dave, thank you. Now a series of --

CAPCOM -- questions about the heat flow. We want you first to describe the drilling characteristics, and do you think you're drilling into a layer of rock? Over.

FALCON I'd say yes, Joe, the drilling characteristics are: gradually increasing requirements per force to get it in, more so than any force I experienced in the one G training when we had the packed soil. One time we did have some that was packed so tightly that I couldn't even get it in, but that was because of the weak battery on the training unit at the at the time. The drilling is, requires more and more force the deeper you get, and you could probably see the TV there at the end, on the second one, I had the second probe about half way in and I was putting almost my entire weight. Even though it was 1/6, there was quite a bit of force behind that drill, much more than I've ever experienced from any training. I had the impression that, yeah, we're drilling through rock.

CAPCOM Roger, Dave, we hear you on that. Similar question, was the drill torque high, while you were drilling?

SCOTT Well, high is a relative term; I had to maintain quite a bit of pressure on it to keep from being turned, but I tried it in the 1/6th G airplane several times to see if it was too high so that I could get my grip holding, and I could always hold it, I can hold it here even though the torque was fairly high.

CAPCOM Okay, Dave, that's a clear description. We know that the stem is loose in the hole as far as the rotational motion goes, we're wondering if it's loose in the up and down direction. Do you think you could pull it out?

SCOTT I don't know, Joe, I don't really know.

CAPCOM Okay, Dave, copy that. Is the drill thermal shroud off the drill unit?

SCOTT Yes, you mean the small aluminum colored shroud that goes over the battery?

CAPCOM That's affirm.

SCOTT Yes, that's on.

CAPCOM Okay, and were the void bolt guide cups removed from the heat flow experiment?

SCOTT Gee, I had to think about what you mean. All the void bolts are off the box as far as I know.

CAPCOM Okay, Dave, our question concerns the covers for the void bolts. They're calling them the guide cups down here.

SCOTT Do you mean, are they off now or were they off when we started?

CAPCOM Dave, we mean are they off now. Did they fall away from the unit when you picked the unit up. It's of relative unimportance really but it would just be an interesting data point.

SCOTT I didn't pay much attention, Joe, but I think all the void bolts came off the heat flow. Finally, I think.

END OF TAPE

CAPCOM Okay, Dave. Thank you. Jim was the central station sun compass on the orange mark when you last saw it?

IRWIN I guess it was, Joe.

CAPCOM Okay, and I'm sorry I skipped over a question here. Dave, where is the drill vice and the drill treddle right now as you remember.

SCOTT The drill vice is next to the second probe which is the western probe and the treddle is at the point at which we parked the Rover.

CAPCOM Okay, that agrees with our guess on that. Jim, once again back to the central station, how accurately was the bubble level when you stopped?

IRWIN It was within oh, 1/8 to 1/4 of the center.

CAPCOM Okay, that sounds good to us. Could you tell us whether the north facing side of the central station can see any portion of the RTG?

IRWIN No, it definitely cannot. Because the RTG is perhaps a little south and east as far as the central station's concerned.

CAPCOM Roger, we copy that. And Dave, could you call out to us the problem with your yoyo and do you think it can be fixed?

SCOTT No, we looked at it when we got back in Joe, but the string broke that is the attach point on the inside of the yoyo.

CAPCOM Okay, Dave and Jim, you might want to consider switching out the yoyos, Jim, you may want to pass yours over to Dave for the next EVA.

IRWIN We've already done that, Joe.

CAPCOM You're always one step ahead of me. Some quick questions about the Rover now. Could you confirm that battery 2 amp volts meter always read zero please.

IRWIN I guess I can't answer that Joe, I could never see the amperage on 2 when we were driving.

SCOTT My answer to that would be yes, I never saw a motion of that needle.

CAPCOM Okay, that's good - plenty good enough for us. As you know, we think that you've got 2 good batteries, but possibly a failed meter there. And the Rover power consumption looks like it's right on the money and we've got a lot of gas for the next EVAs. The amp hour meter data which we have does have a couple erratic points in it. We're wondering if you noticed any meter movement anomalies.

IRWIN This is Jim, I didn't notice any meter motion or anomalies Joe.

CAPCOM Okay, Jim, thank you. And we're assuming that the Rover is now parked facing north. Is that correct?

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IRWIN That's correct.

CAPCOM I could have guessed as much. And a question about the suspension, which sounds kind of exciting. Did you ever notice it hitting bottom?

SCOTT Yes, we hit bottom a couple of times when he hit a rock and it seemed to respond fairly well. You could feel that it had bottomed out - I might add something else too on the battery problems Joe. I'm sure you're right about that because I noticed backing up a couple of times the front wheels did right.

CAPCOM Okay, interesting comment, Dave, thank you. Now we're getting on to the toughies here, and coming up to a very interesting one. We'd like to know what your best estimation of the LM's position is. Over.

SCOTT Standby.

CAPCOM And Dave and Jim, let me give you some background on that. We've got several points that are in a very tight cluster around the first location we gave you we think however, because of bootstrapping allocation from Elbow Crater backwards using the Rover navigation system, we think you may be mistaking Last Crater for Index Crater. And I want you to consider this as you look at your map and think about your present position. Over.

SCOTT -- my -

SCOTT Joe, you've stipulated an interesting discussion, give us a couple more minutes.

CAPCOM Yeah, we thought we might, Dave.

CAPCOM And Dave and Jim, as you well know, this question is pretty much academic because we're doing great guns so no matter where your exact location is, and it's something we'll construct later, but we're interested nonetheless.

SCOTT Roger.

SCOTT Okay, Joe. How about 733 Bravo Sierra 4. And I guess that's the best because we are on the northeast side of a double crater.

CAPCOM Voiala. We understand.

SCOTT Sure nice, that Rover will make 12 13 clicks isn't it?

CAPCOM It sure is. Richard's studying the maps here momentarily. In the meantime could you give us just a rough guess, a quick rundown as to where the samples at station 1 were taken with respect to the rim of Elbow and we're interested in distance and direction from the rim. Just a rough guess.

SCOTT Standby.

END OF TAPE

SC Stand by. Okay, Joe 709, Bravo, Echo 5 and we moved out about 200 feet to the East of that point in picking up the C video sample.

CAPCOM Okay, Dave, copied that loud and clear, and by the way, Rover, nav system gave us exactly the same coordinates as you just called down for your LM location. Interesting coincidence, or perhaps not a coincidence. Moving on to the next question. Near Elbow crater, Dave, you mentioned that your footprints exposed white soil. We wonder if this was a common occurrence. Did you observe similar white soil in foot prints elsewhere? Over.

SCOTT Joe, I sort of kicked through the rim of a small 1 meter subdued crater and as I did that, I picked up the white soil. And so I kicked a couple of more times and it spread out, and whether I was breaking up a very viable rock, or not I don't know, but there was a couple of pit falls of dirt that was white, and when we came back past it on the return trip from the LM, why I pointed it out to Jim and he saw it too, and I'm not sure whether that was just as that one small crater, it was an old crater, or whether that was typical of that particular area, and we just didn't have time to look at it.

CAPCOM Roger, Dave, copy that. And coming back to station 1, Elbow crater, could you give us a quick rundown on the changes in rock distribution around Elbow crater and if possible, maybe even the changes in rock types there, over.

SCOTT Stand by one.

IRWIN Joe, our clocks were running pretty fast when we were there and I guess we didn't get a chance to look at the distribution very well. As I remember it, there were more blocks, not really blocks, but large fragments, on the order of 6 inches to a foot, more on the southern rim, although it wasn't really heavily concentrated. I'd say 10 percent of the surface at most. There was more on the southern rim than on the northern rim, and the ones we sampled all looked pretty much the same. As I remember, the radial sample doesn't show a great difference in rock type, although, as you know, we just didn't a chance to do much looking and thinking there.

CAPCOM Roger, Dave, we copy that, and answers our question very well. Once again regarding Elbow crater, Jim you called out to us a bench around the east side of Elbow and you were looking down into Elbow from higher up on the front. We wonder if you could compare that bench with breaks in the slope of the Rille wall, over.

IRWIN Joe, when I commented on bench, I would estimate 2 or 3 different levels that are, were very subdued possible benches in Elbow, and I did not see any immediate

IRWIN relation between those subdued benches in Elbow and the Rille.

CAPCOM Okay, Jim, copy that. Sounds pretty reasonable. We'd like to move on down towards station 2 now and have a series of questions about station 2. The first one, being, what rock samples did you get from station 2, and we're more interested in the samples that did not come from the large boulder, but rather what other samples did you get there, over.

SCOTT Okay, stand by.

IRWIN Okay, Joe, our sum total in station 2 was 2 chips off the large rock, soil from the (garble), soil adjacent about a couple of feet away from the rock, soil from beneath the rock in the double core and the comprehensive.

CAPCOM Okay, Dave you called it right on from memory. That's exactly the score sheet we had. Stand by a second and let me read over this second question. Okay, regarding the boulder, do you think possibly that the black part of the boulder might be a big clast in a course retcha, over.

SCOTT No, I'm not sure Joe. The retcha that was in there was glass covered and there was an exposure after I took a chip out of it, that was a retcha not unlike 14. As a matter of fact, I'd say it was almost typical of 14's but maybe on the 2nd or 3rd order. There definitely was a linear, I call it a contact. Whether it might have been a very large clast inside a very large rock, there's no telling, but there was a definite line there, which differentiated 2 types of rock within that big boulder and I really wouldn't want to guess whether that was a large clast or not.

CAPCOM Okay, Dave sounds good. Could you tell us where the samples which came off the boulder were taken in relation to this contact that you called out on the boulder. In other words where did the chips come loose from? Over.

SCOTT Okay, if you consider the boulder being divided in 5ths, one fifth of it was a different type apparently by it's sort of topographic contact. We took one chip from that side, and one chip from the corner on the other side.

CAPCOM We copy that, thank you. We would like for you to summarize the relationship of Mare and Apennine Front in the Elbow, St. George area. We're looking for any evidence whatever of a contact, an albedo change, or a change in coarse frag abundance, over.

SCOTT Joe, we looked, and we discussed it before we went out, and we've discussed it since we've come back and honestly didn't see anything.

CAPCOM Roger Dave and you discussed it about the

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CAPCOM same way during the traverse, so it sounds very consistent to us. Do you think that you can drive to either Spur or to Window Crater?

END OF TAPE

CAPCOM Do you think that you can drive to either Spur or to Window Crater?

SCOTT Let us that a look here, quick.

SCOTT Well, there's a number of craters down there, in the area of Spur and Window and note the open crater up on the Apennine Front, and there are several the same size as Spur and Window, I think were not evident on photography because of the albedo and the sun. I think we can get to some of those craters, yes. I . . . I'm not sure if it would be Spur or Window, but there are some craters up on the side of the Front, I'm fairly sure we can get to.

CAPCOM Roger, Dave, copy that, and that is exactly the answer we were after. No necessarily those particular craters, but craters similar to them and we understand exactly what you're saying. We'd like to ask, were the abundance of white and white-gray rocks described in the vicinity of the Falcon, the same seen along the entire route to St. George or did this abundance of white and light gray rocks seem to vary. Over.

SCOTT Joe, I think we have a great variety of . . . of fragments out here, I . . . I wouldn't want to pin down any particular type in the areas until we have more time to look. We've got a couple of surprises for you. We have one fragment on the order of 6 inches which is a . . . fairly well rounded, highly vesicular basalt with vesicles on the order of 3 millimeters all over it, apparently quite old and rounded and it's a brownish gray. We also have a large piece of glass, sheer glass apparently which is about a foot long and about 6 inches wide and rough textured surface and that was the one that was right out the front window here that I described yesterday. And the basalt we picked up half way back when I had to change my seat belt, I saw it on the ground and I just couldn't resist it. And it's unlike anything you've seen from the moon before, as is the large piece of glass. And I think those are indicators, to me, that we have a great variety of samples out there, and we really need to do some good careful looking as we head down towards the Front.

CAPCOM Roger, Dave, read you loud and clear on that and that really brings us to our last question. We are in the process of starting to plan your traverse tomorrow, it's going to be a good one. We have no equipment problems that we are looking at right now and we would like to ask you if there are any particular inputs you would like to make into the planning team regarding tomorrow's traverse? Over.

SCOTT Okay, let us talk it over a minute, please. Joe, we've talked it over and we think the best thing to do is to stick exactly with the plan we have now. I think we understand what we are looking for, even though we didn't find any . . . some of the things we were looking for today, that doesn't mean that we won't find them as we head down the Front Crater and I guess about the only input we have would be that if we can make as good a time on the Rover tomorrow as we did today, perhaps we will have more time to sample this variety of stations along the Front and on the way back, but in general, I think we stuck with our preflight plan.

CAPCOM Right on, Dave, we copy that and I think we are going that direction. Sounds good. We got a couple more general questions and then a comment about the 16mm camera and after that we're going to be closing up shop down here. One more geology question, do you have any feel for whether the frags around the small fresh craters that you've called out to us are in general pieces of the projectile or do you think they're ejecta frags? Over.

SCOTT Well Joe, we're pretty sure they're projectile frags, and that's when we really need to stop and sample.

CAPCOM I agree, Dave. We think the same thing here. A quick comment on your 16mm film. We think that that camera . . . the dac is still in good shape, the mag Charlie was a bad magazine, we think you can help us out on the other magazines left tomorrow by advancing the film with your fingers just to make sure it's moving freely into the magazine before you clip it on to the camera itself. And that's something you can do while you are packing the ETB and do it tonight. Over.

SCOTT Rog, Joe, that's a good analysis, we took mag Charlie and tried to run it with our fingers and it won't run, it's absolutely jammed right at the beginning and we'll run the others through tonight to make sure they work.

CAPCOM Sounds terrific and Dave and Jim, we'll be standing by for a crew status report. No hurry on that, and as I say we are going to close up shop down here, we've got more data really than we know what to do with. But we'll work hard on it and be back with you in the morning. I do have liftoff time pad to send to you, Jim, when you're ready to copy.

SCOTT Okay, he's got his pencil out, go ahead.

CAPCOM Roger, lift off times T28 132 17 54, T29 134 16 02, T30 136 14 10, T31 138 12 19. Over.

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IRWIN Okay, Joe, beginning on 28, 132 1754,
134 1602, 136 1410 and 138 12 19.

CAPCOM Readback correct, Jim, you've been doing
good work all day.

IRWIN Well, we're trying.

CAPCOM Roger, and Dave and Jim, one last comment,
which . . . which we're pretty sure you are aware of, we
think we are looking at an EVA tomorrow that'll run about
6 and a half hours, about the same thing we did today and
we do have a few miscellaneous items to clean up, either
most likely at the end of the traverse, so it's liable to
be a little shorter distance wise, but otherwise, other
than that, it'll be more or less unchanged. Over.

SCOTT Okay, very good, Joe. By the way, did
you notice that I had a higher O2 usage all the way
through, and is that why we are looking at 6 1/2 instead
of 7 hours.

CAPCOM That's correct, Dave, we've got very good
data points on you, it's a steady curve and O2 rate is
just a little bit higher than we predicted and from the
looks of it, you've really been doing some work up there.

SCOTT Well do you have any idea why there's a
rate maybe perhaps may be a zipper could be lubricated or
something like that?

CAPCOM Dave, this is a metabolic curve, plain and
simple, it's not a leak rate at all.

SCOTT Okay, well I'll breath a little less
tomorrow.

CAPCOM We don't recommend that, although the
surgeon is working on it right now. The numbers actually
that we are coming up on, Dave, is about . . . well, the 2
numbers are 1,150 btu's per hour working and about 700 btu's
riding. Over.

SCOTT Okay, that's a little higher on the riding
than I think we expected, but it's sort of a sporty job to
drive this thing to make sure we don't run into the
craters and if you can get that front steering figured
out, it'll sure help.

CAPCOM Get 6 1/2 hours like you did today, guys,
nobody is going to complain.

SCOTT Okay, Roger.

END OF TAPE

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CAPCOM Dave and Jim, I'm going to sign off now and I'm getting excited about tomorrows traverse already, and Bob's coming on. Over.

FALCON Okay, Joe. You did a super fine job today, and we sure appreciate you keeping track us and keep us going in a straight line. We'll be looking forward to seeing you tomorrow.

CAPCOM Yes sir, wouldn't miss it for the world.

CAPCOM And Falcon we'd like biomed right, please.

FALCON Okay, biomed right. There's nothing there right now, but we'll give it to you.

CAPCOM Roger, you have it completed, then.

PAO This is Apollo control at 129 hours 37 minutes. Our change of shift press briefing with the gold team is scheduled to begin shortly in the main auditorium at Building 1 at the Manned Spacecraft Center. We'll be reacquiring the command module in about 6 minutes. Al Worden is scheduled to begin a sleep period at about 133 hours 20 minutes. The principle order of business with the lunar module crew, Jim Irwin and Dave Scott will be to get to bed as soon as possible and they have nearly completed the list of activities prior to beginning their rest period. During the change of shift briefing we'll record any conversation that we have with the crew on the lunar surface, and play those back following the briefing.

END OF TAPE

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PAO This is Apollo Control at 130 hours 25 minutes. During our change of shift briefing I believe we had 1 or perhaps 2 very brief conversations with Scott and Irwin aboard the lunar module Falcon on the moon's surface. We have about 30 minutes, 31 minutes of acquisition time left with Al Worden in the command module, and it's also been a relatively quiet pass aboard the command module. Scott and Irwin at the present time, are in their presleep checklist stowing the lunar module cabin, and they'll be rigging the hammocks for sleep. We need to get a crew status report from them and then we plan to bid them good night. We'll play back the tape that we accumulated for you now during the - the tape that was accumulated during the change of shift press briefing. We'll play that back now.

CAPCOM And Hadley, this is Houston, over. We have about 5 minutes before you have to turn the lights out, and we'd like suit gas converter to cabin, cabin gas returned to auto, and the Doctors would like a Crew Status report, can you believe.

FALCON Okay let's do that later.

CAPCOM And Hadley, this is Houston, over.

FALCON Go ahead, Houston.

CAPCOM Rog, we noticed over the last half hour or so, a 25 pound drop in the water quantity. We're wondering if you guys doing something. Know anything about that, you could clue us in on.

FALCON Rog, we just recharged both PLSS's.

CAPCOM Rog, was that in the last hour and a half.

FALCON Rog, this was in about the last, oh 30 or 40 minutes.

CAPCOM Okay, copy.

FALCON Does that fill the gap for you?

PAO This is Apollo Control at 130 hours 53 minutes. The flight surgeon just reported that he's now got good bio medical data on Jim Irwin, which indicates that the crew aboard Falcon, Irwin and Scott are getting set for their sleep period. We've gotten a call from Dave Scott, so we'll pick that up.

FALCON Okay, we've got a crew status report for you.

CAPCOM Go ahead.

FALCON Okay, no medication, and the PRD is on, CDR is 5019 and the LMP, 8023. The both PLSS took their recharge well and I think they're ready to go for tomorrow, and I guess we're done for the day, so we're going to roll up the shade.

CAPCOM Roger Dave, and one last comment to give you a good nights sleep. That little water leak you guys saw when

CAPCOM you came in the cabin this afternoon. Right now, our plots are showing that as 25 pounds. Do you guys care to make any comments about the size of the leak or anything more about that.

FALCON Fine. No, except that when we got in, that little plastic connector on the, on the bacterial filter was broken and there was water running out of it.

CAPCOM Rog, understand, was it a steady stream.

FALCON Yea, that's about right.

CAPCOM Roger copy and I guess we're steady now and you can go to sleep on that note and we'll promise to try and not wake you up this morning.

FALCON Well if you see something that you'd like to look at, you can go ahead and wake us up.

CAPCOM Yea, I'm sure. Okay, Dave, I think we've said all we want to say on that, and I don't think there's anything else you can do about it at the moment, and we'll just let it go.

FALCON Okay, what does that do to our profile on the water?

CAPCOM We're looking at it Dave. It looks like it puts it a little bit closer to redline, but it's still above the redline.

FALCON Okay, fine. See you in the morning.

CAPCOM Good night.

FALCON Good night.

PAO This is Apollo Control at 130 hours 58 minutes. We've now had loss of contact, radio contact with Al Worden aboard Endeavour as he's gone around the corner of the moon on the 27th revolution. And we've said good night to the crewmen aboard both spacecraft. Actually Worden will not be beginning his rest period until about 133 hours, on the 29th revolution, however on the next revolution, the 28th he will be configured for the bistatic radar test which uses the command module s-band and VHF communication systems to reflect radio frequency energy across the surface of the moon. This reflected energy, when it's received by the proper instruments on earth will provide information on the surface features of the moon. Such characteristics as the lunar surface roughness, the shape of the surface, thickness of the regolith and also some information on surface electrical properties. So we do not expect to hear from Al Worden until the end of his 7 hour sleep period tomorrow. Shortly before saying good night to Irwin and Scott aboard Falcon. We received from them a crew status report. They report having taken no medication, and Scott said they both had to recharge both of their portable life support systems and that both systems have taken the charge well. Said they were done for

PAO the day and would be rolling up the shades in the lunar module getting some sleep. We did discuss with them a point that had come up earlier in the evening. A leakage of water from a broken bacterial filter on the LM water nozzle. Previously when asked by the crew about this the LM systems engineer did not see any significant decrease in the water quantity as a result of this leak, however on a more thorough review of the data and plotting out a chart of it, it appeared that about 25 pounds had been lost. We queried Scott about this and he confirmed that the water was coming from the nozzle in a fairly steady stream which would account for the loss that we've apparently seen. The evaluation at the present time, is that this will put us a little closer to the redlines on the total water needed to complete the mission, but it still puts us comfortably above them so we would not expect it to have any effect on the mission. We said goodnight to Scott and Irwin at 130 hours 57 minutes and we do not expect to hear from them until the end of our rest period. At 131 hours 1 minute this is Apollo Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 131:42 CDT 2017 384/1

PAO This is Apollo control at 131 hours 42 minutes. We're just about reacquire the command module Endeavour, although, we do not expect communications this revolution. We've had acquisition of signal. Al Worden aboard Endeavour will be performing the bistatic radar test using the S-band and VHF communications systems onboard the spacecraft for that test. And for that reason we will not be getting telemetry data or communication from the CSM this revolution. Possibly a small amount of telemetry, but at the beginning of the pass and at the end. But for the most part this front side pass with the command module will be without telemetry and no voice communications. The surgeon reports that the biomedical on Jim Irwin onboard the lunar module, Falcon indicates that Irwin is now sound asleep and it appears quite likely that the crew will get about 6 1/2 hours of good sleep tonight. The CSM orbit at the present time is 65.9 nautical miles by 51.5. And although we don't expect any further communications with either Worden aboard the Command Module or with Scott and Irwin aboard the lunar module we'll continue to keep the circuit up live. At 131 hours 44 minutes. This is Apollo control standing by.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 132:53 CDT 21:28 385/1

PAO This is Apollo Control at 132 hours 53 minutes. We have about one minute of acquisition time left with the Command Module, Endeavour before the spacecraft goes around the corner of the moon on its 28th revolution, and we've had a brief bit of telemetry, both at the start of this front side pass and toward the end of it. Spacecraft appears to be in good condition, we've had no communication with Al Worden as was expected. Worden is performing the Bi-Static Radar Test using the Command Module S-Band and VHF communications system for this test, and at the beginning of the next revolution, the 29th revolution, he is scheduled to begin his 7 hour rest period. So, we do not expect any further communications with Worden aboard the command module. We said goodnight to Jim Irwin and Dave Scott aboard the Lunar Module at 130 hours 57 minutes and the Flight Surgeon reported a little less than an hour later that Irwin appeared to be sound asleep and we have biomedical data on Irwin, not on Scott which is a normal procedure during a rest period. This would appear to give the crew aboard Falcon about 6 hours, perhaps a little bit more sleep before their scheduled wake-up time to begin preparation for their second EVA. Planning for that second EVA will continue throughout the night. At the present time it appears based on the oxygen consumption rates and the portable life support systems during the first EVA and the metabolic rates for the crewmen, the second EVA, extra vehicular activity period, it will be about 6 hours 30 minutes, the planned time on it. This was to have been a 7 hour EVA, but based on the oxygen consumption rates and metabolic rates of the crew during the first EVA we're planning on a somewhat shortened exploration period for the 2nd EVA. We're plotted at 6 hours 30 minutes and if the oxygen consumption rates are a bit lower than predicted, we would be able to extend it towards the nominal 7 hours. We've had loss of signal now with the Command Module, we will continue to monitor for any communications with the Lunar Module although we do not expect any. At 132 hours 56 minutes, this is Apollo Control standing by.

END OF TAPE

PAO This is Apollo Control at 133 hours 27 minutes and Mission Control at the present time, we are in the process of a shift change over. Flight Director Milton Windler and the maroon team of flight controllers coming on to replace Flight Director Glynn Lunney and the black team, and the spacecraft communicator on the upcoming shift will be Astronaut Gordon Fullerton. We will be reacquiring the Command Module, the Endeavour, in about 13 minutes. We expect at that time that Al Worden will have begun his sleep period, we are not anticipating any conversations with the spacecraft, we said "goodnight" to Irwin and Scott aboard the Lunar Module at 130 hours 57 minutes and we're scheduled to awake the two crew on the lunar surface at . . . in another 4 hours and 30 minutes. We do not antici . . . do not plan to have a Change of Shift Press Briefing following this shift. Both spacecraft at the present appear to be in stable conditions. The instruments aboard the scientific instrument bay of the Command Module are all functioning well, with one relatively minor exception, the panoramic camera appears to have a problem in the mechanism which compensates for the forward motion of the spacecraft relative to its altitude, and this mechanism appears to malfunction about one out of every 10 frames and about one out of every 10 frames will be smeared. The remainder of the frames . . . it appears are . . . will be normal and with no problem. We will be reacquiring the Command Module now in about 11 minutes. At 133 hours 29 minutes, this is Apollo Control standing by.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 CST2230 GET133:57 387/1

CAPCOM Endeavour, Houston, over.
PAO This is Apollo Control at 133 hours
55 minutes. Capcom, Gordon Fullerton has just completed
a brief conversation with command module pilot Al Worden,
giving him some antenna pointing angles, so that we can
get better data from the simbay experiments, and briefly
discussing the presleep checklist. We will probably hear one
more time during this pass from the command module. We've
asked Al Worden to give us a call just before he beds down.
The crew in Falcon has 4 hours 3 minutes remaining in their
sleep shift, and Endeavour is about half way through the
29th, halfway through the front side of the 29th revolution
of the moon. Just about now passing over the landing sight.
At 133 hours 57 minutes, this is Mission Control, Houston.

END OF TAPE.

APOLLO 15 MISSION COMMENTARY, 7/31/71, 23:28 CDT, 134:54 GET, 388/1

PAO This is Apollo Control at 134 hours
54 minutes. We've had loss of signal on the Endeavour as
it has gone behind the moon on it's 29th revolution. All
systems aboard the command service module looked good as
it went around the corner. And command module pilot Al
Worden has configured his communications system for his
sleep period. The only conversation we had with him during
this pass was to pass up some antenna angles. Aboard Falcon
at Hadley Base everything continues to go well. Lunar module
pilot Jim Irwin is sleeping well according to the biomedical
monitoring being done here. Cabin pressure is 4.8 pounds
per square inch. Cabin temperature 56 degrees Fahrenheit.
And the latest report is that ALSEP operation continues to
be normal. That's the experiment package set up on the lunar
surface by the crew this afternoon. All experiments are on
with the exception of the SIDE which is on standby as planned.
And all parameters are within normal limits on the ALSEP.
At 134 hours 56 minutes this is Mission Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/1/31, 23:30 CDT, 134:56 GET, MC389

PAO This is Apollo Control at 135 hours
58 minutes. All still going well with Falcon on the lunar
surface. Crew still asleep. We've had no communications
with them since they went to bed. They're due to be awakened
in 2 hours 1 minute. The command module Endeavour is now in
it's 30th revolution on the front side of the moon and we have
data from Endeavour although we have not talked to command
module pilot Al Worden during this pass. Endeavour's in a
65.9 by 51.6 nautical mile orbit. It's present altitude is
63 nautical miles and it's velocity 5324 feet per second.
At 135 hours 59 minutes, this is Mission Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 136:00 CDT 1:34 390/1

PAO This is Apollo Control at 136 hours 58 minutes.
All systems aboard Falcon and Endeavour still normal. We
had loss of signal from Endeavour a few minutes ago on it's
thirtieth revolution. We're 1 hour 1 minute away from wake
up time for the crew of Endeavour at which time they'll start
preparing for their second EVA. At 136 hours 59 minutes,
this is Mission Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/1/71, 1:35 CDT, 137:00 GET, 391/1

COMM CHECK Honeysuckle comm tech, Houston comm tech, net 1. Voice check.

HOUSTON I read you Honeysuckle, net 1, loud and clear.

COMM CHECK Roger. Loud and clear also.

HOUSTON Good.

PAO This is Apollo Control at 137 hours 58 minutes. We're a little over a minute away from wake up time for the crew on Falcon. We'll stand by for a call up to the crew.

PAO This is Apollo Control at 138 hours 1 minute. Soon after awakening the crew we're going to ask them to take - look for any water that might be in the LM from the leak that was reported right after ingress after the first EVA when the water bacteria filter broke and leaked some water out. We have a feeling there may still be some water in the LM. We're going to ask them to look for it. We'll be sending that wake up call soon. We'll - beginning to stand by.

CAPCOM Good morning, Falcon. This is Houston. Over.

FALCON Morning Houston. This is Falcon.

CAPCOM Roger, Falcon. Houston, loud and clear. When you're up and ready to converse let me know.

FALCON Okay, Gordo. Will do.

CAPCOM First thing we've been concerned about I guess we'll start off with this is according to our data you lost about 25 pounds of water during the post-EVA yesterday and we - it appears that it leaked out during that problem you had with the broken bacteria filter. What we're wondering is if you've looked around carefully in the cabin and noticed any sign of that 25 pounds of water. We suggest looking back behind the ascent engine cover cause it possibly would have run back there and not have been obvious to you. Over.

FALCON Okay. There was some on the floor in the (garbled) and we just never took the time to take a look in the back, but we will.

CAPCOM Okay. If you find any water back there we have some suggestive procedures to clean it up and we'd like to do that before depressurization.

FALCON Roger. Will do.

PAO This is Apollo Control. The LM is sitting at about a 9 or 10 degree angle and that's why it's felt the water may have run back behind the ascent engine cover.

FALCON Houston, Falcon. Yes, we do have a little puddle of water back in the - behind the ascent - behind the engine cover.

APOLLO 15 MISSION COMMENTARY, 8/1/71, 1:35 CDT, 137:00 GET, 391/2

CAPCOM Okay, Dave, our suggestive procedure for collecting that will be to remove the netting and whatever is required to get down to it. Use a used through bag as a scoop if it's a deep enough puddle to scoop it up and take one of the used bio containers that contains a used cartridge that's in the buddy PLSS bag now that scheduled for the upcoming jettison. Take the LiOH cartridge out of the container and use the container itself to hold the water as you scoop it up with the PLSS bag. And then when you get down to the point where you can no longer get any more water use utility towels to mop up the rest. Over.

FALCON Okay. We'll do our best.

CAPCOM And if one of you is not busy I do have a pad with the liftoff times for revs 32 to 37.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 138:12 CST 1:47 MC 392/1

FALCON Good morning, Gordo. I'm ready to copy.
CAPCOM Okay Jim. One more tidbit on the water problem. If, according to our figures here; that ETB bag that had the cameras and film you are going to use on the next EVA may be back there where the water is, and we suggest you get it up out (garble). Over.
FALCON All right. We'll take care of it.
FALCON Gorden; we're all ready for the pad.
CAPCOM Oh, okay Jim. T32 is 140 10 24; T33 142 08 33; 34 is 144 06 40; 35 is 146 05 03; 36 is 148 02 57; and 37 is 150 01 and 04. Over.
FALCON A 140 10 24; 142 08 33; 144 06 40; 146 05 03; 048 02 57; and 150 01 04.
CAPCOM Okay Jim. Your readback is correct.
CAPCOM Jim. One other question. If you can remember back to before you went to sleep. This is in reference to the problem you had with the flags at the start of the EVA I, and we are figuring that that was probably caused by an air bubble that was in your PLSS feed water system. We're wondering if, when you recharge the PLSS feed water here after EVA I, were you holding the PLSS in a vertical position. That would eliminate any possibility of a bubble; and we wanted to verify if that was the case or was it tilted over somewhat. Over.
FALCON It was tilted over slightly when we recharged after EVA I.
CAPCOM Okay, standby and I'll see if we want to recharge it or something. We'll check on what they want to do. Can you give us a rough idea of what sort of angle it was tilted at and in which direction.
CAPCOM Jim, this is Houston. Over.
FALCON Go ahead, Gordo.
CAPCOM Did you copy my last question about, I'll repeat it, "Can you give us an estimate of how far off of vertical the PLSS was in degrees, roughly, when you did fill it up?" Over.
FALCON It was about 30 degrees off vertical when we recharged it.
CAPCOM Okay. Thank you.
CAPCOM Jim, this is Houston.
FALCON Yes?
CAPCOM That 30 degrees is probably enough to cause the problem you saw on the start of EVA I, and we may, depending on how you do with cleaning up the water and so forth, want you to re-topoff the water or maybe the Oxygen also on both PLSS's We'll have more on that later. I do have a consumable update for 138 hours, when you are ready to copy.
FALCON Standby.
FALCON Okay. Go ahead Gorden.
CAPCOM Okay, a -----

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 254 CDT 138:19 GET MC 393/1

FALCON Okay go ahead Gordo.

CAPCOM Okay. RCS Alpha 85 percent, Bravo 85
Descent 02 number 1 71.5 number 2 68.4, Ascent 02 number
1 99, number 2 99, Descent water number 1 42.3, number 2
40.2, Ascent water number 1 100 percent, number 2 100 percent.
and Descent AMP hours are 1157, Ascent AMP hours 572. Over.

FALCON Roger, I copied all that.

CAPCOM Okay.

CAPCOM Falcon, Houston. Over.

FALCON Go ahead Houston.

CAPCOM We've got some conversation to come up to
you regarding to some updates to the EVA prep and also
about the EVA traverse plans and if that will fit in with
what your doing let us know and we'll go ahead and give those
words to you. Over.

FALCON Dave is off com right now so I don't want to talk
about the EVA plan or the traverse plan, but maybe the EVA
prep I can talk to you about.

CAPCOM Okay, Jim. If you've got a piece of scratch
paper here I'll give you the camera magazines, we figure
you should be in the ETB and on the cameras at the start
this. They've changed slightly from the, what you loaded
last night. Over.

FALCON Okay. Did Dave tell you what we had
loaded last night?

CAPCOM I'm not sure I'll have to check on that.

FALCON I don't think we - we have the ETB loaded
and that ought to tell you what we have in the EPB.

CAPCOM Okay, fine.

FALCON Okay the EPB is loaded per check list and
the additional MAG is MAG-PAPA.

CAPCOM I understand that's MAG-PAPA. Is that
correct?

FALCON That's affirmative.

CAPCOM Okay. Let me cross check that here and see
if we can get anymore words on that. Let me give you one
other suggestion and that's for securing the high gain
antenna cable on the Rover, we'd like to suggest that you
get the roll of tape out, strip off about 1 foot and fold
the one two inch tab on one end of it and wrap that piece
of tape around the CDR camera so that after you get down
to the Rover you can use it to secure the high gain cable
to the high gain antenna mast. To keep it from flopping
around. Over.

CAPCOM Jim, this is Houston. Did you copy that
about the tape?

FALCON Yes, we copied.

CAPCOM Okay. One other thing is, we suggest
that you each wear your EVA-1 cross check list on your right

APOLLO 15 MISSION COMMENTARY 8/1/71 254 CDT 138:19 GET Mc 393/2

CAPCOM arm for use at the end of EVA-2. That's
for both of you. Over.

FALCON Oh, yes, we already put in ETB.

CAPCOM Okay. Can you give us a postsleep status
report there.

FALCON Well, we both slept the full time and we'll
get the PRD readings if required in a little bit.

CAPCOM Okay. I understand.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/1/31, 3:30 CDT, 138:55 GET, 394/1

CAPCOM Jim, this is Houston. Over.

FALCON (garbled).

CAPCOM On the ETB load camera stuff, we'd like you to add Delta 16 millimeter mag Delta Delta to the bag and also if you have your camera loaded with Kilo Kilo we'd like you to take it off. Put Kilo Kilo in the bag and put Papa Papa on your camera. Those are the only two changes that we see from what we figure you have right now. Over.

FALCON All right. Jot down your recommendations again. Say again.

CAPCOM Okay, Jim. Add 16 millimeter mag Delta Delta to the bag load first of all and then on your 70 millimeter camera, that's the LMP 70 millimeter camera, take off - we assume Kilo Kilo is on it now. We'd like you to take that off and put Papa Papa on to your camera. Over.

FALCON You're suggesting we take 16 millimeter Delta out and take mag K on my camera and put Papa on my camera, but probably carry Kilo out with us.

CAPCOM That's affirmative, Jim. Carry Kilo Kilo with you and I think you said it right. But take Delta Delta along also in the bag. Over.

capcom Houston. Over.

FALCON Hello, Houston. We're about ready.

CAPCOM Okay. A couple of questions. First of all we wondered if you have brought up the LGC and cycled it through program 6 there. We haven't got high bit rate and we haven't been able to tell. The other one was how is the water clean up going and can you estimate how much you're able to scoop up there. Over.

FALCON Okay, Gordo. Two answers. Yes, the program - your computers have cycled and all of the water is cleaned up and we've got two full LiOH canisters plus about 1/8 of the CSM (garbled)

CAPCOM Okay. I'll get a suggestion here for what to do with it now. I'll have it to you in a minute.

FALCON (garbled)

FALCON It looks like with all the stuff we have to throw over today we're going to have to use another jettison bag.

CAPCOM Okay, Dave, you can dump up to 1/2 of one of those LiOH cans worth into the urine system if you wish. And if you can get rest the into the two cans we suggest you put the lids on maybe tape them to hold them secure, put them in the buddy SLSS bag and then jettison them in the upcoming jettison of that buddy SLSS bag stuff. Over.

FALCON Okay. Two of those tops don't come off (garbled)

CAPCOM - - Houston. We didn't copy your last

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CAPCOM transmission. If it was anything significant say again. Otherwise, don't bother to acknowledge.

FALCON I guess we just want to make sure that the tops don't come off the LiOH cans when we're getting ready to jettison.

CAPCOM Okay. Fine.

FALCON And the buddy SLSS bag will just barely hold one cartridge plus the other debris we have. So I think we're going to have to use jettison bags to put in the other. garbage. The two LiOH canisters and the other bag with the water and I think the other bag will hold the water okay. If the seams are fairly waterproof. And I just did the urine stowage if we have it.

CAPCOM Okay. That sound good to us.

FALCON I guess we have a question on the water in the helmet bag. Do you think we'll have any problem with that if the bag is hitched up if we keep it in a local vertical position.

CAPCOM Okay. We're just going around the room on that one. And we'll have an answer in a second here.

FALCON Okay.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 139:10 CDT 3:45 395/1

PAO This is Apollo Control at 139 hours 11 minutes. Dave Scott and Jim Irwin will be beginning preparations soon for the second EVA on the lunar surface. Here in the control center the flight controller team, which will be active during the EVA, are beginning to arrive. Flight director Jerry Griffin preparing to relieve flight director Milt Windler. And flight director Gene Kranz has reported he will be handling the command module during the EVA period. The CAPCOM's will be astronaut Joe Allen for the surface exploration and astronaut Karl Henize for the command module. We'll continue to standby live for further conversations between Falcon and Houston. At 139 hours 12 minutes, this is Mission Control, Houston.

ENDEAVOUR Hello, Houston. Hadley Base.

CAPCOM Go ahead, Hadley, Houston. Over.

ENDEAVOUR Okay, I've got a helmet bag that's beginning to drip so I guess it probably would be better to transfer that into the urine container, right?

CAPCOM Okay, we agree. In fact we were thinking about suggesting that so you have the helmet bag to stow the visor in later for launch. Be easier than trying to tape it down. Go ahead and stick the urine - urinal right into the bag and it should suck it right out of there.

ENDEAVOUR Okay, but we were talking about the helmet bag not the LEVA bag. We weren't going to use the LEVA bag.

CAPCOM Oh, okay. Hadley, Houston.

ENDEAVOUR Go ahead, Houston.

CAPCOM Jim, on the subject mentioned earlier about the the - your PLSS being shelved on a slant tha caused the problem you had with the flag, we don't think that's any real problem but if you're have concerned about it we think that refilling the PLSS in a vertical position and we have a procedure that we figure will take about 10 minutes total to do. We're pretty sure we'll solve that problem but we don't think there's any danger in going ahead and getting the same symptoms as you did on the first EVA but if you'd rather not, we can do this procedure to get rid of that air bubble. Over.

ENDEAVOUR Okay, Jim says he's not worried about it as long as it's no real problem. We'll just press on.

CAPCOM Okay, Dave. Hadley Base, Houston. The only two items we have remaining to brief you on are the EVA plans themselves and a - Hadley, Houston. The item that shook me there for a moment was the PRD readout when you get a chance that and the traverse plans that are hanging and so forth.

ENDEAVOUR Okay. Okay, Houston, Hadley Base here, ready to talk over the EVA with you if you like.

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CAPCOM Good morning, Hadley Base, this is Houston and we're ready to talk over the EVA.

ENDEAVOUR Okay. What do we need out to talk about - or with, maps or anything?

CAPCOM Dave and Jim, I think that actually you'll have to write very little down just file a few things away in your memory but it's going to follow naturally and I don't think there's any major complications from here on. Most of it we can - do use a checklist and your knowledge of the front and traverse rationale. I'll just take it from the top if you're ready.

ENDEAVOUR Okay, we're ready.

CAPCOM Roger, Dave. And wondered if you were going to shoot a little pool today?

ENDEAVOUR No, we're saving that for tomorrow, Joe.

CAPCOM Okay, that sounds like good news. I'm going to start with our general rationale for the 6-1/2 hour EVA we're coming up on here and then I'll get down to some details. I won't give you all the details of the traverse right now but a lot of them I think we can pick up as we go along, depending really on what we see as we travel along. Basically, the EVA will last, as I said, 6 hours 30 minutes and this is based on our experience from yesterday. Consequently, the EVA 2 traverse distance has been shortened somewhat to provide good geological exploration with a minimum of travel time. Primarily at the front. We're going to strike out for the front first just as planned. However, we're going to skip station 4 for the time being range along the front and we may very well pick up station 4 and it's corresponding activities on the way home. We're looking for craters like Spur Crater and Window Crater but I'm using these only as examples of craters that have plainly excavated front material for us and I have provided a variety of fragments to sample. We'll be -

END OF TAPE

CAPCOM We want to return to the LM with about one hour and 30 minutes remaining. And Dave, we are going to ask you to invest some few more minutes on the drilling activity. We've got fairly detailed procedures for you to follow and I'll go into those when it seems a reasonable time to do so. Jim, at the same time we are going to ask you to carry out some miscellaneous tasks around the LM, while Dave is out at the drill site. And finally, with about 45 minutes remaining, and this is a one time special good deal for you Jim, we're going to carry out station 8 activities in the vicinity of the LM. In other words, we will not do our station 8 activities on our homeward bound journey from the front. Now I'll stop here and ask for questions, and then I'll go in to some more detailed rationale for the way the traverse will break out later on. Over.

FALCON Hey, Joe. That sounds like good planning to us. We're all set. Go ahead.

CAPCOM Okay, Dave. Thank you. I'm going to go through the stations and the rationale behind some of our decisions now, starting with the first one. Egress the LM will have a couple of small house keeping chores for you to get out of the way on the Rover for us. They're basically we're going to invest this, 30 more seconds in our front steering problem. And perhaps a minute in taking up the TV antenna cable. And I'll be back to you on that a little late. Then we're going to strike out immediately for the front in other words, head south. We want to delete station 4, out bound and the rationale is, as all of us all ready know, the priority on that is considerably lower than other stations. And we may very well pick up station 4 on the way home any way. We're not going to try to range all the way down to front crater. We think there are plenty of craters similar to front along the way and the long travel time decreases our geology time along the front. Now, we want to reroute our front traverses to the area of Window Crater and Spur Crater. In other words, stations 6 and 7, the station 6 and 7 area right there in the highly counted (garble) And we're going to depend very much on the observations from the two of you and it's going to be dealers choice, your choice on exactly where you'd like to range, and where you'd like to carry out your major sampling tasks. Let me emphasize that we're looking now primarily for a wide variety of rock samples from the front. You've seen the breccias already. We think there may very well be some large crystal igneous and we'd like samples of those and whatever variety of rocks which you're able to find for us. But, primarily a large number of documented samples and fragment samples. We're going to add a comprehensive rake and soil sample someplace in this area. Once again we'd like you to try the rake but, if it doesn't work with about the first swipe

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across the surface, we'll give that up as a bad idea,
CAPCOM just don't want you to spend too much
time using the rake. I'll unkey now, and ask for any more
questions.

FALCON No questions Joe. You're really talking
our language today. Go.

CAPCOM Roger, Dave. Finally, and I've touched
on this all ready. We'll return, - Okay, on our way home,
once again we'll skip section 8 but, don't get your hopes
to high, Jim, because we're going to pick that up right
before we ingress the LM and we're just going to carry that
out closer to the LM than we had previously planned. We're
going to ask you to pick up the miscellaneous tasks around
the LM, Jim, while Dave is out working at the ALSEP site.
And finally, the two of you will start on station 8 activi-
ties at the LM together after Dave finishes the, working
around with the drill. And, that basically is it. Are
you, - let's see, let me go back through again, and comment
on a few new activities we've added to, - we'll want you to
carry out in addition to things on your check list, listed
under station 6 and station 7. And I'll have to unkey and
shuffel papers here a minute. I'll be right back with you.

FALCON Okay, give us about 5 minutes too. Will
you please Joe?

CAPCOM Roger, Dave. I'll standby for your call
here.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 425 CDT 139:50 GET MC 397/1

FALCON Okay.

CAPCOM Hadley Base this is Houston.

FLACON Go ahead Houston.

CAPCOM Roger, Dave. We'd like a rough idea of where you are in your EVA prep at this time and we'd like an OPS readout at your convenience. Just a reminder. Over.

FALCON Okay, I am with Jim right now and we'll call you in a little while.

CAPCOM Roger, thank you.

PAO This is Apollo Control at 140 hours 22 minutes 23 minutes ground elapse time. Crew of Falcon now getting prepared for second EVA of Apollo 15. All the detailed preparations inside the cabin. Getting suited up. Checking out the portable life support systems. Oxygen (garble) systems that mount on the top for a half hour emergency pressure and breathing oxygen should the primary system fail. All of this gear being checked out thoroughly by the crew prior to depressurizing the Lunar Module. Earlier the modified EVA-2 plan was discussed by the crew and spacecraft communicator, Joe Allen. We're looking again at a total EVA-2 time of 6 hours 30 minutes. Probably drop out station 4 of this traverse outbound, but may pick it up on the return if the time line looks suitable. The plan is now to return to Falcon with about a hour and a half remaining in the EVA time. To pick up some of the items that, more of a necessity. Delayed from yesterday's EVA such as drilling a thrid hole with the electric auger for the heat flow experiment and also the plan is now to move the activities for station 8 up near the Lunar Module within walking distance. Also the deployment of the United States flag, which was delayed from yesterday's EVA will be done toward the end of EVA-2. We're still up live on the air ground circuit. The crew is quiet at this time because of their rather busy activities aboard Falson, but we'll stay up live to pick up presumption of the conservation as they prepare for EVA-2. At 140 26 this is Apollo Control.

END OF TAPE

APOLLO L5 MISSION COMMENTARY, 8/1/71, 5:07 CDT, 140:35 GET, 398/1

FALCON Houston, how do you read the yaw and pitch.

CAPCOM Jim, this is Houston. Were you calling?

FALCON Yes. Just wanted a comm check, Joe.

CAPCOM You're 5 by.

CAPCOM Jim, this is Houston. Our biomed on you is a little noisy. We're wondering if you're all plugged up properly on that or if it's easy to get to those sensors still. Over.

FALCON They're all plugged up, Joe.

CAPCOM Roger. Is it your biomed there that we're reading now.

FALCON No. You're reading Dave's.

CAPCOM Okay. We're getting quite a noisy return down here. He may want to take a look at those sensors.

FALCON We're all buttoned up, Joe.

CAPCOM Roger.

FALCON Is it usable data?

CAPCOM Stand by and in the meantime, have you put tape over the canisters that are filled with water there and if so we're a little worried down here that you may have taped it so well that it's making an airtight seal now. Could you comment on that?

FALCON Put the locks back on Joe.

CAPCOM That sounds good.

FALCON My PRD reading this morning is 8029 - no. 24.

CAPCOM Roger, Jim. Copy 8024. Thank you.

FALCON And Joe, mine's 5020.

CAPCOM 5020, Dave. Thank you.

CAPCOM Hello, Jim. This is Houston.

FALCON Go ahead, Joe.

CAPCOM Jimmy, we're sitting down here scratching our heads about some data we're getting on your PLSS and we'd like to know if the PLSS was vertical yesterday evening when you serviced it or if it perhaps were leaning sharply back against something when you serviced it. Over.

FALCON Joe, when we serviced mine last night it was tilted at about 30 degrees vertical and that's long dimension was tilted vertical. Gave that information to Gordo this morning.

CAPCOM Okay. Thank you, Jim. Stand by a second. I'll be back with you in a moment here.

FALCON Houston, it was tilted such that we could get the O2 high pressure line in it at the same time we were doing the water servicing to save some time. So you can probably get a picture of the angle of it by considering the PLSS on the midstep tilted up so the O2 line could reach it.

CAPCOM Okay, Dave. Clear picture. Thank you.

APOLLO 15 MISSION COMMENTARY, 8/1/71, 5:07 CDT, 140:35 GET, 398/2

CAPCOM Hello, Falcon. This is Houston.

FALCON Go ahead.

CAPCOM Roger, Dave and Jim. We hate to hold you up here but we think we have a real problem with a bubble of air in your PLSS water Jim. And we're going to have to ask you to take a few minutes here and do a feedwater recharge on your PLSS. And I'll go over the steps which we'd like you to follow when you're ready to copy them. Over.

FALCON Rather than copy, let us get the PLSS up in position and you just talk us through it. Okay?

CAPCOM I can sure do that, Dave. I'm ready to read when you're ready.

FALCON Stand by.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/1/71, CDT 5:15, GET 140:45, 399 '1

FALCON Okay, Joe. We're ready on that recharge.
CAPCOM Okay, Jim. We hear you here. And we
want to start first with the PLSS being cleanly verticle.
And then, your first step is PLSS OX WATER OPEN.
FALCON Okay. Stand by.
FALCON Okay, OX WATER OPEN.
CAPCOM Roger. Next step. LM descent H2O CLOSED.
FALCON Okay, descent water going CLOSED.
CAPCOM Next step, connect waste management
system to PLSS primary vent.
FALCON Okay. I'll hook the waste management
system up to the primary vent. Stand by on that one.
CAPCOM Roger.
FALCON Say, Joe. Does this happen to be anything
like the procedures we have on board all ready?
CAPCOM Dave, from here on out, they're going
to be similar. I want to give you a step 4 here, when
you're ready.
FALCON Go.
CAPCOM Roger. Step 4. Connect LM H2O to PLSS
H2O fill.
FALCON Okay. That should work.
CAPCOM Okay. Dave and Jim. From here on,-
FALCON (garble)
CAPCOM Roger, thank you. It's going to be line
9 to the end of your check list. List recharge procedures,
and I'll read them to you if you want. I have them right
here.
FALCON No, we can do it, Joe.
CAPCOM Okay, you should be starting with line
LM descent H2O open.
FALCON Give me a page.
CAPCOM Roger. Page 5 - 6.
FALCON Okay. I've got it.
CAPCOM Okay. And the line is LM descent H2O
OPEN.
FALCON Okay. We're right with you. Okay we'll
go ahead from here with the check list.
CAPCOM Roger. Follow it right through to the
end Davey. Thank you.
CAPCOM Roger.
FALCON Okay. Houston those steps are complete
down through the left column of page 5 - 6.
CAPCOM Okay, Dave. I guess you pick up business
as usual then. And we're standing by. However, Dave
could you put pressure on the lower of your 3 EKG sensors.
We think that may be the problem with our signal down here.
And that's just pressure on that sensor from the outside.
FALCON Okay, the sterno.
CAPCOM I think that's the one. And surgeon
tells me, it's on the left side, Dave.

APOLLO 15, MISSION COMMENTARY, 8/1/71, CDT 5:15, GET 140:45, 399/2

FALCON Okay, we've got pressure on it now.
CAPCOM Okay. Try pressure on one of the 2
upper ones please.
FALCON Okay.
CAPCOM Dave, which of the upper ones have you
touched now, both of them?
FALCON That's the only way we can get to them
right now, Joe.
CAPCOM Dave, could you physically move (garble).
We've lost the signal, or something.
FALCON The pressure's removed right now, Joe.
CAPCOM Okay. Thank you Jim.
FALCON And Joe, the OPS check out as 5700 on mine
and 5600 on Jim's.
CAPCOM Roger. Thank you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/1/71, 5:31 CDT, 140:56 GET, 400/1

FALCON Houston, how does the biomed look?
CAPCOM Dave, the story on the biomed is essentially the following. We've got a good heart rate on you, or at least readable, when you're perfectly still. Otherwise, we're not able to pull the rate out of the signal return that we're getting. And we've talked it over here. You're going to be the pacing item on this, so we're going to give you a go ahead and rely on your own good judgement to keep us posted on crew status. We're all aware that this EVA is physically a fairly easy EVA with exception of the drill work coming up towards the last and we may have more information regarding your biomed sensor we'll give to you then. Is that reasonably clear?
FALCON That's fine, Joe. I'll cool it all the way.
CAPCOM Roger, Dave. Thank you. And press on.
FALCON Okay.
CAPCOM Jim, it is important that we have your biomed data - -
FALCON Yes. I just - -
CAPCOM - - Are you plugged into it yet?
FALCON Okay, he's switching now you'll take a look at it.
CAPCOM Okay. And it's important - -
FALCON I guess the sensors are nice and new today.
CAPCOM Okay. That sounds good.
FALCON Did you have any trouble with mine last night, or is it just since I put the suit on?
CAPCOM Dave, we may have dinged them when the suit went on. They looked real fine all night long.
FALCON Okay.
FALCON Houston, could you give us a hack on where we stand relative to the time please?
CAPCOM Roger, Dave. Sure will. Could you give us a quick estimate of where you are on your EVA prep card.
FALCON Oh, roger. We're half way through LM - LMP PLSS donning.
CAPCOM Okay. I'll be back at you in a minute with some numbers.
FALCON (garbled) guess what I'm asking Joe is where are we relative to when you plan for us to come out. You know our mission timer isn't working so I'd just like to know when you expected us to come out so we know how to pace it.
CAPCOM This is Houston. We estimate you should be climbing out of the LM about an hour from now which

APOLLO 15 MISSION COMMENTARY, 8/1/71, 5:31 CDT, 140:56 GET, 400/2

CAPCOM would make it about a quarter to 7 Houston time. However, we're standing by and whenever you're ready to go please press on. We are running a little bit behind the nominal time right now.

FALCON Okay. Well, my question was when was the nominal time?

CAPCOM According to the theoretical plan - -

FALCON Okay. Just wanted to know.

CAPCOM - - in front of us you're climbing out of the LM right now.

CAPCOM And Jim be advised your biomed data looks quite clean to us.

FALCON Thank you, Joe.

CAPCOM Jim, this is Houston. I don't know if you copied my last transmission. Your biomed data is quite clean.

FALCON Roger, Joe. I copied.

PAO This is Apollo Control 141 hours 10 minutes ground elapsed time. There likely will be a delay of anywhere from a half hour to an hour in EVA-2 because of the delays in meeting the timeline. The feedwater tanks on the lunar module pilot's portable life support system had to be topped out because apparently the system or the backpack had been charged with water yesterday afternoon after EVA-1 while the backpack was at a slight angle of about 30 degrees. Apparently this causes an air bubble to form in the system. And this air bubble had to be bled out much like bleeding the air from an automobile's brake system. And then the tank topped off with feedwater. Also there's been a lack of really usable biomedical data from the commander, particularly the heart rate and respiration rate and attempts were made to put pressure on the sensors attached to the chest of Dave Scott to improve the signal quality. But it's still rather sporadic. But as Scott said, he planned to cool it, if he felt he was over exerting himself. LM cabin pressure holding now at 5.1 psi. We'll stand by as preparations for EVA-2 continue up and live on air/ground with Hadley Base. At 141:12, this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 547 CDT 141:12 GET 401/1

CAPCOM Hello Falcon this is Houston.
FALCON Go ahead, Joe.
CAPCOM Jim and Dave, while your working around there I've got your morning science report. We just learned here that the X-ray spectrometer people have generated a, or are about to generate a compositional map of the cental belt of the moon based on Al's data. You'll also be interested to hear that the pan camera has photographed at high resolution, the landing sight at Hadley Rille and we're thinking now when we get those pictures analyzed, if it looks good maybe we should try landing there. Over.
FALCON We copy. - Sounds like a good idea.
CAPCOM Not half bad.
FALCON There's lots more to do up here than we could ever handle.
CAPCOM I'm not so sure, Dave. Looks like you're handling that pretty well.
FALCON Hey, Houston. In taking a look at things on the PLSS straps we noticed that Jim's youo had failed yesterday too. So we'll have to do a little improvising in there today.
CAPCOM Roger, Dave. We copy that.
FALCON Okay Houston, Hadley Base here. Getting ready for a COM check with the PLSS's if you're ready.
CAPCOM Roger.
FALCON Okay. We'll start out and give you a call in a minute here.
CAPCOM Roger, Dave.
FALCON Mode to VOX. VOX sensitivity to max BHFATR in B receive BCB16, Z-Autio open and you can go back to the PLSS COMM. Okay, CB16, Z-Autio close (garble) maintain right verify and mode A wheel counter clockwise. (garble) to momentary, PLSS 02 pressure gage greater than 85. What have you got?
FALCON Data COM check with me in Houston.
FALCON Nope. How about your (garble) this PLSS mode A. Cycle it back and your (garble) audio closed? You're not triggering are you reading me okay? Your VOX isn't coming through at all. How about PTT? No. Okay let's go back to VHF a transmitter to voice. A receiver on, B transmitter to off, B receiver on. Dave, give me a call now. No. Say Houston. Don't seem to have any aide tone on or any transmission out of the LMP's PLSS on A.
CAPCOM Roger, Dave. We copy your comment loud and clear. We're receiving you clearly. We agree we don't have anything from Jim yet and we're looking at it now.
CAPCOM Dave and Jim this is Houston. We'd like for your first to verify the RCU connector to the PLSS.

APOLLO 15 MISSION COMMENTARY 8/1/71 547 CDT 141:12 GET 401/2

FALCON Okay we'll verify it. Stand by. Check it again.

FALCON Yes, Jim's reading you okay. So it must be connected.

CAPCOM Dave and Jim, could you go back to the Audio portion of your cue card there, Audio LMP and check those few steps for us, please.

FALCON Alright. S-band to TR, ICSTR relay on

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 141:37 CST 6:12 MC 402/1

FALCON Alright. The S Band to TR. ICSTR. Relay ON. Load the Box. Box (garble) BHFA to TR. B Receive. Okay, we've verified the A and B Transmitter and Receiver, Telemetry biomed ON. Tell you, no luck Houston; maybe, might go into the Circuit Breaker.

CAPCOM Dave, I guess we'll go back up one more step and verify the power-down circuit breaker configuration, please.

FALCON Okay. Jim says you're coming in very weak Joe. We'll verify the power-down circuit breakers.

CAPCOM Why don't you verify Jim, as usual.

FALCON Okay. Both verified.

FALCON You said both of those were verified?

CAPCOM Thank you Dave. We're thinking.

CAPCOM Jim, could you check the suit connector please?

FALCON (garbled)

FALCON Okay. Jim's reading you, so the suit connector must be connected. (garble)

BOTH Roger, Roger. We agree with that; but we assume also that he is receiving us very weakly. Is that correct?

FALCON That's correct.

CAPCOM (garbled) cycle that, Jim.

CAPCOM Falcon. Request that you unstow Jim's PLSS antenna, please.

FALCON Okay. Here.

FALCON Okay, Joe, That was the problem. I'm afraid to tell you but Jim's antenna is broken; and it was broken yesterday when we got in, when we first started out on the operation there was a big nick out of the antenna, which we subsequently taped; and now, just below that nick it has broken off, and I don't know how it got there, but when we first looked at the OPS antenna had about half of it nicked out. We did tape that yesterday.

FALCON Okay. There we go.

CAPCOM Roger Dave, we copied that.

FALCON I'm reading you loud and clear. Okay?

CAPCOM Okay Jim. We got your call then.

FALCON I guess you didn't--Joe, what I'm doing now is holding Jim's antenna together.

CAPCOM Roger Dave. And when you hold it together we can read you loud and clear; so that's the problem. I guess we need a tape job on that antenna.

FALCON Yeah; I hope we, I hope I can get it taped for you.

CAPCOM In other words you want to tape it and leave it (garbled) Leave it erect, you mean leave it up.

CAPCOM Bring your volume down some.

FALCON Okay, let me (garble) tape out -

FALCON (garble) the tape in operation this morning.

CAPCOM Roger Jim; and we're reading you five five, babe, when that things connected. It sounds like that's the problem.

FALCON Yeah, no doubt. You just stand there now.

FALCON Yeah, I know it; but I don't know how we're going to do that cause this - -

CAPCOM Jim, could you go to OFF on your mode select switch while you're taping?

FALCON Okay. Ease off, Jim.

FALCON Okay, Dave. And we're standing by for progress, as to how that goes.

FALCON Okay, Joe. I think we're going to take the top nitch off the antenna and use it as a splice.

CAPCOM That's the old splint trick, you mean.

FALCON Yeah. We'll give that a try, cause unfortunately the antenna is broken right off at the root.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 141:43 CDT 6:18 403/1

FALCON Right there.

CAPCOM Dave and Jim, we're scratching our heads on that down here and as you know all we need really is a small metal to metal connection between the broken piece and the root of the antenna coming out. Dave, you may want to tape the antenna over across the top of the PLSS. If you think that'll be mechanically more secure than taping it straight up. We'll rely on you to decide on that one.

FALCON Okay, Joe. Let's let Jim come back up on comm and lay the antenna across here and see how it works.

CAPCOM Okay. And -

FALCON (garble) back to your left.

CAPCOM And Dave, while you have the tape up there from the sound of things, maybe you'd better put some up in your pocket for later.

FALCON Wait a minute. Okay, now standby a minute, Joe.

CAPCOM Roger.

FALCON Give a call, Jim. Now you got it.

FALCON Joe.

CAPCOM Okay, Jim. I got one word there, don't forget your mode switch.

FALCON Yeh, we're okay. Think of something here. Dropped the tape. Okay, Joe, it looks like the best we're probably going to do here is to be able to tape it up so we have the contact and then leave the PLSS antenna down rather than erecting it. I'm afraid if we erect it, why there's not much room to put tape in there and it may fall off and then we'd be out of business.

CAPCOM Roger, Dave. We agree with that. And Dave and Jim, you should be advised that there's a very good reason to believe that when you get out on the surface near the LCRU, Jim, you'll be able to transmit as well as receive. Over - even without the antenna. Over.

FALCON Okay, that sounds good.

FALCON Okay, standby, we'll do it again. Can you connect it in the BAT A. All right. Too loud.

FALCON Yeh. ARR, Houston, how do you read LMP?

CAPCOM LMP, you're loud and clear.

FALCON Okay, very good. Okay, it's still too loud, you got a squeal.

FALCON Yeh, I'll drop it down a little bit. How's that?

FALCON That's better. Okay CB 11 comm, CDR 080 being connected to PLSS COMM.

FALCON Okay, I'm in (garble) I have a press flag and 002 momentary. S gage and how do you read, Jim?

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 141:43 CDT 6:18 403/2

FALCON I read you loud and clear.
FALCON Okay, you going to check with Houston?
FALCON Houston, how do you read? (garble)
CAPCOM Dave, we - Dave and Jim, we read you both
loud and clear.
FALCON Dave, they read me loud and clear.
CAPCOM (garble)
FALCON Push mode for you to B and me to A. Okay,
how do you read, Jim? Loud and clear?
FALCON Okay, you're loud and clear to me and Houston,
how do you read the CDR?
CAPCOM Roger, you're both five by.
FALCON Okay, let's both go to AR. AR.
FALCON Okay, AR. You're loud and clear to me, how
me to you?
FALCON Same.
FALCON Okay, Houston, how do you read the LMP and
CDR again? How's your TM?
CAPCOM Okay, Dave, we're loud and clear on both and
we're GO for the next step.
FALCON Okay, my PLSS 02 quantity is 90 percent, how
about yours, Jim?
FALCON Reading 92.
FALCON Okay. CB 16 ECS LCG pump closed.
FALCON Closed.
FALCON Okay LCG closed as required. TB16 ECS
cabin depress close, verify.
FALCON Verified.
FALCON Suit band DELTA P open.
FALCON Opened.
FALCON Suit band 2 open.
FALCON Opened.
FALCON Okay, verify ECS caution and H2O with lights
ON about a minute and there they come.
FALCON (garble)
FALCON (garble) gas diverter pull egress verify.
FALCON That's verified.
FALCON Gas return egress verify.
FALCON That's verified.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 141:53 CST 6:28 MC 404/1

SCOTT (garble)
CAPCOM That's verified. Cabin gas return, Egress
verify.
SCOTT That's verified. (garble) circuit relay (garble).
That's verified. KOPS Connect, LOP first to isolation to suit
Disconnect.
IRWIN (garbled) suit disconnect.
SCOTT Okay. Why don't you slip around here.
SCOTT (garbled) OPS
IRWIN That water is cold isn't it?
SCOTT Okay.
IRWIN OPS O2 hose to PGA blue (garble)
SCOTT I'll turn out the LTG now.
IRWIN Okay. It's closed and locked. It's (garble)
SCOTT (garbled)
IRWIN The current is up again. From the same
place, the post stowage handle.
SCOTT Okay, retreat purge valve, verify CLOSED
and lock pan in low. Delta purge valve in red.
IRWIN Okay. The purge valve is in and marked
and locked.
SCOTT Okay, diverter valves on vertical. Okay,
repeat on you.
IRWIN You're going to have to - yes, you're just
going to have to -
SCOTT Disconnect.
IRWIN Well, 2 hoses just sort of drifted up there.
Okay.
SCOTT I'll disconnect your hoses - I'll disconnect
this O2 hose. Dump.
IRWIN Okay. Come in low. Okay. All locked now.
And the pins in and locked.
SCOTT Okay, PG diverter valve to vertical. Take
a little drink. Turn the descent water off?
IRWIN (garble)
CAPCOM Dave, that descent water was turned off on
your PLSS recharge exercises.
SCOTT Rog. We figured that out. It's working
okay.
CAPCOM Roger.
SCOTT Okay, vent water closed. Stow that hose
properly, I mean put it in holster and all. Okay. Cables
too.
IRWIN Okay, stowed.
SCOTT Okay, how about PLSS now? Okay position
mike (garble) puts me into ON, right vent clear. Okay, it's coming
on. Good tone and voice clear. Okay, (garble) is clear.
IRWIN (garble)
SCOTT Let me get your water. And your foot stick.
Here, I'll wind it up.
IRWIN You wind it up and I'll push it.
SCOTT It's lined up.
IRWIN Okay.

IRWIN There, closed and locked. Back flap.
 IRWIN Okay, front flap. I did it. Okay, watch
 my water spigot.
 SCOTT Yeah.
 IRWIN Okay. You have to push it some.
 SCOTT Oop, did it.
 IRWIN That was easy.
 SCOTT Yeah.
 IRWIN Get the back flap first?
 SCOTT Believe it - not in.
 SCOTT You'll have to rotate the helmet, too.
 Shift it just a little bit. No, too much. Shift it back
 just a little bit more, a little more to the right, a little
 more, a little more. That's good. Back a little to the left.
 That's right on.
 IRWIN Okay. Okay, Secure the (garble) strap.
 IRWIN And two.
 SCOTT Left and right.
 IRWIN Okay. LPG is cold yeah. Okay CB16 ECS LG
 pump OPEN.
 IRWIN Okay.
 SCOTT Get back to your little corner. LCG pump
 coming open. It's open now.
 IRWIN Okay. Disconnect LM water hoses and connect
 the PLSS water hoses.
 SCOTT And work.
 SCOTT Okay, mine's closed and locked.
 IRWIN Mine's closed and locked.
 IRWIN A Secure the hoses - the LM hoses. Did it work.
 SCOTT Yeah.
 IRWIN Push them just as far back as you possibly
 can, Dave.
 SCOTT Yes, they're snapped in ECS handhold. I think
 they'll hold today.
 IRWIN Okay, you got your hoses stowed?
 SCOTT Hoses are stowed.
 IRWIN Okay, go a 180 here and we'll check all
 the connectors.
 IRWIN Okay, read to me.
 SCOTT Okay, helmet and visor alined and adjusted.
 IRWIN Rog.
 SCOTT 02 connectors, 3 locked.
 IRWIN Okay.
 SCOTT Locked. Locked.
 IRWIN And locked.
 SCOTT Purge valves 1 locked.
 SCOTT Okay, let me put the booties on here.
 IRWIN B purge valve is locked.
 SCOTT Water connector locked

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 142:00 CDT 6:34 405/2

IRWIN Water Connectors locked. Comm connector.
Comm connectors locked.

SCOTT PGA diverter valve, vertical.

IRWIN Vertical.

SCOTT Okay, read to me.

IRWIN Okay. Helmet and Visor alined and adjusted.

SCOTT I do.

IRWIN Okay, 02 connectors 3 locked.

SCOTT Okay 3 are locked.

IRWIN Purge valves 1 locked.

SCOTT Purge valve is locked, water connector
locked.

IRWIN Water connector is locked.

SCOTT Comm connector locked

IRWIN Comm connector is locked.

SCOTT Diverter valve vertical.

IRWIN Diverter valve is vertical.

IRWIN Okay, let's take another look at the circuit
breaker configuration.

SCOTT Okay (garble) for EVA decals.

IRWIN Okay, mine are configured.

SCOTT And mine are configured.

IRWIN Okay. Donn EVA gloves and work.

SCOTT That graphite makes the hands
slide in pretty easy doesn't it?

IRWIN It doesn't do too good on the PLSS
connectors though, does it? It's a little bit - okay I got 2 on and
locked. Come over and check mine when you get through.

IRWIN Still working.

SCOTT Call if you want a hand.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/1/71 GET14208 CDT643 406/1

FALCON It's almost stiff. Hey Houston, lock? Okay, come check GARBLE been there. Okay, doing a lock in a lock okay. Keep COMM SEP. Hey,PGA diverter to MIN verify.

FALCON Verified.

FALCON Okay, and PLSS pelt on to the right.

FALCON It's going on. Okay, mine is running.

FALCON Mine is too.

FALCON Okay, press REG A and B to EGRESS.

FALCON A and B going to EGRESS.

FALCON And we need a pressure integrity check. So next step is PLSS O2 to on.

FALCON O2 can get it. And my PLSS O2 is on.

FALCON And mine is on.

FALCON Okay and the PRESS flag should clear in 31 and 34. Come up.

FALCON Mine's clear.

FALCON Jim did you pressurize that quick?

FALCON No I'm sorry GARBLE.

FALCON Yeah, mine too.

FALCON Jim, off the peg.

FALCON Yeah, my flag is clear?

FALCON The flag is clear.

FALCON Okay, I'm stable at about 3.8. How about you.

FALCON Same here.

FALCON Okay I can get that old O2 valve let's turn them on and do a little check.

CAPCOM Okay, Falcon. We'll mark in a minute.

FALCON Dave, mine's on.

FALCON Mine's off.

FALCON Okay.

FALCON Standby, Houston, we'll take your call when the minute is up.

CAPCOM Roger.

FALCON Cabin mark 1 minute. Mickey's big hand went above his head.

FALCON Okay, I'm reading 3.7.

FALCON Okay 37.

CAPCOM O2 back on. GARBLE is on.

FALCON Okay. And verify the O2 flag is clear. Mine is clear.

FALCON Mine is clear.

FALCON Okay, Houston. How do things look to you down there?

CAPCOM Okay, Falcon, you are go for DEPRESS.

FALCON Roger, go for DEPRESS. Okay, Jim, CB16 ECS CABIN REPRESS OPEN.

FALCON Okay CABIN REPRESS is OPEN.

FALCON CABIN REPRESS VALVE to CLOSE.

FALCON CABIN REPRESS closed.

FALCON Okay - I've got a little tone.

APOLLO 15 MISSION COMMENTARY, 8/1/71 GET14208 CDT643 406/2

FALCON Okay forward dump valve open and then auto
at 3.5.
FALCON Okay. GARBLE.
FALCON Cabin pressure I've got it.
FALCON Okay, I'm going open.
FALCON Okay.
FALCON Open 50 4.5 4.2 Mark 3.5.
FALCON Dave I've got them. Okay.
FALCON Mark 3.5. Verify cabin at 3.5. Okay camera
is at 35. Two circuits locked up at about 44. My PGA is
coming through 5 and decaying, and let's put down a watch. Okay.
Bring forward dump valve to open.
FALCON Okay, going open.
FALCON Okay. Verify TOTO and H2O flag in about 12 to
17.
FALCON Okay 25 2.0. Easy does it. .5. .5.
What's your dump gage?
FALCON 1051 yeah so far so.
FALCON We're about down to .2. Still reading about
51.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/1/71, 6:50 CDT, 142:16 GET, 407/1

SCOTT Do you find one also.
IRWIN Jumping down about 5.
SCOTT Yes.
IRWIN We'll breath it down.
IRWIN Take them all at this rate.
CAPCOM And (garbled) look right on.
SCOTT Okay. Thank you.
CAPCOM Jim, your PLSS water recharge cured
that problem we had yesterday completely it looks like.
IRWIN Good.
SCOTT It was worth the effort then.
IRWIN Those tones are a little disturbing.
IRWIN Okay. We'll personally open the forward hatch. Maybe I can get that if you'll slip over there up tight about as far as you can go. Careful not to get hooked. That's it. Okay.
SCOTT (garbled) That's it. Can you reach around and hold the hatch so it doesn't blow shut.
IRWIN I got it. No sweat. It's a little easier today. I'm getting in practice.
SCOTT Yes. Okay. Forward hatch is partially open and final prep to egress put primary water open.
IRWIN Let's see.
IRWIN Let me see if I can get around the hatch here and give you some more room. Maybe I can get my arm in back of it. Yes. I've got my arm back there. No sweat, Dave.
SCOTT Good.
IRWIN Find the control. Okay. Mine's open.
SCOTT Doing okay?
IRWIN Just about. I think it's on. Yes.
It's on.
SCOTT Okay.
SCOTT Okay. My gloves feel a lot better today.
IRWIN Stretched them a little bit yesterday, Dave.
SCOTT Yes. I think you're right.
IRWIN Okay. PLSS IN2 cooling sufficient.
SCOTT After we get the water going. And verify the (garbled) status. We might do that. The CS in preamps.
IRWIN Okay.
SCOTT Look at that. Forward the clear water ports. Okay. Your water ports clear, Al. I mean clear, Jim.
IRWIN Yes.
SCOTT (garble) tape. Over there by your left Elbow.
IRWIN Why don't we take both.

APOLLO L5 MISSION COMMENTARY, 8/1/71, 6:50 CDT, 142:16 GET, 407/2

SCOTT Yes. We will. In case I drop one
Stick it right on the top checklist. Jim, my water flag is
(garbled)

IRWIN Okay.

SCOTT Okay, Houston. How does everything
look to you down there.

CAPCOM Fine, Dave.

SCOTT Okay.

CAPCOM Okay, Dave. Be advised you're go for
EVA.

SCOTT Okay. Thank you. Hey, Jim, let me
get the old hatch open here if you can (garbled)

IRWIN It turned the other way, Dave.

SCOTT Okay.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 657 CDT 142:23 GET 408/1

IRWIN Okay I'm around. get the hatch open
a little farther today.
SCOTT Oh yes that's much better.
IRWIN Okay I'm going to come around this way
today. Little easier.
SCOTT Just made it.
IRWIN Okay.
SCOTT Okay.
IRWIN (garble)
SCOTT Okay. Now you can go down - you're hung up on my
RCU.
SCOTT How does that look to you. Okay?
IRWIN Yes that looks like you're pretty well cleared
there. You're well centered. I could get your antenna right now
if you'd like.
SCOTT I don't really care, okay.
IRWIN Hold right there?
SCOTT Yes.
IRWIN I'll hold right here, you can get it. Your antenna
is up.
SCOTT Okay, you might check the -- the water
gun came out again.
IRWIN Sure did.
SCOTT Okay.
IRWIN (garble).
SCOTT Yes, do that, Jim.
SCOTT Okay, Houston, I'm out on the first string
of ladder and we'll take care of the jettison procedures here.
CAPCOM Okay, Dave. According to our calculations
here, just about field Hadley Rille with water.
SCOTT Yes, sorry to say.
IRWIN Okay. Got you.
SCOTT That aboy.
SCOTT One can is down.
SCOTT That's all right, Jim. Just -- just (garble)
SCOTT (garble).
SCOTT That's good. I got it.
SCOTT The canister going down.
IRWIN Okay, (garble).
SCOTT That aboy.
SCOTT Other can is down.
IRWIN (garble).
SCOTT Yep.
IRWIN (garble) I got it.
SCOTT Okay, get down. And if you can hand me
B - -
IRWIN Stand by.
SCOTT (garble) that's it.
IRWIN I got her?

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 142:23 CDT 6:57 408/2

SCOTT Yeah.
IRWIN Good.
SCOTT Okay, down the ladder to the plains of Hadley.
SCOTT (garble).
CAPCOM Jim, this is Houston. What's the request?
SCOTT Good.
SCOTT Go ahead, Joe.
CAPCOM Roger, Jim. We're seeing some extortions
in your DELTA P, the glycol pump 1. We'd like for you to
pull the auto transfer circuit breaker on that glycol pump
and select pump number 2, over.
IRWIN Okay, stand by.
IRWIN Okay, I'm pulling auto transfer now and
I'm selecting pump 2. Is that affirm?
CAPCOM That's affirm, thank you.
SCOTT Okay, pick up the pallet.
SCOTT Oh, boy is it easy and fixed. Aye.
SCOTT Okay, PLSS RLH 10 check the pins are in.
SCOTT (garble).
IRWIN See the green come.
SCOTT Yeah, the green?
SCOTT Okay. Transfer the old pallet.
CAPCOM Sounds good.
SCOTT Don't have to put an LOI H in it. So, I
guess it makes it easy.
IRWIN So does plenty of food in a day.
SCOTT Yeah, that's a good idea.
SCOTT (garble).

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 142:31 CDT 7:05 409/1

FALCON Joe do you want, before I get out do you want to close the auto transfer? (garble)

CAPCOM Standby Jim. Standby on that. I think we probably will. I'll give you some word shortly.

IRWIN Okay, I'll call you before I get out.

CAPCOM Roger. Okay, Dave, How're you doing?

SCOTT Oh, I'm doing just fine, Joe. I'm getting the high gain antenna squared away for you hopefully.

CAPCOM Okay. And while you're working there, Dave, you did such a beautiful job on fixing Jim's PLSS antenna we've got another Walter Mitty repair job. We'd like for you to carry out for us please on the cable lead from the high gain antenna to the LCRU and when you think you are at a good place to do that I will go through a description of what we need.

SCOTT Gee, I'm right there, Joe.

CAPCOM Roger, Dave. Basically our camera keeps connecting.

SCOTT Joe, I'm going to put -

CAPCOM Our camera keeps hanging up in that cable and we'd like for you perhaps, if you think it is feasible to tape a part of the cable below the fastening device on the staff of the high gain antenna. If you think a piece of tape right there might help, we suggest you go ahead and do that now.

SCOTT Joe, I just completed that little task. It's all done.

IRWIN Dave if you are clear I'm going to pitch the pallet out.

SCOTT I'm clear, Jim, and Joe, I'm in a position to get out - let me know what the final configuration is on the glycol pumps.

CAPCOM Jim, the best I can do for you right now is ask you to standby one minute, we're going to make a final decision.

IRWIN Okay.

CAPCOM And Dave as you might guess, when Jim comes out you can delete that step to deploy his antenna.

SCOTT Yes sir. Will do.

CAPCOM I have a very keen sense of the obvious.

SCOTT Oh, that's a good reminder, Joe.

IRWIN Don't worry, I wouldn't let him do it, Joe.

CAPCOM Shows you are thinking.

IRWIN But I sure would - time's awasting Joe.

Going to get way ahead of me, Dave.

SCOTT Right.

CAPCOM Okay, Jim, requesting you go back to pump number 1.

SCOTT GARBLE a little bit.

SCOTT Okay, going back to pump 1.

APOLLO 15 MISSION COMMENTARY 8/1/71 GET142;31 CDT7:05 409/2

CAPCOM Okay, select pump 1, Jim, and then close the auto transfer circuit breaker. Close the circuit breaker when you are on pump 1.

IRWIN Okay select pump 1.

IRWIN Okay auto transfer closed, at I'm egressing.

CAPCOM Roger. Sounds good.

IRWIN Okay, I'm down.

CAPCOM Roger, Jim, copy. Dave, this is Houston.

SCOTT Okay, Joe, let me review the -

CAPCOM Go ahead.

IRWIN Okay, underneath the CDR's seat pan I have the 500 millimeter with MAG M attached. I have MAGS OBOE PAPA and KILO and MAGS FOXTROT and EPSILON (I guess that goes with better things) and I'll put Delta on the 16 millimeter here in a minute.

CAPCOM Roger. Copy that clearly, Dave, and when you are ready to drive the rover I've got some words to lay on you about getting those front wheels unstuck.

SCOTT Okay, standby Joe, let's - I'll give you a call.

CAPCOM Okay.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET14239 CDT0713 410/1

CAPCOM Dave, as you climb on the rover, we'll want all the meter readings before you start pushing in circuit breakers please, and I'll remind you.

SCOTT Okay.

IRWIN I've got one for you real time here Joe. It says to put the battery in this plus Y foot pan in the shadow. We don't have the shadow in the plus Y, should I put the battery over in say the plus Z.

CAPCOM Sounds like a good fall back procedure, Jim.

IRWIN Okay.

SCOTT Okay Joe. I'm about ready to change the LCRU battery now.

CAPCOM Roger.

SCOTT Okay, the power is verified off.

CAPCOM Roger.

SCOTT Okay, no problem with the change.

IRWIN I see 2 is on the table.

CAPCOM Thank you Jim.

CAPCOM And Dave, we want meter readings before the circuit breakers get closed, please.

SCOTT Alright. Reading, all of them are off scale low, Joe. All of course except the battery volts about 71 on number 1 and number 2 is still zero.

CAPCOM Okay, copy. That was an easy reading.

SCOTT Okay, circuit breakers are coming in. All except the ox.

CAPCOM Roger.

IRWIN Okay, on the organic sample is closed for SRC 2.

CAPCOM Thank you.

IRWIN Let's see, Joe, we still have bag 2 on the right side of the hand tool carrier. Should I put it temporarily under my seat?

CAPCOM You can if you want, Jim. Sounds good.

SCOTT And Mag Delta is on the 16 millimeter and it seems to be working okay.

CAPCOM Okay, great Dave. Thank you.

SCOTT Good, Okay.

SCOTT And Joe, I'm in a position to take another crack at that steering if you'd like to talk me through the procedures.

CAPCOM Okay, Dave. We want you to exercise the forward steering switch by cycling from bus A to bus Z and back several times and then stop with the switch finally at bus Charlie.

SCOTT Roger, it did work.

IRWIN Joe I'm going to take bag number 3 off the back of the pallet, put number 6 there so we can keep the number straight.

APOLLO 15 MISSION COMMENTARY 8/1/71 GET14239 CDT0713 410/2

CAPCOM Okay.

SCOTT And steering forward is now in bus Charlie and I cycled it three times.

CAPCOM Okay Dave. Now proceed on with your normal power up cycle if you haven't already, and give me a call when you're ready to start driving.

SCOTT Okay, well we got a few things, Jim still has a few things to do. I just thought I'd make sure of other little asundry items and I could.

CAPCOM Okay Dave. Basically the rest of the procedure is just to cycle the forward steering circuit breaker open and then close and then attempt forward steering. You can do that with your power on, and if there's no forward steering we're going have to ask that the forward steering switch be turned off. Do you copy?

SCOTT Roger.

IRWIN Hey Joe, I'm putting bag number 7 on the right hand side of the tool carrier.

CAPCOM Roger, Jim. Sounds good.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/1/71, 7:22cdt, 142:47get, 411/1

IRWIN Then we'll be transferring some core tubes.
CAPCOM Rog.
IRWIN Still have the three core tubes in there.
two bags of sensors.
CAPCOM Dave, when convenient, we'd like for you
to confirm for us DMI wide band and LCRU on INTERNAL, please.
SCOTT Okay, Joe. Just a sec.
SCOTT Okay. Okay the blankets are open a hundred,
but internal PM1WB.
CAPCOM Roger.
IRWIN And the SCSC is going into my seat band -
seat bag; also have a lot of bags under my seat, Joe.
CAPCOM Okay, Jimmy, I hope we can fill some of
them.
IRWIN Rog. Oh, we'll do our best.
SCOTT There. Get the lens brush out. Got to
take care of those lens. Say, that works pretty good.
IRWIN Work good?
SCOTT Yeah, does it ever. Bright and shiny.
IRWIN Say, you still have some sample bags on
your camera, don't you?
SCOTT Yeah, so do you, Jim.
IRWIN Better put these under the seat then.
SCOTT Okay.
IRWIN Why don't I just put one under your seat
and one under mine.
SCOTT Put it - yeah. That's good.
SCOTT I'll tell you that lens brush really does
the trick.
IRWIN Yep.
CAPCOM Hint's the name, Dave.
SCOTT Say again.
CAPCOM Roger. I say Hint's the name.
SCOTT Oh, rog. Hint's the name.
SCOTT Well, our cameras, as you might have ex-
pected, got pretty dirty yesterday. As a matter of fact, we
were having to wipe the dust off of the settings everytime we
took a picture so we could see it, and the lenses got pretty
dusty, but they're all cleaned off now.
CAPCOM Yes sir, we copied and it sounds good now.
SCOTT Give me a call when you're ready, Jim.
IRWIN Yeah.
IRWIN Still sorting out the bags.
SCOTT Okay. Better to have them right.
SCOTT Get to my tongs, here.
SCOTT Okay.
IRWIN Okay, Dave, I guess I'm in a position here;
I got in, bag number 2 on the right side - position to put
your gear on you.
SCOTT Okay. Gear on me.

APOLLO 15 MISSION COMMENTARY, 8/1/71, 7:22cdt, 142:47get, 411/2

SCOTT Okay, stand by one, Jim.
IRWIN Okay. In the meantime I'll look at the seat belt. See if I can do anything with it.
SCOTT Okay.
IRWIN Adjust my throttle all the way on my seat belt.
SCOTT Okay, I think without the extension handle. It'll work okay.
CAPCOM Dave and Jim, this is Houston. Are you putting the collection bags on now?
IRWIN Yep. Just starting.
CAPCOM Okay. We think you should wind up with collection bags 3 and 7 on your PLSSs and not collection bag 2, which still should be under the seat.
CAPCOM I'm sorry, not on the PLSSs on the hand-tool carrier. I called that incorrectly.
IRWIN Uh, two should be on the hand-tool carrier, right Joe?
SCOTT Yeh.
SCOTT On the PLSSs, Joe, we're going to put on number 2 and number 5, just like in the uh - -
IRWIN No that's - no that's wrong.
SCOTT Huh?
IRWIN That's wrong.
SCOTT Oh, you changed it, huh?
IRWIN Somehow we got bag - the wrong gear's in bag 2.
SCOTT How did that happen?
IRWIN It still has the core tube - tubes in it.
SCOTT Oh, you needn't get that - I'll get bag 3.
IRWIN Okay.
SCOTT Jim.
CAPCOM Okay, Jim, that's right on. You understand.
SCOTT No deal.
SCOTT Bag
IRWIN Okay.
SCOTT Okay, Joe, bag number 162 has that little glass aggie in it.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 142:56 CDT 7:30 412/1

SCOTT Drilling of (garble).
IRWIN Okay.
SCOTT Joe, bag number 162 has that little
glass aggie in it.
CAPCOM Roger, Dave. You never walked past it.
Beautiful.
SCOTT Okay, okay. Here we go.
IRWIN Another couple of little samples that were
sitting there.
SCOTT (garble) up.
IRWIN (garble) Okay, hand me the hammer.
SCOTT Okay, hammer is on.
IRWIN Hammer.
SCOTT Hammer.
SCOTT Okay, the rammer is on.
IRWIN Yeah, I'll get the core tubes?
SCOTT Okay.
CAPCOM You're being loaded up there. Can you glance
over and see -- confirm for us that the LRV batt covers have
closed automatically.
SCOTT The right one is still up.
IRWIN Yeah, the right one is still up.
CAPCOM Okay, Jim. Thank you. We will ask you to --
to move that one down before you climb on.
IRWIN Okay.
SCOTT They really stretch -- Hold on the bag
a minute, Jim.
SCOTT The straps are really stretched.
SCOTT Hold on, the bag a minute, Jim. The straps are
really stretched. You need to stand up straight.
IRWIN Man, I am straight. I'm in a crater.
You want to move back?
SCOTT No, I can get it.
SCOTT Okay, take a step forward then.
SCOTT Give me the bag.
SCOTT Give a little to the left, there. No. Okay left.
SCOTT Now okay.
SCOTT Can't see why they put so much Velcro on here.
SCOTT Okay, now if you could bend over, Jim.
SCOTT Take a step. Well, if you can take a little
step forward. Don't fall down in a hole.
IRWIN Try not to.
SCOTT Okay.
SCOTT Get me.
IRWIN Okay.
SCOTT It came open there on your step.
IRWIN Oh no.
SCOTT Jim, your bag is secure.
IRWIN Okay.

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 142:56 CDT 7:30 412/2

IRWIN Pull that flap off there -- (garble).
SCOTT Okay. Get the 70 millimeter camera and the bags and antenna.
SCOTT Don't tape. I'll close LRV battery covers.
CAPCOM Rog, Dave. Thanks.
SCOTT Closed.
SCOTT Hey, Jim. Are you ready to hop on?
IRWIN I will, Dave. Let me just check the (garble) blankets.
SCOTT Okay. I closed them up for you.
IRWIN Okay.
SCOTT (garble) bags on.
IRWIN What are you going to do with those two bags there in front of you?
SCOTT I'm going to put them under the seat.
IRWIN Okay.
SCOTT Don't get rid of bag 2 because it has all your tools in it.
IRWIN Right.
SCOTT Get rid of all my tools.
SCOTT See the solar wind there, Joe. It looks like it's blowing.
CAPCOM Rog. I'm sure it must be, Dave. A little bit, at least.
IRWIN - buckle myself before you get in.
SCOTT Jim, you don't have to put your seat belt on now. We're just going to drive over to the NAV initialization.
IRWIN You're not going to get off there, are you?
SCOTT No. But you can put it on there. So why don't you hop on.
IRWIN Let's go over and get the NAV started.
SCOTT Okay.
CAPCOM And we copied that those batt covers are closed, so press on.
SCOTT Okay.
IRWIN In fact, let me walk, Joe. I'd like to walk a little bit.
SCOTT Not going to go too far?
IRWIN Nope. Don't run off and leave me.
SCOTT Never happen.
CAPCOM Okay, Dave. Once again, we want you to exercise the forward steering procedure here.
SCOTT Okay. Do you want to try it first just the way it was and then we'll try the circuit breaker, right?
CAPCOM Roger.
CAPCOM The forward steering switch should be at buss CHARLIE and the forward steering circuit breaker should be finally closed and then attempt forward steering.
SCOTT You know what I bet you did last night, Joe? You let some of those Marshall guys come up here

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 142:56 CDT 7:30 412/3

SCOTT and fix it, didn't you?
CAPCOM They've been working. That's for sure.
IRWIN It works, Dave?
SCOTT Yes, sir.
SCOTT It's working, my friend.
IRWIN Beautiful.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET14304 CDT0738 413/1

IRWIN You know what I bet you did last night
Joe. You let some of those Marshall guys come up here and
fix it didn't you.

CAPCOM They've been working that's for sure.

IRWIN It works Dave, yes sir. It's working my friend.

SCOTT Beautiful.

CAPCOM Lot of smiles on that one Dave. We might
as well use it today.

SCOTT Well, Boeing has a secret booster
some where to take care of their rover. Oh that's so much better.
See if I can find a level spot around here. Okay Houston, I'm
at the Nav site and I'll reset here and I'll give you the
readings.

CAPCOM Roger, Dave. Standing by.

SCOTT Okay, as a matter of fact I'll make sure
we're balanced I'll hop off. Okay roll is 1 to the left pitch is
about 1 down and bearing distance and range have recycled to zero and
a heading on there now is 305 and the sun shadow device is about
oh a half to 1 to the right.

CAPCOM Roger Dave, and when you are ready you can
start torquing towards 285 and we'll modify that in a minute.

SCOTT Okay. Want to hop on, Jim, and see
if you can get it.

IRWIN (garble) cameras all adjusted. It won't
be 12 frames per second.

CAPCOM Jim while you are climbing on there, we're
going to want you to start out towards course 160 for a distance
of 1.9 clicks towards check point number 1.

IRWIN Just a minute, Joe, I didn't -

SCOTT You got to get up Jim. You are leaning to
far back. (garble) Grab your hand low, that a boy. Okay now
you can set down you're in good shape.

IRWIN Yes, if I can just get down.

SCOTT You are hanging up on something. Watch your hand
controller.

IRWIN Yeah.

SCOTT Oh your wait, wait, wait, wait, wait,
wait, wait. You got to sort of bias it to the right.

CAPCOM And Dave your torquing angle exactly 283,
over.

SCOTT Okay 283 Joe. Did you get your seat
belt Jim.

IRWIN I'm trying right now.

SCOTT It's up and over the pocket, let me hand it to
you here. There now bet you can get it.

IRWIN (garble) Let me -

CAPCOM Rover, did you did you copy 283 heading
and we're standing by for total Nav readouts before you depart
the station.

APOLLO 15 MISSION COMMENTARY 8/1/71 GET14304 CDT0738 413/2

IRWIN Okay, Joe. We'll park it at 283.
Reading about 284 now. Bearing distance and range of course are zero
amps are 100 108 68 78 and motor temps forward and rear are
off scale low.

CAPCOM Roger Jim, copy and the motor temps are
normal.

IRWIN Okay, you going to torque to 283 Dave.

SCOTT And just hold on. That darn camera plug again
down there.

IRWIN You want me to hold it for you.

SCOTT No. You have to get off and unhook this
thing every time.

IRWIN It's bad because every time you bend
over like that you put a strain on that EVA antenna, PLSS
antenna.

SCOTT Do I really?

IRWIN Yea, it bumps against this -

SCOTT (garble) Okay. Here we go. Okay
my seat belts on is your seat belt on?

IRWIN Yes sir.

SCOTT Okay. Here we go.

IRWIN You got to torque that 283.

SCOTT Stand by on 283. Okay, it's 283.

Okay.

IRWIN Okay we're off Joe, we're moving.

SCOTT What's the heading partner.

IRWIN Give us the heading again.

CAPCOM Roger and we're marking. We want you
to proceed towards check point number 1. Your general heading
is 160 at 1.9 clicks and this may take you down between Salyut
and Index creators.

SCOTT Okay. Okay 160. I'd like to go down
there and see those just for a thrill.

CAPCOM Roger Dave. No one should come to Haldey
Rille without seeing Index creator, and we'll try to keep you
posted on when your coming up on that.

SCOTT Okay, fine.

IRWIN Joe, I'm going to start the camera here
will you keep track of it on about 12 frames per second.

IRWIN Roger Jim. We're marking it now. Thank
you.

SCOTT Why don't you hold off for awhile Jim.

IRWIN Okay.

IRWIN Never mind.

CAPCOM Roger.

SCOTT Let me get squared away here.

IRWIN Okay.

SCOTT Hey Joe, the steering is a new task Joe.
It's really responding now. I guess I got pretty used to quiet
steering, and this thing really turns.

CAPCOM Roger Dave. We don't want it to be to easy for you.

SCOTT We can always disengage the rear, rear steering. I can get use to it, it's just a matter of getting use to it.

IRWIN Okay, on our left now, we have a very large subdued creater. I'd estimate 4 or 5 hundred meters across. It has a creater of about 25 meters on it's eastern inner wall about half way to the bottom. And on that smaller crater there's some rock exposed. Looks like some bed rock exposed, in that particular crater.

SCOTT Jim, hold it here.

IRWIN Do I disingage rear steering maybe?

SCOTT Yeah.

IRWIN Okay we're stopping Joe.

SCOTT Just a minute.

CAPCOM Okay Jim. Stopping.

SCOTT Okay, let's try it that way.

IRWIN Okay, we're moving again.

CAPCOM Roger. And you discription is remarkable, remarkably simular to Index. Perhaps your looking at Index crater.

IRWIN I guess it's the largest crater that I've seen Joe.

CAPCOM Rog, we'll reserve judgement on that, but keep describing please. Sounds great.

IRWIN Okay, we're heading 155 and at 1 o'clock position there is a, the a doublet. Gee, I think it's the doublet we drove across yesterday. I'll tell you in a moment when we see our tracks. Do you want to talk Dave.

SCOTT I just want to tell them, I turned off the rear steering to see how she works with the front and it's really a lot better. The double (garble) is a little too responsive when you have the lack of traction, especially on the slopes.

CAPCOM Roger Dave. Copy that. Why don't we save the double (garble) for the rougher terrain later on.

SCOTT Yea, I think that's a good idea.

IRWIN Okay, Joe. That's - it's really a triplet arrangement here that we just passed on our right. I did not see our tracks.

CAPCOM Roger.

IRWIN We're definately east of our track from yesterday.

CAPCOM Roger, we agree.

IRWIN We're heading 170.

CAPCOM Okay Jim, and you may very well be coming up on Arbeit creater.

SCOTT I think we are.

IRWIN I think so Joe.

SCOTT Yea.

APOLLO 15 MISSION COMMENTARY 8/1/71 GET14304 CDT0738 413/4

IRWIN I think so there's a fairly fresh one here with an angular blocks on the rim.

CAPCOM roger, give us the size on the largest please.

IRWIN (garble)

SCOTT (garble)

IRWIN Yes, the largest ones I would estimate 2 or 3 feet angular. There's one on the southeast rim that has a flat top. That looks like a rectangular block. But there are several fragments down there that have the pahoehoe texture that Dave mentioned yesterday. However subtle.

SCOTT Yes.

IRWIN How ever subtle.

CAPCOM Roger, copy.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/1/71 GET14316 CDT750 414/1

CAPCOM Roger, copy.
SCOTT Okay, range is .6. We're heading 160 and we're due in about 8 to 9 clicks.
CAPCOM Okay, Dave, sounds good. Standing by for amps.
SCOTT Okay, amp reading is -
IRWIN Let me get my hand down there Dave. Hand down there -
SCOTT Okay, go ahead. Very good.
IRWIN Okay the reading of the MAX looks like about 10 amps.
CAPCOM Roger, good enough.
IRWIN PNG on 2. Okay, coming up on our right is a very subdued crater again. No gloss at all on its rim, and it is about 50 meters in diameter.
SCOTT Okay let me stop and get the rear steering going.
IRWIN Okay we stopped Joe.
CAPCOM Roger.
IRWIN Now we're going again Joe.
CAPCOM Okay.
IRWIN And I see a very large crater over at 1 o'clock.
SCOTT Okay, let me just get the steering squared away here, Jim.
IRWIN Yeah, okay we've stopped.
CAPCOM Roger, Jim, and that might very well be earthlight at 1 o'clock. And Domingo Crater should be on your left now.
IRWIN Okay, we'll give you a little more report when we get a little closer to it.
CAPCOM Roger.
IRWIN I'm going to hold off too many comments here until Dave gets the steering squared away.
CAPCOM Roger.
SCOTT It feels like the rear steering, when I turn it off, doesn't center, feels like my rear wheels are drifting. So I guess I better turn it back on.
CAPCOM Dave we agree maybe you should turn it back on.
SCOTT Slow. Yeah, I guess you might think about why they don't center for us.
CAPCOM Roger, that sounds like the rover moves like Jim's sandcrabs move.
IRWIN Yeah, that's just exactly what it feels like too. Dave, if you could swing to the right here we could go by the rim of earthlight, what Joe is calling earthlight.
SCOTT Good. Let's do that. Well, there's a big thing here in front of us too.
IRWIN Yeah, but we could - can you get around to the right? Maybe not.
SCOTT Let's go to the left. We're not going to stop at earthlight. Let's go left.
IRWIN Okay.

APOLLO 15 MISSION COMMENTARY, 8/1/71 GET14316 CDT750 414/2

SCOTT Because this is a big excursion there.
IRWIN Okay, now we're going downslope.
SCOTT Yeah, we're going in and out of the craters.
IRWIN I get the impression after I left that there
is a shallow depression there.
SCOTT Gee, over to the left there is a big hole.
Huh, see it over there.
IRWIN Yeah.
SCOTT A big subtle crater.
SCOTT Up, and we're coming up on a sharp one.
IRWIN You got those two ahead of us there.
SCOTT Yeah.
SCOTT Okay, if we can find a reasonable path through
here.
IRWIN Okay, we're heading 140 we're out to 1.0.
CAPCOM Roger, Jim, copy.
IRWIN Doing 9 clicks.
CAPCOM Beautiful.
SCOTT I think we're going by a very large one here,
we're at the 9:30, 9 o'clock, Jim, huh?
IRWIN Yeah.
SCOTT What do you suppose that is?
IRWIN It could be Domingo.
SCOTT No, it's too big.
IRWIN Too big for Domingo?
SCOTT Couple of hundred meters.
IRWIN Let's see 1 out - let's see check point 1 is
GARBLE 1.7.
CAPCOM Dave and Jim that could be possibly Index Crater,
if you started from where we thought. The distance is right
on that and continue on towards checkpoint one.
IRWIN Okay, I would say that probably was Index. It
was about that size.
IRWIN Okay, you've got the right bearing.
SCOTT Yeah. That's nice, huh?
IRWIN Yeah. We're going for 1.7.
SCOTT Going for, yeah, okay, we're 1.2 now.
IRWIN Yeah.
SCOTT A nice deep on there that is smooth and
rounded, about 30 meters across.
IRWIN On one of these trips we ought to stop at one
of these very fresh ones. Really to tap one.
SCOTT On the way back we'll do that.
IRWIN Yeah.
IRWIN I mean one of these small ones, you know, just
filled with GARBLE
SCOTT Oh yeah.
IRWIN Debris and glass in the middle.
IRWIN Yeah. Let's do a systematic sampling on them.
Yeah, like this one over here at 1 o'clock.
SCOTT Yeah, I know what you mean. Okay, bearing is
now 39 and our range is 1.3. Look out ooh. Ow, whoa baby.
SCOTT Okay, all right. yep.

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IRWIN Great machine.
SCOTT Yep, those are good.
CAPCOM Okay, Rover checkpoint 1 is 160 at 1.9 clicks and there is no need to stop there. We can press on towards checkpoint 2, if you are satisfied.
IRWIN Rog, I guess we're okay, Joe.
IRWIN Okay, we've got the right bearing.
IRWIN We're at 1.4 now Joe.
CAPCOM Okay, Jim and we're enjoying your description.
SCOTT Why don't you just give a running comment I'll keep my eyes on the road.
CAPCOM Sounds like a good idea.
IRWIN A crater on our right now about 50 meters in diameter with a lot of gray fragments on its rim. We're just passing one that is sitting right on the surface, about 2 feet subangular. I can look out now and see the south cluster and in the - I get the impression of perhaps, some horizontal bed in the first mound in the south cluster. I do see a lot of blocks over in that direction, particularly on the second mound. The west side of the second mound that appears to be in the secondary cluster.
CAPCOM Roger, Jim. Copy.
IRWIN We're in probably over the area of Crescent - okay, we're 1.7 and again we have a very fresh crater on our left of several blocks.
SCOTT The blocks about a meter or so and the crater is probably about 15 meters like it might have excavated or been a secondary, huh.
IRWIN Notice all the debris here, that the surface is covered with more debris in that particular area than what we've seen before.
SCOTT It sure is.
IRWIN Just around that particular crater.
SCOTT Yep, more being probably 2 percent. It's noticeably more.
CAPCOM Roger. We copy that and Jim, you may want to start your camera if you think this is a good area and don't hesitate to fire off shots from the hip with your 70 millimeter.
IRWIN Okay, I'm going to start the -
SCOTT Point it down, Jim, it's pointed up a little too much.
IRWIN Okay. About like that?
SCOTT Yeah, that's dandy.
IRWIN Okay, I'm starting my camera, Joe.
CAPCOM Roger, we got the mark and we'll watch it.
IRWIN Track it.
SCOTT Okay.
SCOTT Reckon we can get between those two there?
SCOTT It's a bridge between two about 20 meters in diameter, a little doublet and the one on the left has got a bunch of debris and the one on the right has got nothing, huh.

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SCOTT Or very little.
IRWIN There was a very large crater over on our
1 to 2 o'clock position.
SCOTT Oh, yeah.
IRWIN That's the largest one - oh, I guess
it would be equal maybe larger than - well larger than Elbow,
certainly.
SCOTT Yeah, it looks like it. You can't see too
much of it but it does -
IRWIN I don't see that on the map.
CAPCOM Dave and Jim we think you might be looking
at Earthlight now. It might be - it's long dimension is
greater than the east-west dimension.
IRWIN Okay, well that is certainly true. Certainly
true. Okay, we would be - you would have us east of Earth-
light.
SCOTT Hey, here's a big deep one here.
CAPCOM That's exactly correct and Arthur Clark would
be proud of you.
SCOTT 50 meters.
IRWIN Okay.

END OF TAPE

IRWIN might have excavated or -
SCOTT That was east of Earthlight.
IRWIN Houston, Here's a big deep one here.
CAPCOM That's exactly correct. And Arthur Clark
would be proud of you.
IRWIN 50 meters -
IRWIN Okay, and on the south - I can just barely see
the west slope - western slope of Earthlight. But the southern
slope of it, I can also see, has several blocks on it.
SCOTT Hey Jim. Check the camera. I don't think it's
running. I don't see any change in the -
IRWIN Not changing.
SCOTT The quantity indicator. Why don't you feel
it.
IRWIN I did.
SCOTT The film is apparently not running through.
IRWIN Dave, it's stopped now.
SCOTT Yes, why don't you try it again.
Make a little turn here.
IRWIN Okay, it's trying to run, Dave.
SCOTT Okay, point it to forward. Let's see if it will.
I just noticed that the film counter wasn't going.
IRWIN Yeah. I hope we don't have another -
CAPCOM Dave and Jim. The film counter may not have
dropped off the hardstop yet. It's only been going a couple
minutes. We need a range and bearing if you'll give it to
us, please. And continue on, we'll watch the camera.
IRWIN Okay, bearing is 358 and range is 2.2.
CAPCOM Roger, and let the camera run.
IRWIN Yeah, isn't that what I said? What did I
say?
SCOTT You said 358.
IRWIN Okay, 338.
CAPCOM Roger, copy. 338.
IRWIN get around this blocking area here.
IRWIN Looks like we're coming down and have to
go through a small valley.
SCOTT Yeah, sure does.
IRWIN That valley off to the left.
SCOTT Oh, yes. And that's a north south trending isn't it?
IRWIN I hope we can get through this way.
IRWIN Oh, the old Rover will make it. Cute little
excursion.
SCOTT Looks like - it looks more like a valley,
you know that runs east - west.
IRWIN Yes, sure does.
SCOTT Look at that big hole there, Jim. Are we
up on Dune - yeah there's a rampart over there.
IRWIN I was wondering whether we were - could possibly be
on Dune.

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SCOTT Would it be Dune or a Crescent.
CAPCOM Dave, I think you're probably looking into
Crescent.
SCOTT Yeah, think it is.
IRWIN Yeah, I guess you're right, Joe.
SCOTT This little one just to the right of us here,
I see it on the map.
IRWIN Yes, that's Crescent.
SCOTT Yes, I guess you're right. That's a big
fella isn't it?
IRWIN That dune should be dead ahead, Dave, so we'll
probably have to steer a little to the right to go around the
western side of Dune.
SCOTT Okay.
CAPCOM Exactly correct, Jim. You're thinking cor-
responds to ours. And you'll be wanting to head more towards
the south towards the numbers 334 and 3.3 clicks. Jim, disregard,
that's a bad number. You're heading towards checkpoint 2.
IRWIN Okay, yeah checkpoint 2. Okay.
SCOTT Hey, we're in a debris field now, Joe, with
fragments on the order of 6 inches to a foot in general and
maybe - oh, I'd say almost 5-8 percent coverage. Wouldn't
you Jim?
IRWIN Yeah.
SCOTT And there are some that are up to a couple
of feet that require some maneuvering.
CAPCOM Roger.
SCOTT Think I'll go left around this one, Jim,
and then swing over to the right.
IRWIN Okay, yeah, that'll be good.
SCOTT Lots of - the smaller ones are deeper here.
Man, there's one and that's got direction to it - about 4
meters across and a big block in it on one side - on the
south side.
CAPCOM Roger. Just like secondary impact from the
north.
SCOTT That's just exactly what it looks like, Joe.
IRWIN Okay, range is 2.7.
SCOTT Okay.
IRWIN Should be Dune straight ahead.
SCOTT Yes, which way do we want to go around?
IRWIN To the right.
SCOTT Right, okay. Looks like the better way to
go from here. Up a little hill here, about 5 - oh I'd say
it must be a 5, 7 percent grade. The Rovers going right
up like it knows what it's doing.
IRWIN A little more to the right, Dave.
SCOTT Okay, coming right. I've got to get up
on the rim here, where I can take a look.
CAPCOM Okay, Jim and turn off the 16 millimeter
camera, please. The film should be run through.

IRWIN Okay.
SCOTT Not a single motion on the little ball on the indicator, Joe.
CAPCOM Okay, Dave. We copy that. We'll worry about it later.
SCOTT We tried running that through with our fingers last night and guess it didn't do much good.
CAPCOM We'll get the next one, don't worry.
SCOTT Let's see -
IRWIN We can definitely look down into - definitely look down into Dune Crater.
SCOTT Can we ever.
IRWIN Man, it sure likes a ray of blocks that run north and south on the southern slope of the crater.
SCOTT Yes, and there's no big rampart like we were thinking we'd see. Man, look at some of those big ones Jim, they're like 3 meters across.
IRWIN Okay, we're heading now - 250 to get over on the west side of Dune.
CAPCOM Roger, copy.
CAPCOM And Jim, checkpoint 2 is out at 4.3 clicks, bearing 348.
IRWIN Okay, 348 at 4.3.
CAPCOM That's affirm. And nothing magic about that number as you know.
IRWIN Understand.
IRWIN When we get clear of the west side here, Dave, we could just head about 180.
SCOTT Okay.
IRWIN 170 for the front.
SCOTT Lots of debris here, woahhee.
IRWIN Up again to about 5 to 7 percent. Very rough textured, some angular blocks - grey, partially buried - some of them and some of them are on the top huh?
CAPCOM Roger, and Jim, give us range and bearing, please.
IRWIN Up at Hadley Delta.
IRWIN Okay, bearing is 348 and range is 3.0.
CAPCOM Roger, thank you.
IRWIN Look at that Hadley Delta, Dave. Don't you get the impression that those craters secondary to the side there, are oriented, going right up the slope?
SCOTT Oh yes, you called them right, I think - secondaries. I think they just splattered right up the slope. Cause they're the only craters on the side of the mountain.
IRWIN Yes.
SCOTT And they're lined up so nicely.
IRWIN Good sized one ahead, Dave.
SCOTT Yes sir. Avoid that fella stuck in there.
IRWIN Hey, we're going south.
CAPCOM Okay, Jim and please continue.
IRWIN Okay, we're on the - about the southwest side now of Dune Crater. As Dave mentioned, we're heading 155 now. A very fresh crater at our 1 o'clock position with a lot of angular blocks - very

END OF TAPE

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IRWIN A very fresh crater at our 1:00 position. But a lot of angular blocks, very slight raised rim about 2 feet above the general surface, but a very fresh crater. It seems like the Albedo was lighter on that one than others that we've seen. In fact, you ought to see that on your map, Joe. The lighter albedo in the southwest side of Dune. It's -

CAPCOM Roger, Jim. We have it, thank you.

SCOTT And what is the bearing and range to the next checkpoint, Joe?

IRWIN It was 348 at 43.

CAPCOM That's affirmed, Jim. And you'll want to head - continue heading south.

IRWIN Yes.

SCOTT Okay, that bearing now is 348 at 33.

IRWIN (garble)

CAPCOM Roger.

IRWIN If we could line up with that chain of secondaries - -

SCOTT Yeah, that's right.

IRWIN - - going up the side of Hadley Delta. And I look up the slope there at (garble)

SCOTT Yeah, I'll drive off the road there for a moment. As a matter of fact, I'm going to stop right here and take a little break.

IRWIN Okay.

IRWIN Look at 12:30. See that large block sitting up about - I guess it's a - a quarter of the way up Hadley Delta. One of the few - well, probably the only large block on this side of Hadley Delta.

SCOTT Yeah. Say, by the way, we're stopped now, Joe.

CAPCOM Roger Dave, we copy.

SCOTT Yeah, I just wanted to take a little break for a minute. Jim, why don't you pull your camera up and swing it around and get a pan. Let me hold the maps for you.

SCOTT I'll bet you can get, you know, almost

SCOTT one hundred degrees of pan there.

SCOTT And, Joe, I just put my diverter to mend and I never tried it on the rover before, but the controls are very easy to reach.

CAPCOM Roger, Dave, interesting.

IRWIN Okay, we got about a 90-degree there, Dave.

SCOTT That's very good. Okay, put your camera back on and I'll give you your maps back.

IRWIN Okay.

SCOTT Done?

IRWIN Yeah.

SCOTT Okay, ready to go?

IRWIN Yeah.

SCOTT Okay. A drink of water and a little bite of fruit stick; we'll be on our way.

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IRWIN Okay, we are moving by the way.
CAPCOM Copy.
IRWIN I think one of those - one of those craters
there dead ahead Dave is probably be Spur, up on the side.
SCOTT Yeah. Yeah. I think you're right.
IRWIN Probably the large one at 12 o'clock.
CAPCOM Okay, Dave and Jim, thinking downstream
a little bit, we want to drive past checkpoint 2 and continue
on towards checkpoint 3 and this is our reconnoiter run
along the bootherage of the front.
SCOTT Okay, understand, Joe.
CAPCOM We're looking in particular for fresh craters,
lots of frags, good sampling drill holes into the Front, and
Mare.
SCOTT Roger.
SCOTT And a sweep, and the high water line and
all those good things.
SCOTT Incidentally, Joe, thinking back on something
we saw yesterday down towards Mount Hadley, we saw a three sort
of suggestion of beddings or horizontal linear lines at the
base of Mount Hadley, and I got to thinking last night, maybe
that was the high water mark for the basin at one time, because
there are only three of them down there and they were unique
at the base of that Mountain.
CAPCOM It might just be.
SCOTT I think we're arriving at the Front here
pretty soon. And the debris has sort of diminished quite a
bit. Sort of like we're out of the secondaries.
CAPCOM Dave or Jim, could you give us an estimate
of the numbers of rock types you're looking at. Have you seen
two populations so far?
IRWIN Oh, it looks like brush as far as I can tell,
Joe, just driving along.
SCOTT Yeah, I sort of agree, Joe. We - it's
really - the sun is about 45 degrees to us right now and
it's sort of tough to see any differences in the rock types.
They all look relatively the same.
CAPCOM Roger. We copy. And press on troops with
the description. It's beautiful.
IRWIN Okay, we're moving to 10 clicks, we're at
347 on bearing and 3.9 on the range.
CAPCOM Okay.
IRWIN I'd say the terrain is good for driving,
isn't it Dave?
SCOTT Yeah, it's a lot better here.
IRWIN Make better time here along the Front.
SCOTT Yes sir. In fact I bet you we just went
by - You know we just changed terrain type almost distinctly
there, Jim.
IRWIN Yeah.
SCOTT You know we don't have the deep craters
anymore. The deepest around here may be half a meter or so

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SCOTT and we don't have the rocks, the debris on the surface, just a few. As a matter of fact, right here at 347 range 4.0, it's pretty smooth.

IRWIN There's a crater.

SCOTT A settled depression; no debris.
We can navigate that one alright.

IRWIN Some fairly good blocks and not - by themselves there.

SCOTT Yeah. 11:30.

IRWIN But I guess our primary objective is the Crater.

SCOTT Yeah. We'll hit that first.

SCOTT Boy that's a big mountain when you're down here looking up, isn't it?

SCOTT My o my!

SCOTT This is as big a mountain as I ever looked up.

CAPCOM Dave, do you see Spur as you look up there?

SCOTT See the craters in that one directly ahead.

IRWIN Oh yeah, I see what you mean, Dave.

SCOTT See that?

IRWIN Yeah, there are - let's see 1 - 2 - 3 - 4, at least 4 lined up going upslope.

SCOTT Yeah, right in the wall of the crater.

IRWIN Yeah.

SCOTT Just perfectly linear and perfectly uniform craters; little ones; maybe - -

IRWIN Yeah, but look there's a - a rock in below those. I wonder if it could have bounced out (laughing) of all of those.

SCOTT (laughing) It could (garble) that many.

SCOTT Yeah, we're going - at the base of the Front, we're going down into a little depression that runs along the Front. We came over another north/south trending ridge, and we're going down a little bit and then we're going to start up again.

IRWIN Yeah, so we can see what happens to the rover speed here as we start upslope.

SCOTT Yeah, because we're starting upslope.

IRWIN I'd estimate 3 to 5 degrees.

SCOTT Yep. Okay, going to take a little lean to the left here. Boy that - those weren't very big holes at all were they? I guess the shadow made them look

CAPCOM Dave and Jim, what was the bearing on that chain of craters you described?

SCOTT Let's see Joe. Joe it was just a very settled little - maybe half foot craters of the size of a 4-meter crater. Uh, the - -

END OF TAPE

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SCOTT To the size of a 4 meter crater that showed up very well in the shadow.

CAPCOM Okay.

SCOTT That was just in our 348 for 4.3 where we are right now.

SCOTT And we stopped and let's take a gander around and see which way we ought to head.

IRWIN Do you know, Dave, if we can make out that far directly ahead of us - Look at the large blocks.

IRWIN Come down slope.

IRWIN Yeah. At 12 o' clock.

SCOTT The antenna is in my way.

IRWIN Okay, that's as good a way as any.

SCOTT We'll head 140 from here.

CAPCOM That sounds good and can you see Spur as you look up the slope?

SCOTT Yes, sir. Dead ahead. It's very visible and right up on the side, about 5 percent of the slope of Hadley, DELTA, is a very large block on the surface all by itself, very large and gee, it must be 5 meters, huh, Jim?

IRWIN The one at 12 o' clock?

SCOTT Yes.

IRWIN Oh, I bet you that's -- I'd say 5 times that size cause that's another 3 kilometers down there.

SCOTT All right. I'd buy anything. It sure looks big.

IRWIN Yeah.

SCOTT I was trying to be conservative.

CAPCOM And, rover, we're standing by for your mark when you roll.

SCOTT (garble).

SCOTT Oh, I'm sorry, Joe. We rolled about a minute ago.

CAPCOM No problem.

SCOTT A 347 from 4.4. A little depression here, Jim.

SCOTT I get the feeling - we're leading left.

IRWIN When we stop, you want to take a look to the left there. You can see all the slope raises abruptly up to there to Hadley Delta.

SCOTT You're right.

IRWIN Like we're driving in a valley.

CAPCOM Dave and Jim. What would you think of the suggestion of going to Spur directly from your present position and use that as your first station?

SCOTT Yeah, I think that might be a good idea, Joe. Let us get out and do a little geology and take a look around. I think -- Jim, would the Spur would right about 12:30 to us?

IRWIN Yeah.
SCOTT Do you have some coordinates for Spur, Joe?
SCOTT Cause there's a large block --
IRWIN Yeah.
SCOTT On the slope on the front that we can sample.
The Spur should be in that vicinity.
SCOTT We're doing 8 clicks.
CAPCOM Okay, Dave and Jim. Spur is at bearing 346
range 4.6.
SCOTT Oh. We're at Spur then.
SCOTT We're at Spur.
IRWIN But I don't see it.
CAPCOM Okay, by that, really, we just mean an
equivalent crater. I guess continue your reconecter along
the front. Sounds good.
SCOTT Okay. I don't know how high we want to go
on the front.
IRWIN I don't either. But we don't want to go
too high, I don't think. We're --
SCOTT Hey, that must be maybe to the right there,
Spur, huh, Jim?
IRWIN Okay, I'll buy that. Yeah.
SCOTT Yeah, That's Spur.
IRWIN Yeah.
SCOTT Okay, let's head over to this ridge at
11 o' clock. We don't -- I think that's Spur right over there.
IRWIN You don't want to hit Spur now?
SCOTT No, let's go on down to this rise right
in front of us.
IRWIN Okay.
SCOTT Okay, we know where Spur is. We're passing
it - we're - it's at our 3 o' clock position and we're bearing
346 4.7, Joe.
CAPCOM Roger.
SCOTT And we're moving along the front now.
CAPCOM Roger.
SCOTT Do you think --
SCOTT I think we can do a little contour
travel here, Jim? And on the way back pick up that big
block up there.
IRWIN Okay. In other words, I see what you mean --
to angle uphill.
SCOTT Yeah, angle uphill here.
IRWIN That'll be better. We probably -- Boy
it's right into the Sun, isn't it?
SCOTT Hey, you want a map to hold over your eyes?
IRWIN No, that's okay.
IRWIN As we drive up sun here, I'm looking to the
left and I can see the Mount Hadley and the linear patterns

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IRWIN in it are really remarkable. Dipping to the northwest. And the pattern runs from the very top of a whole mountain has the same pattern -- linear pattern.

CAPCOM Roger, Jim.

IRWIN And -- It has the same direction as the dipping beds I mentioned yesterday that intersected the horizontal beds are water -- have water marks that Dave just talked about. We looked at the Spur on High Hadley.

CAPCOM Okay.

SCOTT Okay, see this little crater on the ridge line here at one o' clock? I think that's where I'll head, Jim. We'll call that something or other.

IRWIN You know, I can see an -- an inflection point here as we go upslope.

IRWIN Another inflection point.

SCOTT Just above us here.

IRWIN Yeah.

SCOTT Yeah.

IRWIN How far east do we want to go?

SCOTT I think this ought to do it.

CAPCOM Dave and Jim. The first thing we need is just a good sampling stop, to get a general look around and we want a crater like spur or anything similar but one that's provided a lot frags for us and perhaps a lot of rock types to sample.

SCOTT We haven't seen any besides the Spur just yet.

IRWIN There aren't any like that, Joe. Just aren't any.

SCOTT They are all very subtle up here.

CAPCOM Okay, Dave. I guess we want to continue on towards the east and keep your eyes open.

SCOTT Yeah. We're up on a little ridge here. And I think it would do well for us to stop here and sample the rocks we can see in this area and then head over to that boulder, there. See how we do, okay?

IRWIN Okay.

SCOTT What do you think about that, Joe?

CAPCOM Okay, Dave. That sounds good. However, we're interested now in typical rock types and hopefully, an area that's going to have a lot of fragments around it, not necessarily just one boulder.

SCOTT Yeah, we have a number of fragments in our local area none having really been excavated from a particular crater. There is no crater up here which is excavated a lot of debris. They're all very subtle and old but there are rocks on the surface. So, I think our best shot here is to hop off and gather up a number of these rocks in our vicinity - I'll bet we can get -- oh, 10 12 very easy and then -- think about that.

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CAPCOM Okay. That sounds great. Let's press on.
SCOTT There's one of those --
SCOTT There's one of those very fresh craters over
at 11 o' clock to your right. Several of those around.
IRWIN Okay. Rover power is off and our bearing is --
SCOTT I'll give that.
IRWIN Okay, Joe, here's some readings. 195 343
065 050 92 and 100 7581 and motor temps are both off scale
low.
CAPCOM Roger, copy cool motors --
IRWIN I'd be very careful you don't fall backwards.
SCOTT Thanks, Jim.
CAPCOM Jim?
IRWIN Yeah, hold.
IRWIN Be -- be careful you don't go backwards there.
SCOTT Yeah. We're on a steep slope.
IRWIN Your belt's caught. Just a minute.
IRWIN Just a minute. Okay, hold on there.
SCOTT By golly, Joe, this rover is remarkable. I'm
telling you, we have climbed a steep hill and we didn't even
really realize it. And we were going like 10 clicks up this
hill and we're on a slope of -- it must be at least, oh, 8
degrees or so?
IRWIN 8 to 10 degrees.
SCOTT 8 to 10 degrees. And we can look back and
see the whole -- we can see the LM just loud and clear as can
be.
IRWIN Agreed.
SCOTT Gosh, I'll tell you this rover is really some-
thing.
SCOTT Look at that.
SCOTT Oh, boy. Okay. I'll take a pan. And Joe,
when the TV comes on, you're going to get a super-picture.
CAPCOM Yes, sir. We're standing by.
SCOTT Okay. Going FM TV now.
CAPCOM Okay, Dave. And we may ask you to dust our
TV lens off. We'll ask you to stand by for a reading on that.
CAPCOM And rover, do you read Houston?
SCOTT Yeah, we read you, Joe. What is it? We will
stand by for you. You read us okay?
CAPCOM Yes, sir. You're loud and clear. And we're
standing by for the picture.
SCOTT Yeah. I have to get the antenna alined. It's
going to take a little bit here.
CAPCOM Roger. And just proceed with caution.

END OF TAPE

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CAPCOM Roger, and just proceed with caution.
SCOTT Yea. I don't know why we always end up
on these slopes.
IRWIN You know I want to take a picture up
slope Dave but I can't. I can't get the camera pointed up
that way.
CAPCOM Just do the best you can on that Jim.
No problem.
SCOTT Okay, you must have the picture now.
Or at least the antenna's pointed.
CAPCOM Okay Dave. We've got the data, and
we're working on the picture.
SCOTT Okay, and do you want it dust, okay,
do you want a dust job.
CAPCOM Stand by on the dust job.
SCOTT We're moving now.
SCOTT Okay, we're going to leave the rover
here that's what, that's why I wondered.
CAPCOM Okay fine.
SCOTT Boy what a view, huh?
IRWIN It's something.
SCOTT Boy, spectator..
CAPCOM And do we have a picture down here.
IRWIN Hey, you couldn't, Joe, because the camera's
pointed straight down.
CAPCOM Roger, it's a close up of the rover
wheel, and it's still smoking.
SCOTT Seeing what's here at the front.
IRWIN I'm with you.
SCOTT Okay, let's go up first so we can come
down hill and there's one of those fresh little craters.
IRWIN Yea.
SCOTT Let's go sample that one.
SCOTT Got glass in the bottom.
IRWIN I never thought we'd have a problem like
this, on the moon like we do on field trips trying to maintain
our balance.
SCOTT I never did either.
IRWIN Oh boy. It's a nice little crater isn't
it.
SCOTT It sure is.
IRWIN Okay, I'll get you a bag and it looks to
me like the best thing to do is would be to scoop the sides, scoop
the center where the glass is.
SCOTT Oh what a beautiful sight. You know, we're
a long way from the LM.
IRWIN At least we can see it.
SCOTT Yea, that's encouraging.

IRWIN We never did remark on that very white crater out there northwest of the LM did we?
SCOTT No, I don't think we did. It's really, really white though isn't it. Yea, I've got you a bag and it's number 10

-
IRWIN Did you look at the sample with the glass in the middle of it.
SCOTT Yea, start with the middle and we'll pick up the rim too. 163.
CAPCOM Roger, 163.
IRWIN Here how it's all kind of welded together.
SCOTT Yes.
IRWIN More.
SCOTT Yea, give me another load.
IRWIN I hope it stays together for us.
SCOTT Yea. That's good.
IRWIN Like fragments all glued together. What an intricate pattern.
SCOTT Good. Out standing. Okay. Get you another one.
CAPCOM Okay Dave, and is that still bag number 163?
SCOTT Yea, the next one coming up is 164 and would you to skip the rim there Jim.
IRWIN A little more.
SCOTT Yea, let's get a good bag full.
Okay Joe, it's very fine light gray, the rim is. Very fine. Okay, can you hold this one and I'll Vee the other one.
IRWIN TV coming in good now Joe?
CAPCOM Roger Jim. We've got a beautiful picture. We're trying to look into the sun at the moment, some what unsuccessfully. But the TV's working beautifully.
IRWIN You ought to look up toward, you ought to look up toward Mt. Hadley. You can see that linear pattern.
CAPCOM Rog. we'll take a look and thanks for the recommendation.
SCOTT Okay Jim. Let's find ourselves a couple of frags down here. Here's a, there being within easy range over here.
IRWIN Frags show up pretty good down front don't they.
SCOTT Yea.
IRWIN Okay, let's see. We could go after some little ones but -
SCOTT Right there in front of you Jim. That big one. Get that one.
CAPCOM Okay Jim, and are you still scooping samples?
IRWIN (garble) we're sampling a rock right now.

CAPCOM Roger, and we know you're picking up the representative ones.

IRWIN (garble)

SCOTT Yea.

IRWIN The number on this bag is 188.

CAPCOM Roger Jim. Copy 188 and have you noticed a variety of rock types or just one general kind.

IRWIN Okay, let us go through them Joe as we pick them up because we can't tell any difference as they sit on the surface. They're all covered with dust and the first one here is a fine grained breccia - a micro breccia. And it's got it looks like a third order with white glass in it. The matrix is dark black and it has glass within a fracture on the side. Not unlike some of the 14's.

CAPCOM Roger.

IRWIN I'll put some soil in.

SCOTT Get that other frag right next to it Jim. here let me hold it, I'll get it. Okay, good boy. And Joe the soil is very powdery here.

CAPCOM Roger copy Dave.

IRWIN It looks the same - just a dull here. Okay, same thing. Same kind of fragment, frangible. Okay. You give me the bag and I'll let you take a little scoop right there by the side of those two there. Okay can you get it.

IRWIN I have to get back up hill. I've got most of it I think.

SCOTT That's good. That's fine. Okay 188 to confirm again.

CAPCOM Roger.

SCOTT Okay.

IRWIN Dave there's one up slope with a flat side.

SCOTT Yea.

IRWIN Maybe we could take that back as, take it back as a large one. Do you want to wait till we get over to a fresh crater.

SCOTT Let's wait till we get to a fresh crater.

IRWIN Okay.

SCOTT See if we can get some more, heres one down here to your right.

IRWIN Yea.

SCOTT I see it to. Let's just make a little circle around the old rover here and find some variety.

END OF TAPE

IRWIN Get it?
SCOTT Yeah.
IRWIN Okay, this is fairly large subangular fragment which is about 20 percent buried. I'm not sure we'll get that in the bag.
IRWIN I don't think we will, Dave.
SCOTT Well, we've got it anyway. See what it looks like here.
IRWIN The bottom - looks like a light gray micro breccia with some white clast of millimeter size in it and that's about all and the bottom side is GARBLE size, and I do see some glass spattered on one side. And I also see one little - looks like an orange crystal in there - like it might be a little piece of olivine. It's got definite reddish, orange color to it.
CAPCOM Okay, beautiful.
IRWIN Get the picture before I step in it.
IRWIN Okay. let me see if I can get this in it.
SCOTT Do you want to try putting it in the bag.
IRWIN Yeah.
SCOTT This is definitely a different kind of breccia Joe. It's only got light gray millimeter size clasts in it with a fine grained gray matrix. In the clast there are about, gee, I'd say 10 percent of the total frag. So, it's somewhat different. Here I can hold it with both hands if you can stick it in. Let me hold the bag. Get the bag if you can get the thing in there.
IRWIN Watch my helmet, with your -
SCOTT Okay, I've got GARBLE today. I don't think so either, I've got it.
IRWIN Let go, let go.
SCOTT Okay, that's going in your collection bag as a single and I think you can remember it, Joe, sorry about the bag, just fell, I let it go. It's got flickering sides on it.
CAPCOM Roger Dave.
SCOTT Okay, Jimbo. Keep going around the old boulder here and see if we can find another interesting looking one. As you can see probably with the TV Joe there just isn't much in the way of debris around here. It's all -
CAPCOM Roger, Dave. We agree. Good description and we might - set you out a little later looking for a fresh crater that's gone up from frag 4.
SCOTT Okay, Jim here's one sitting on top of this little crater over here. Reckon you can get over here to it.
IRWIN Yeah, I was trying to recover that bag but I gave up on it.
SCOTT Oh, we've got plenty of bags. Don't sweat the bags, we've got more than we'll ever need.

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CAPCOM And Jim, understand were you able to sweep around the full 360 degrees?

IRWIN Yeah.

CAPCOM Okay.

IRWIN Yeah. I have a pan. I'll dig another one probably before we leave the area so you get a little stereo effect.

CAPCOM Beautiful. We've got film to burn.

SCOTT You can tell we sank in about 2 or 3 inches.

CAPCOM Roger.

SCOTT material. Jim, I would say that this fragment here hit right before its position. You see that little spot. See that little spot right there in front.

IRWIN Yeah.

SCOTT I think that rock hit there.

IRWIN Yeah, you can convince me of that. And it - we'll have to take a look at it - let me get the pictures here.

SCOTT Wonder from whence it came. If it did hit there it was traveling (garble) west.

SCOTT Yeah.

IRWIN East to west and it left a little mark about a foot from its present position and it's present position is on the surface, to about 4 inches, subangular and we'll pick it up and take a look at it. As a matter of fact, I'll see if I can't get a close up of the little spot that it hit here. Well, if I can lean down. Okay.

SCOTT Did you get the down side, Jim?

IRWIN Yeah. Pick it up. Okay. That stuff is really soft.

SCOTT Yeah. Help me to get it with the scoop?

IRWIN At a boy. Come on.

SCOTT I'll throw it up and you catch it. Any luck at all.

IRWIN Way down there. Easy does it. Okay, let me get down here, let me use my tongs, to pick it up.

SCOTT Okay, good. Hey, hold it right there. Up a little more. I got it.

IRWIN Man it's really covered but it's a very rough surface, very sharp, basically a subangular rock but with quite a jagged, craggy surface on it and I can see some spots in there I guess I have to call it a breccia. It'll never fit in there, just let me put it in your bag.

SCOTT Okay.

IRWIN And I think we have it fairly well documented. It's in collection bag number 3 which will help you keep track of it.

CAPCOM Okay, Dave, thank you.

SCOTT Either big ones or little small ones.

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SCOTT Okay, got the picture.
IRWIN Dave there is a crater over to the west, Dave,
that has a very light albedo that's -
SCOTT Yeah, let's head that way with the Rover when we get
going.
IRWIN Okay.
CAPCOM Okay, Dave and Jim, when you reach a good
stopping point we've got a couple of questions.
IRWIN While you are asking I think I'll take another
pan.
CAPCOM Okay, Dave, Jim, it sounds good. And, Dave,
while he is doing that could you tell us how far away and
in what direction is the large block which you described?
SCOTT Yeah, Joe we intend to head in that direction.
It's right now due west. It's probably oh, three tenths of
a kilometer or something, and I think it's on the same slope,
maybe upslope a tad from where we are now but not too much.
And on the way, there is a nice fresh light albedo crater,
maybe a couple of meters across, so maybe we ought to pick
up those two.
CAPCOM Okay, copy. You can see towards the west,
a light albedo fresh crater. As you look back toward - okay
sounds good. We copy that. Thank you.
CAPCOM And Dave, another question do you think this
is a good area for a rake sample?
SCOTT No, Joe. Definatly not.
CAPCOM Okay, copy that.
SCOTT It's GARBLE. There is nothing here.
CAPCOM Roger, we agree.
IRWIN Spinning our wheels. Hey, swing around and
get the downsun, Dave.
SCOTT Here let me get it. I'm in a better position,
Jim.
CAPCOM Dave, do you think that that fresh crater you
were looking at might be Spur Crater? We put your present
position as halfway between Window and Spur.
SCOTT No, I don't think - it's too small, Joe. I
think we picked up Spur as we went back - went by a little
while ago. We saw it.
CAPCOM Okay, we agree with you exactly here, Dave and
Jim.

END OF TAPE

CAPCOM Okay, we agree with you exactly here, Dave and Jim, and we want you, when you leave this station to move back towards the west, in other words, towards the direction of the Rilles and looking especially for fresh craters.

IRWIN Okay, Joe. Okay, another little micro breccia.

CAPCOM Ag number is 190.

IRWIN Okay.

IRWIN Take another look at this other one here.

SCOTT Oh boy, look at the bottom of that Jim.

IRWIN Oh, glassy isn't it?

SCOTT Yes, glass all over the bottom of that one and it looks like another micro breccia. I don't see any pits in any of these, at all - I do see a couple of glass - yeah there this one's got a couple of very small glass filled pits, but most of them are pitless. Okay, 190.

IRWIN Did you put any flow on it?

CAPCOM Roger, 190.

SCOTT Its typical.

SCOTT Okay, Joe. I took the downsun from a different side on this one - I mean the cross sun from a different side on this one if you want to log that. Okay, you want to stick that in my bag?

IRWIN Yes.

SCOTT And let's go down and take a look at this little crater right here. There's a little crater that you can see Joe, at about 2 o'clock to the TV now. And -

IRWIN Have trouble getting up to it.

SCOTT Got it?

IRWIN I just got the bag opened.

SCOTT Oh, really.

IRWIN Up on a mound.

SCOTT Well, let me get down. Okay.

IRWIN Got it.

SCOTT Okay.

SCOTT Okay, let's move down here. Downhill with care. Looks the same - look down at the bottom of that crater - another little crater with a bunch of debris in it.

SCOTT If I could find a spot on the side here -

SCOTT Hey, look at the little bench on this one.

IRWIN Yes, I was going to remark about that on the downslope side.

SCOTT Yes, I took a picture of it.

CAPCOM Jim, it's about time for a stem christy.

IRWIN Need a snowplow.

SCOTT Jim, I suggest we go down to that little bench. We could actually walk in and do a radial sample.

IRWIN Yep.

SCOTT Look at how this zero phase just wipes everything out? Man. We can move this here easy. Cause we don't want to go too far down hill.

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IRWIN Right.
SCOTT Climb back up to our Rover friend.
SCOTT Gee, they're all too big.
IRWIN Notice, you're kicking up some white material
there, Dave?
SCOTT No, I didn't notice. Hey, you're right,
IRWIN You ought to trench it.
SCOTT You're right, you sure should.
CAPCOM Good idea, Jim. Sounds great. A trench
sounds great.
SCOTT Trench sounds great - okey.
IRWIN Trench or a core?
CAPCOM Yes sir, a single core would be nice. They're
always nice.
IRWIN You guys are easy to please today.
SCOTT Why don't we go to the upper rim up there and
pick up the core, Joe - Jim on the way back up?
IRWIN Okay.
SCOTT Let's get this fragment here or a bunch of
these little ones I guess - so much dust - on the camera, it's
hard to read the settings.
IRWIN Okay, I think the big one is too big to put
in as usual. Of course, we'll never be satisfied with that,
but I'll take some of these others.
SCOTT Okay.
SCOTT I think they're the same. Dust off a little
bit. Another breccia.
IRWIN AGS number 192.
SCOTT Hold it and I'll get a bunch of these frags
right here.
CAPCOM Roger.
SCOTT Not much glass.
IRWIN Okay.
SCOTT That ought to do it, why don't you close it
up and I'll put it in right here. Dying to look at that big
rock.
IRWIN Put this in your bag.
SCOTT Okay.
IRWIN Okay.
SCOTT Let me borrow your hammer. I'll take just
wack and see if it will come open. Like to - the visibility -
hold my tongs please.
SCOTT Let's see if we've got a variety here.
CAPCOM Not bad at all.
IRWIN It's valuable - what you're trying to get.
SCOTT It sure is. Not bad for a beginner.
SCOTT Okay, use the tongs and let's just get
another bag and pick up those 2 little frags there - what
do you say?

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SCOTT Evidently your TV is working okay today, Joe. Is that right?

CAPCOM It's beautiful, Dave. Either that or it's another ESP experiment.

SCOTT Okay, a microbreccia with millimeter white clast and there's a little grey clast - - that's about 3 millimeters. That looks a little different. Let me go down and get this other one that came up.

IRWIN And 193 is the number on the bag.

CAPCOM Roger, copy. 193 and we're standing by when you start the trench.

IRWIN Okay.

SCOTT Okay, would you like a trench or a core, Joe. We'll give you your choice today.

CAPCOM We'd like one of each if we could, Dave.

SCOTT A trench and a core?

CAPCOM Yes sir.

SCOTT Okay, we'll go up and trench it first and see if it's worth coring.

CAPCOM Okay.

SCOTT Let's go up on the upper rim up there. And work our way up to our Rover friend.

SCOTT Right up here where it's nice and fresh.

SCOTT Hey, Jimmy. Dig me a little trench when you get up here.

IRWIN Okay.

SCOTT Make it okay?

IRWIN Yes, I'm taking my time.

SCOTT Good idea.

IRWIN Look at those linear features on Hadley, Dave, if you get a chance to look up there

SCOTT I did.

IRWIN To look up there.

SCOTT On Mt Hadley?

IRWIN Yes.

SCOTT Oh, yes, my word - look there dipping to the northwest right?

IRWIN That's right, that's what I said.

SCOTT Oh yeah, it's a big - looks like a big block tilted up on its side.

CAPCOM It's like you called it, Jim and we're going to ask for 500 millimeter pictures of that when you get back to the Rover.

SCOTT Boy, I was just going to say "We'd better take some 500 millimeter pictures of it." Okay, Jim's trenching. Hey, the other side, Jim, I can't see you.

IRWIN That's right.

SCOTT Let me - I'll move around - you take it that way, I'll come around.

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IRWIN No, it's going to be too hard for you to get down in there Dave.

SCOTT Yes.

SCOTT I can trench it here.

SCOTT Just right, right like you got it. Keep digging. You'll have to - that's right - okay. I can see it. That's fine.

Boy, when you put your scoop in and smooth it out flat just like plaster.

IRWIN I was going to say like cement.

SCOTT Yeah.

SCOTT I can't see any layering because the - and the scoop just -

IRWIN It's all very similar in color. Can't tell whether -

SCOTT Nice and cohesive - it holds a straight wall very well. It's very fine.

END OF TAPE

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SCOTT See below a straight wall very well.
Very fine pattern.

IRWIN Just like - Graphite.

SCOTT Okay. Well, why don't we call that a trench?
Wouldn't that be nice if you could do that at station 8.

IRWIN Oh, I hope so.

SCOTT Let me get this - move to your left. And
let me get over here.

SCOTT A little further Jim.

CAPCOM Okay troops and we'll be asking for an
SESC from the bottom of the trench when you get it built.

SCOTT Okay.

SCOTT Oop. How about a hand old buddy.

IRWIN Yep.

SCOTT Just get it firm then give me a hand.

IRWIN Okay, stand by.

IRWIN Okay.

SCOTT Okay. That's it.

IRWIN Thank you.

IRWIN Get the picture?

SCOTT Yeah, yeah. I think so.

SCOTT The rim, as all rims around are very soft.

IRWIN Did you hear him Dave, he wants the SESC
at - at the bottom of that.

SCOTT Okay.

IRWIN Okay, get a bag; I'll sample the bottom.

SCOTT Okay.

SCOTT I'll get you a bag.

IRWIN First scoop.

SCOTT Yeah.

IRWIN Just one.

SCOTT Okay, that's good.

IRWIN Okay, I'll get the SESC - -

SCOTT No, listen. Hey, Joe, listen, we're going
to go over to this fresher crater, we hope. Maybe we ought
to get it there, unless you really need it here. Because
there's the little trip back to the rover.

CAPCOM Dave, that's affirm. You will be moving
over towards the fresher crater, and stand by I'll get another
reading on your core tubes. Copy, you've gotten the SESC
out of the bottom of the trench now.

SCOTT Oh, no, no, no, no. We haven't, Joe, you
missed it. 166 is the bag. (garble)

CAPCOM Okay.

SCOTT you see we just got a sample from the
bottom of the trench, and since we - since we have to walk
on back uphill to the rover to get the SESC - -

IRWIN No, it's on your back.

SCOTT Oh, just do it. I'm sorry. That's right.

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SCOTT Have at it.
CAPCOM And, Jim, if material has fallen into the trench, you might want to scoop it out again.
IRWIN No, I don't think that it has. We're very neat.
SCOTT Why don't you just stand out of the - don't get too far down in that there crater.
IRWIN Yeah.
SCOTT I'd just scoop out the bottom and this side a little bit Jim.
IRWIN From the bottom, you say?
SCOTT Yeah, did it a little bit deeper. I think you can probably get the thing deeper and - -
IRWIN You want me to hit bedrock, I know.
SCOTT Yeah. Okay, I can't see in the bottom of it, but go ahead, Dig her.
IRWIN Have a - have a scoop load.
SCOTT I think the wall collapsed on you.
IRWIN Okay.
IRWIN Yeah.
SCOTT Okay. Get your scoop up. That - that's it. That's it. That's good, Jim. That's about half. Can you get another one? Hey, don't slide down in there. That's really slippery.
IRWIN Yeah, I noticed.
SCOTT Just dig. That'll be good.
SCOTT Okay.
IRWIN Good show. Good show.
SCOTT Good - Yeah, that's good enough.
SCOTT Boy, it's really easy to dig it out.
IRWIN Dump it out isn't it?
SCOTT Why don't you work yourself out of that crater to your left. If you try to come up like I did, you're (garble).
IRWIN Let's see. We probably out to put that SESC in your bag.
SCOTT Yeah.
CAPCOM Good thinking, Jim.
SCOTT Here. Give me the easy end. Good.
CAPCOM And, Jim, did you get an after picture of that?
IRWIN Hey, that right. I've got to get it.
SCOTT I'll - I'll get it, Joe.
CAPCOM Okay, Davey.
IRWIN Okay. It's in.
SCOTT Okay.
IRWIN I'll take that scoop.
SCOTT Okay.
SCOTT Now, if you'll move out of the way, I'll see if I can get in there and take the picture.
CAPCOM And, Dave, while you're taking that picture,

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CAPCOM we'll be asking for a core tube after that. We want you to use an upper core, because we only have one lower in the bag right now.

SCOTT Very well, Joe, we'll get you a core right here.

CAPCOM Rog. The core using the number.

IRWIN one, four, upper core.

SCOTT Okay.

IRWIN You know, it's unfortunate, Dave, that we didn't take that down at the lower rim where the white was exposed. Here I don't see the white.

SCOTT Yeah, I didn't either. Maybe we ought to go back down there and do that.

IRWIN Seems like we would save the core for somewhere where there was definite layering.

SCOTT Yeah, I think so too. I don't think there's - - yeah.

CAPCOM Jim, we've got that double left and you suppose you could drive a single core down where it's white?

IRWIN Yeah, sure I could.

SCOTT Let's go do that. Yeah, let's go take advantage of what we know down there on the albedo.

SCOTT Go ahead. Go ahead.

IRWIN Yeah. I'm right behind you.

SCOTT By the fresh rock down there.

SCOTT Yeah, you can sure see the change.

SCOTT But up on the high place here.

IRWIN On the bench. Let's try it right there.

SCOTT Yeah. Boy. The soil's more granular here, too. Quite a difference from one side of the rim to the other.

IRWIN Yeah.

SCOTT Okay.

IRWIN I'm probably just about out of film. Why don't you check with my mag.

SCOTT Okay.

SCOTT Yeah. 180.

IRWIN Okay. Okay, Joe, are you suggesting using an upper here.

CAPCOM That's affirm, Jim, an upper.

IRWIN Okay. Okay, I have it Dave.

SCOTT Okay.

SCOTT I don't think you'll need your hammer, but I'll get it and bring it.

IRWIN Yeah, and I'll get up on the uphill side here.

SCOTT That's a good idea.

IRWIN Okay, it's in position.

SCOTT Okay, I got the picture. 07 is the number Joe.

IRWIN Push in.

CAPCOM Roger.

APOLLO 15 MISSION COMMENTARY, 8/1/71, 9:00cdt, 144:26get, 421/4

SCOTT Oh! Easy. Easy.
SCOTT Okay, all the way in very easily with a
push, Joe.
CAPCOM Okay.
IRWIN Be very - I wonder.
SCOTT Yeah, it'll be soft. Bring it out. Be
gentle. Don't auger it; spill it.
SCOTT Have you got it?
IRWIN Yeah.
CAPCOM Anything there?
SCOTT Have you got it?
IRWIN Yeah.
SCOTT Watch out. Watch out, Jim, watch out.
You're over by the bench now, don't go any further backward.
IRWIN I thought you meant I was about to lose
the core.
SCOTT No! But just don't step backward any
further. Wait, let me get the picture. I'll just walk over
there, Jim.
IRWIN Okay.

END OF TAPE

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IRWIN Yea.
SCOTT Watch out, watch out Jim, watch out.
You're over by the bench not don't go any further backwards.
IRWIN Oh I thought you meant I was about to
lose the core.
SCOTT No, just don't step backwards any further.
Wait, let me get the picture on you. I'll just over there Jim.
Okay. Okay, here's your cap.
IRWIN Good core, Joe. I like those cores like
that.
CAPCOM Yes sir, so do we. That might even be
a great core.
IRWIN You never know.
SCOTT Put that in my bag. Don't step backwards.
IRWIN I hear you talking.
SCOTT Okay, Joe. I suggest that we drive on
down to that white crater and take the 500's from there, and
I can do 500's while Jim's taking a pan. How does that sound?
IRWIN Okay it's in Dave.
CAPCOM Okay Dave. That sound like a good idea.
We'd like a frame count from you before you leave, and Jim,
you may be coming up on a MAG change depending upon your frame
count.
IRWIN Yea, mines 180.
CAPCOM Roger, better change it.
IRWIN (garble) I wish you'd tack the slope
a little better Dave.
SCOTT Yea.
SCOTT We'll get them to do it next time, but
look at the rover tracks. I'm going to take some pictures of
the rover tracks here, and our boot prints both. Look at the
difference. The rover is light.
IRWIN It does a lot better than we do.
SCOTT Yea, it sure does. Much better.
IRWIN Oh.
CAPCOM A little for the something for the soil mechanics,
sounds great, and we'd like for you to put several scoops of
the soil in bag number 6 on the hand tool carrier when you
get back to the rover.
SCOTT Okay. Go ahead Jim.
SCOTT Yea, that's a great picture but don't
fall down.
IRWIN That would be an even better picture.
IRWIN Well you know the surface here is harder than
it was over near the crater.
SCOTT Yea.
IRWIN At least you get a comparison. Boy those chevrons do
a good job of compacting the
soil.
SCOTT Yea.

SCOTT Yea, you know I sure would hate to
have to climb up here. Boy.

IRWIN Yea, let's work up off the rover from
now on.

SCOTT Yea. But you have to go up some time.
You'd never get here without this thing. (garble)

IRWIN Okay, Joe wants scoops of soil into bag

6. Is that the one on the back of that, yeah it must be.

SCOTT Yea, but that's (garble)

SCOTT Why don't we put them in a sample bag

Joe. Why -

IRWIN Yea.

SCOTT I'll get you a sample bag.

CAPCOM Suit yourself Dave. That sounds good.
and troops, before we leave this area, we want you to brush the
LCRU and the TV camera lens. We're running quite hot on the
LCRU and think there must be a lot of dirt on it.

IRWIN Okay, there is Joe. It accumulates
fairly rapidly.

SCOTT Why don't you. yeah get the down side
of it. With your scoup.

IRWIN Right here.

CAPCOM And Dave and Jim, we're after a large
volume here so shovel it in.

SCOTT Alright. Bag number 167. Beginning to
shovel large volume.

IRWIN I was saving myself for (garble)

SCOTT Maybe if you go up hill Jim. You stand
up hill.

IRWIN Yea me to. (garble)

SCOTT Okay.

IRWIN (garble)

SCOTT Fine.

IRWIN This is fine.

SCOTT Sure that's good.

IRWIN Trouble on large volume you can shovel
it but you can't very well transfer it. Woop, easy, easy.

SCOTT Okay. Good. Get another one, get another
one.

IRWIN About all I can put in there.

SCOTT Yep, that's a large volume.

IRWIN Yeah, you are a champion bag shaker Dave.

CAPCOM Yes sir, yes sir, three bags full.

SCOTT You know what I like about doing the
bag, you know what I like about doing the bags up here Jim.
Thers's no air in them when you fold them up. Okay, 167 goes
in your bag.

CAPCOM And Dave, regarding your question on -

SCOTT After pitch.

CAPCOM the 500 millimeter camera, we want you

CAPCOM to take those pictures from here and Jim can be changing out his magazine while you take the big camera pictures.

SCOTT Very well.

IRWIN Okay Joe, I copy.

SCOTT I guess your thinking of the lighting might change over there and we wouldn't get them because of the, getting closer to it. Looking up sun.

CAPCOM Quite possible and we might want some more photos from there as well. We have the film.

SCOTT Okay.

IRWIN Which mag do you suggest for me Joe?

CAPCOM Stand by.

CAPCOM (garble) papa here.

SCOTT Okay, papa.

CAPCOM And that's (garble)

SCOTT That's what you've got papa Joe.

CAPCOM Roger, or Oboe.

SCOTT Well, let's get it on cause we're just -
or Oboe.

IRWIN I've got Papa out, we'll go with Papa.

CAPCOM Okay, and Dave, can you press on with those big camera pictures.

SCOTT Sure can, couldn't get them till I got the other film out Joe.

CAPCOM Roger. Agree, and Jim when you finish changing you can do dusting and cleaning of the LCRU.

IRWIN Okay.

IRWIN Have you been using the big brush to clean the LCRU Dave.

SCOTT It works fine.

SCOTT Lens cover off.

IRWIN Beautiful.

SCOTT We'll try about 250 and an 8. Does that sound alright to you?

CAPCOM Roger. Sounds good.

SCOTT The camera seems to be working alright.

SCOTT Alright, I'll get you, oh there's some outcrops up at the top.

IRWIN Okay mag papa is on my camera Joe.

CAPCOM Okay Jim. Sounds good. And Jim, when you finish dusting we've got some other tasks for you.

IRWIN You'll have to wait.

CAPCOM Rog, we're in no hurry.

END OF TAPE

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CAPCOM Jim, when you finish dusting we've got some other tasks for you.

IRWIN You'll have to wait.

CAPCOM Rog, we're in no hurry.

IRWIN Dave that MAG's behind the hand controller.

SCOTT Okay.

IRWIN I just used the lens brush on the TV.

SCOTT On the - yeah and it's right in there in that pocket. Don't open the pocket yet, just pull it out - it comes down. That a boy.

SCOTT Houston, are you going to watch my cleaning operation?

CAPCOM Yes sir. Looking right over your shoulder.

IRWIN You can see it needed it.

CAPCOM Rog, Jim. And could you dust our lens while you are there, please, now?

IRWIN Yep. Stand by.

IRWIN Try not to look at me and I'll clean you off. The point up.

CAPCOM Jim, clean the top of the camera, first, please.

IRWIN Point up a little bit this? Oh, okay.

CAPCOM Yeah, that's beautiful. Oh, magnificent. That even made us blink down here.

IRWIN Okay, the top's clean. If you will point up a little bit I will clean your lens.

CAPCOM Jim, could you give us a little help on the tilt we seem to be hung up.

IRWIN Okay GARBLE point GARBLE. Okay.

CAPCOM Thank you, sir.

CAPCOM Why don't you check the oil too, please.

SCOTT Okay, Joe, I've got the 500 pictures and I took first, mount Hadley, two horizontal strips up at the top where there are some outcrops and probably the only two craters that I can see on the side of any sizeable size, and then a vertical strip through one of the outcrops and a vertical strip through another outcrop and then two craters that are in - I guess what we call the forward leading edge of Swan Mountain over there which are quite prominent craters, and then I swung over to a bright fresh one that we see. Over to the northwest, way up and then I turned back around to Hadley Delta and shot upslope at Hadley Delta, and picked off the debris that seems to be exposed up on the top of Hadley Delta. And now the frames say 120.

CAPCOM Roger Dave. 120.

SCOTT As long as you got it out, don't you think you ought to take a picture of those large ones, up to the east, in that suggestion of layering just to the right of the large one.

SCOTT Yeah, I guess so. Let's do that. There's so much up front, Jim, I'm not sure we're going to get anything in them.

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IRWIN Joe, you have some other tasks for me here?

CAPCOM Jim, we're happy. Give us an EMU status check, please. We'd like a frame count off of Dave's camera and then we're ready to move out.

CAPCOM I forgot the 16 millimeter - we want you to change out that mag, run the camera at 1 foot per second, for ten seconds and then go back to normal.

IRWIN Okay, standby. I took about 4 more pictures on the 500, Joe, looking out at Silver Spur and the blocks that are exposed up there.

CAPCOM Okay, Dave, out of curiosity, did you photograph the LM with the big camera?

SCOTT Oh, how did you guess, Joe?

CAPCOM I just can't stay ahead of you.

SCOTT You're ahead of me all the time. Hey the film is jammed in that camera too. That's a problem.

CAPCOM Roger, copy the film was jammed in the back. And change out that magazine please, install a new one and start it running at 1 frame per second for 10 seconds.

SCOTT Okay, we (garble) work.

SCOTT Okay, one frame per second, Joe. Here we go. 10 seconds.

IRWIN Okay, and why don't you hop on and let me get your seat belt. We've got to get moving. Time is a wasting.

SCOTT Green light isn't working in it. Here's 10 seconds.

IRWIN Okay.

IRWIN Okay, we tried it at one.

SCOTT Okay, Jim, why don't you hop on. If you can. I forget we are tilted backwards.

CAPCOM Jim, while you are there can you look over and get a frame count off of Dave's camera please.

IRWIN Yeah, as soon as he turns a little bit more to the left.

CAPCOM Okay.

SCOTT Can you sit back now, Jim?

IRWIN Okay, just a minute - get your pocket. I don't know why your suit is much wider than mine.

SCOTT I'm wider.

IRWIN Don't sit up - sit back.

IRWIN I'm trying to.

SCOTT Let me swing around and get my camera count on you.

IRWIN Okay, your belt's on.

SCOTT Well, when you sit down I'll get yours.

IRWIN Yeah, look at it there down sun (garble)

IRWIN Okay, it's 130.

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CAPCOM Roger.
IRWIN On Dave.
CAPCOM And Jim while you are there could you go to
back to normal on batt please. or off.
IRWIN Going back to 12.
IRWIN Back to 12 frames per second. You want me to
run it at that speed. Tell me to turn it on at that speed
now, Joe, and see if it will work.
CAPCOM Standby on that Jim. Yeah, let's give it a go
and see if it will work.
IRWIN Okay, it's coming on now.
SCOTT Why don't you wait until we start driving.
Oh shoot, I forgot the tv. I think it might be - I think it
might be working, Joe.
SCOTT We're at the full mark on the mag. Joe, I'm
going PM1WB.
CAPCOM Roger, Dave and Jim turn off the DAC until
we start driving and then let's get some movies.
CAPCOM Okay troops we're looking beautiful. We'll ask
you to move back towards the west, towards the large block
you saw there which we think is near Spur Crater and drive
towards the fresh crater that you have described to us.
SCOTT Okay, Joe.

END OF TAPE

CAPCOM Rover, do you read Houston?
IRWIN Yes, I'm working Joe.
CAPCOM Okay.
SCOTT Okay, Jim, here we go.
SCOTT Will you turn on the Drive power for me?
IRWIN To up?
SCOTT Yes, the up ones up and the down ones down.
IRWIN Oh, I get em.
SCOTT You're in as bad a position as I am.
IRWIN They're off.
SCOTT Okay. That's the stuff.
SCOTT Okay, Houston. We're moving out.
CAPCOM Roger. Got your mark. Dave, we're thinking -
we want to drive over towards that large block, and if you think
it's reasonable, we'll ask for about a 15 minute stop there,
and afterwards we'll move on towards the fresh crater. What
do you think?
SCOTT Oh, I think that's a good idea. I don't think
we're going to get any more variety of anything by going further
to the east on the front, Joe. I think we've seen the variety
that we're going to see except for working our way back.
CAPCOM Dave, we agree precisely with that down here.
We think that from your description, that's exactly what we've
been reading and that's why we want you to move to the west.
SCOTT Okay, now here's a little fresh crater, Jim.
White albedo, but I think that's probably secondary. I don't
think that's excavated or anything, do you?
IRWIN No.
SCOTT Let's head for that block.
IRWIN Yes.
SCOTT I lost that block - I hope you - it's just
over the ridge I guess.
IRWIN Yes.
SCOTT We'll take it sort of slow here going down-
side.
IRWIN Yes, we're heading 278.
CAPCOM Roger, Jim. And you might want to start
the dac?
IRWIN In 3 4 5 range? Yes, I'm glad you reminded
me.
IRWIN Remind me to stop it when we get there.
IRWIN Boy, looking up slope, look how much more
Hummocky it is? It's just a different terrain.
SCOTT It sure is. It sure is - hummocky and driving is
much sportier.
IRWIN Yes.
SCOTT Hang on. There we go. This Rover is super.
SCOTT Oh, mercy. Yes.
SCOTT I ever drove.

IRWIN Yah.
SCOTT What do you think we ought to do here, Jim.
IRWIN Stop.
SCOTT Atta boy. I wish I could lean up too.

Okay, Rovers stopped.

IRWIN Okay, it looks like from this position - I'd say that's probably Spur down there, the large one, Dave.
SCOTT Oh, yes, definitely.
IRWIN It's got blocks in the north rim.
CAPCOM Beautiful, Jim. Try to get a lock on that beauty. Maybe some other landmarks around it so we can drive down to it.

IRWIN No problem there we -
CAPCOM Okay.
IRWIN Get Spur for you, no problem.
IRWIN Get the readouts.
SCOTT Be careful you don't fall down - getting out.
IRWIN Okay, the readings Joe, 287 347 069 050 097.
SCOTT FM 2D.
IRWIN 100 80 90 and motor temps are lower limit.
CAPCOM Okay, Jim. Copied. And proceed carefully now.

SCOTT You ought to take that tool off of there. It's just hanging you up everytime you turn around.
IRWIN I haven't had it on at all this morning, Dave.

SCOTT Really? You haven't hung up on it?
IRWIN I haven't had it on.
SCOTT No, the tool on the side of the Rover.
IRWIN Oh, I see.
SCOTT Your feet keep hanging on it. Man is this a steep slope.

IRWIN Yes.
SCOTT It sure is isn't it?
SCOTT Joe, for lack of good antenna pointing, I'm going to bypass the TV this time.
CAPCOM Okay, Dave. Whatever you say.
IRWIN PM 1WB.
CAPCOM And Dave, we're assuming that you can't get around in the right position beside the Rover to point the antenna adequately.

SCOTT Yes, that's right, Joe. And the slope is real steep and like I mentioned before, the siting device doesn't transmit enough light to really make it very easy to find the earth. It would take me a couple of minutes there just to find you and I think you've seen the same thing, but if you like, I'll give it a try.

CAPCOM Negative, Dave. We agree with you exactly. We're in good shape. Just proceed carefully on the soft powder.

SCOTT Yes, we're going to do that cause it really is. But you can't say that we didn't sample the Apennine Front.

CAPCOM Jim, did you turn the Dac off?

IRWIN Yes, I did, Joe.

CAPCOM Okay, good thinking.

IRWIN Half a mag.

CAPCOM Okay.

SCOTT Okay, let's attack that boulder, got your hammer?

IRWIN If I put it back on I do.

SCOTT Got to be a bear to get back up there you know.

CAPCOM Hey troops, I'm not sure you should go downslope very far - if at all - from the Rover.

IRWIN No, it's not far.

SCOTT Let me try it Jim, you just stay there. I think we can sidestep back up.

CAPCOM Well, make sure you check it now. Just proceed carefully.

SCOTT Okay, I'm halfway and I'll go back first. Why don't you stay there, Jim.

IRWIN Okay. Come back up.

SCOTT The Rover makes it feel so easy.

IRWIN I know it.

SCOTT Should have parked right beside it. Think I will.

IRWIN Well, if you will, I'll walk down Dave.

SCOTT Want me to carry some of those tools.

IRWIN I can carry them easier.

CAPCOM Okay, Dave. How's the footing?

SCOTT I think that I'll - the footing is alright except that you have to work pretty hard to get back up so I think what I'm going to do -

CAPCOM Jim, are still up near the Rover?

SCOTT Wait a minute till I get there, Jim.

IRWIN Yes.

CAPCOM Jim, let's ask you to walk around to the front there, and just take a general rough guess as to where the earth is, you don't even have to use the siting device. Just point it about correctly and we're going to give the TV a try.

SCOTT Oh, Joe. I can see where the earth is in general. We're going to make a change here. I'm going to drive down. If I get successfully down there, then Jim can walk down. So we don't have to expend all the energy.

IRWIN Man, there's a beautiful little rock track here in a circular arc.

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SCOTT Really.
IRWIN Looks like it's rolled into the hill. It's
amazing.
SCOTT Well, photograph it.
IRWIN Yes, I am.
IRWIN Instead of going straight down the hill, it
curved into the hill.
SCOTT That right?
IRWIN A little angular fragment, Joe, about 2 inches
long.
CAPCOM Roger, Jim. Fantastic.
IRWIN Curved into the hill and stopped.
CAPCOM And Dave, are you driving now?
SCOTT No, Joe. I'll give him a call. Stand by.
IRWIN Meantime, I'll be taking a pan from here,
Dave.
SCOTT Yes, good idea.
CAPCOM Good idea, Jim.
IRWIN Looks like it's going to be our high point.
CAPCOM Beautiful.

END OF TAPE

SCOTT Hey, Jim. Could you watch me as I back up here?

IRWIN Sure can.

SCOTT Got your eye on me?

IRWIN I have my eye on you.

SCOTT (garble) in here.

SCOTT I think I'm going to move downslope a little bit.

IRWIN (garble).

SCOTT Yeah.

IRWIN Very good.

SCOTT You do hope, Jim.

SCOTT (garble).

SCOTT (garble).

IRWIN (garble).

SCOTT (garble).

IRWIN I'm going to finish my pan.

CAPCOM Roger, Jim and Dave. Proceed very carefully now, please.

SCOTT Oh, we are. We're doing it really cool.

CAPCOM Super-cool.

SCOTT Super-cool.

SCOTT How am I doing, Jim?

IRWIN Doing okay. Want me to come over there and get on?

SCOTT No, I want you to stay there.

IRWIN SAM complete, Joe.

CAPCOM Roger, Jim. Copy that. And I understand you're proceeding down towards that large block now.

IRWIN Very gently.

SCOTT They ought to even put the old girl downhill here, Jim.

IRWIN (garble).

IRWIN Oh, we should have (garble).

CAPCOM And Dave and Jim. When you stop, we'd like for you to just take a rough guess with that antenna. Give us the right switch setting and we're going to give it a try with our big dish down here.

SCOTT Okay, stand by.

SCOTT Too far from the rock.

IRWIN Okay, (garble).

SCOTT Okay, Jim. You can come on down now.

IRWIN Yeah.

IRWIN I estimated what -- 20 degrees slope?

SCOTT I don't know.

IRWIN L5 or 20?

SCOTT Closer to 15.

IRWIN Well, here.

IRWIN (garble).

IRWIN Over to the back wheels off the ground.
SCOTT I think I'll get back on.
SCOTT I'll tell you what, Jim. We'd better abandon this
one.
IRWIN (garble).
SCOTT Here, come on down. You come on down and
get on.
IRWIN Okay.
IRWIN Well, let me take a picture here anyway.
SCOTT Yeah, take a picture.
SCOTT Are you ready -- Let me hold that rover. You
come up and look at this. With this rock, it's got grease in
it. A light green.
IRWIN Okay. Okay, I'll just stand here till you're through
and then we'll take a look at it.
SCOTT Yeah.
SCOTT This is the first green rock I've seen, light green.
CAPCOM Roger. We're coping all of it.
IRWIN Okay.. Where did you want me to hold it?
SCOTT Come down and stand on your side.
IRWIN On my side?
SCOTT Yeah.
IRWIN Okay.
SCOTT And you stand there and take a break? (garble).
IRWIN Okay.
SCOTT Okay. Are you firmly situated there?
IRWIN Yeah.
SCOTT Okay.
CAPCOM Now Dave and Jim, use your best judgment
here, the block is not all that important and we'd like you
to spend most of the remaining time at spur crater. The re-
maining front time, that is.
SCOTT Roge, Joe. Sure will.
CAPCOM And talk to us if we can give you any help
here.
SCOTT Yeah, we're okay. It's just that this slope
is pretty steep and I just did not take too much time here.
CAPCOM Yes sir, we are hearing you.
SCOTT (garble) is all it is.
SCOTT (garble)
IRWIN About halfway up. Maybe I can look down
some to see it. It looks like light green layer, not necessarily
a thick layer.
SCOTT (garble).
IRWIN Light green.
SCOTT You mean on the surface?
IRWIN Hey, you're right.
CAPCOM Can you photograph it, Jim?
SCOTT I could -- I took a couple.
IRWIN Easy, Dave.
SCOTT Yeah.

IRWIN Okay.
IRWIN Did you take it down some?
SCOTT Yeah, I took two down some a couple of feet.
IRWIN Okay.
SCOTT (garble) in here.
IRWIN It'll be great if we could get some of that
green material.
SCOTT I'll get it. I think I can get it with my
(garble) card.
IRWIN Hey, that's great.
SCOTT There seems to be a surface material or else
it's a very changable (garble).
SCOTT (garble).
IRWIN Are you sure it's green and not just white
albedo again?
SCOTT It looks green.
IRWIN It looks green and I noticed just downslope
with the rock. You take up the surface where there's some
more green there.
SCOTT Here's a little.
IRWIN This rock is about 3 meters long. But you
described it subangular. Very rough texture surface and the
surface facing northwest is the dark typical breccia and it
looks like -- what appeared to me like there's a layer there
that might be a foot and a half, 2 feet thick. Appears the light
greenish color. Dave is sampling it now.
CAPCOM Roger, Jim. Copy you loud and clear. Superb.
IRWIN And on the side to the -- the southeast is
again the breccia. Isn't that right, Dave.
SCOTT Yeah. And I got a little frag -- Don't
drop it.
IRWIN There. And I got some green and I got a
frag out of the breccia.
IRWIN Fairly loose.

END OF TAPE

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SCOTT It's fairly loose breccia, as breccias go, Oh, and there's a great big white clast on the inside, but it's man, like inch or so.

IRWIN If you want I'll - -

SCOTT Nope, I'll get it.

IRWIN Okay.

SCOTT Stay in there. Let me work.

SCOTT That does it.

SCOTT Okay. 168, Joe. Got a little bit of the green and I got a chunk about 3 inches of the rock itself.

CAPCOM Roger, David, copy.

SCOTT And I think we'll call it quits on that one.

CAPCOM Sounds good Dave, we're interested in moving toward Spur, but carefully.

SCOTT Yeah. But carefully!

SCOTT Okay, Jim, just stand right there and let me ease on down.

IRWIN Yeah. It's going to take us a while to work down slope.

SCOTT Yeah.

IRWIN I think it'll probably be best for you to get on first.

SCOTT Yeah, I think so.

SCOTT Put this where we won't lose it.

IRWIN Hand it to me, I'll put it under my seat.

SCOTT I can put it under mine. It won't go anywhere.

SCOTT Trouble is, if I get on first, I'm not sure you're going to have a seat belt.

IRWIN Well, I don't know that I want to drop it. I can - -

SCOTT Hold off. We're not going to go that fast here.

IRWIN At least that's for sure.

IRWIN Okay.

SCOTT Okay, I'm on. Did you get the other strap in?

IRWIN Yeah, let me strap you in. Dave, just a minute. Let me get settled down here first.

SCOTT Okay.

SCOTT Okay. I'll tell you what might be better Jim. Let me ease on down the hill here to a flatter spot for you to get on. Okay?

IRWIN Okay. Yeah. No sweat.

SCOTT You see right at 1 o'clock there, it levels out in that little depression.

IRWIN Right down here, okay?

SCOTT Okay. Look why don't you move back there and let me drive down. Move away from it so I won't hit you.

IRWIN Yeah, let me back off.

SCOTT Okay?

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SCOTT Back off good. Jim.
IRWIN I just as soon meet you down where
it's level.
SCOTT What?
IRWIN If you want, I'll meet you at Spur.
SCOTT Oh no.
SCOTT I'll just go right down here. It's
easier for you to get on.
IRWIN Just so you you stay up hill? The up-hill
side.
SCOTT Yeah.
SCOTT There.
SCOTT That's a nice spot, right there.
IRWIN Okay.
SCOTT There.
IRWIN Okay.
SCOTT Why don't you grab your seat belt and let
me hold it for you and maybe give it a try.
IRWIN No, I'll just hang on Dave.
SCOTT Easy. Easy.
IRWIN Okay.
IRWIN Dave?
SCOTT What? Okay.
SCOTT Okay, Joe, we're moving now.
CAPCOM Okay, Dave, and Jim, if you can easily turn
the camera on, might be a good place.
IRWIN Oh, no chance right now, Joe?
CAPCOM Oh, okay.
IRWIN But if - ease our way down.
SCOTT Okay, Jim?
IRWIN Oh, yeah.
SCOTT I'll take a little right turn here.
Okay. Came up alright; should be able to go down alright.
IRWIN Going down's a little more tricky.
SCOTT Yep. Yeah we can get along with a couple
of christies here and there.
IRWIN Over christies, heading right for Spur, Joe.
CAPCOM (garble) like that.
SCOTT Not bad is it?
SCOTT Jog here.
CAPCOM And, Dave, give us a call as you come up
toward Spur. We've got some parking instructions.
SCOTT Parking instructions. Okay.
SCOTT Let's see do we want to hit the upper rim
or the lower rim of Spur?
IRWIN Oh, you see that large block on the -
SCOTT Yeah.
IRWIN The Northern rim.
SCOTT Yeah, I think we should work down to the
Northern rim, right?

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IRWIN Yeah, if we're going to sample any
blocks there on the rim, that'd be the place to do it.

SCOTT Yeah.

CAPCOM Sounds good to us. And Dave, we'd like
for you to park east of the area you're going to be working
in so we could look down sun and park facing west and we'll
give you an AB update later.

SCOTT Okay. We're in good shape, Joe.

IRWIN That one wall there has quite a bit of
debris, doesn't it?

SCOTT Yeah.

END OF TAPE

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IRWIN There's quite a bit of debris, doesn't it.
SCOTT Yea. And it looks like it's again has
a linear pattern runing north and south.
IRWIN Almost does. We're talking about the
debris that's exposed on the north wall of Spur, and the slope
here at Spur is 08 to 10 degrees.
CAPCOM Roger.
SCOTT Okay, I'm turning left on a level slope
here, (garble) (garble) by Alpha. Traveling in a big creater.
Okay, a nice place to park.
IRWIN Yea, it's a good place.
SCOTT Good place. Let's take a break here.
IRWIN Yea.
SCOTT Yea, I think we're just about level
right there. Okay.
IRWIN Okay Joe, I'll give a reading if you
want Dave.
SCOTT Yea, I'll get the TV on.
CAPCOM Go ahead Jim.
IRWIN We're at Spur creater Joe. I'll give
him the shadow device too. Okay the heading is 290 349 7.3
4.7 095 100 82 90 motor temps are both lower limits.
CAPCOM Hoping and standing by for the shadow.
IRWIN And the shadow is 4 degree left. Let's
get the other 2. (garble) pitch.
SCOTT Yea, the pitch is about 3 degrees down
and the roll -
IRWIN You have to hold it in a (garble) position
I guess.
SCOTT If I can get it there it's standing.
IRWIN The roll is 5 degrees right.
CAPCOM Roger we copy, and it was that -
SCOTT And Jim why don't you get off first -
CAPCOM and it was that first land that that
heading is still a good heading. We'll be back with you.
IRWIN Okay. Yea. Okay
CAPCOM And Dave and Jim, -
SCOTT Hold on, I'm going to take a pan.
IRWIN I'm (garble) the TV.
CAPCOM And we're looking at about 30 minutes
worth of time here at this station.
SCOTT Oh good.
IRWIN Okay Joe, we're going to FMTV now.
CAPCOM Roger.
IRWIN And I'll give you general pointing and
you can try your big dish.
CAPCOM Okay, Dave, try to use the sight on this
one and ust make sure that the filter is flip up out of the way
please, the sun filter.

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SCOTT (garble)
CAPCOM Dave, we had the picture momentarily.
We've lost it now, are you still sighting the antenna?
SCOTT Yea, have you got it now.
IRWIN We picked up some more green material here, Dave.
SCOTT Are you sure it isn't that light gray
albedo stuff?
IRWIN No, it looks green.
SCOTT (garble)
IRWIN See the contrast.
SCOTT No.
IRWIN No, I see white, I see a light green,
and I see a brown.
SCOTT Hey Jim.
IRWIN Yea.
SCOTT Stand where you are and give me alinement
on the antenna, and see if I can get pointed at the earth. You
can turn to you right, there take about 3 steps right and if
you look up, don't fall back, just look up, you will be able to
aline the antenna in your position relative to the earth. You
have to take your visor up probably. Okay, do you see the earth
up there, take it back -
CAPCOM Dave and Jim. You could look at the
meter on the LCRV and pike up AGC while you move the antenna.
Make sure also that the sun filter is up off the sighting devise.
SCOTT Joe, it has been ever since we started
the shade down and everything else.
IRWIN It's just not that much.
CAPCOM Rog. We understand. Just checking.
IRWIN That's good.
SCOTT Okay, try the ACG, like radar.
CAPCOM Okay, that's good. Beautiful, beautiful.
Right on the money.
IRWIN You could use that sound to lock in Dave.
SCOTT You know I did that, I didn't even look
at the sight lift I just used your AGC.
CAPCOM Alright.
IRWIN You get the sound when your locked on too.
(garble)
SCOTT Okay Jimmy. Let's go to work.
IRWIN Roger. You don't think there's green here.
SCOTT No Jim, I don't know. I think it's a gray.
It's the difference between the gray and the albedo. I think
that would be my guess.
IRWIN It might be the visor that makes it
look green. But it's worth handling. See that large rock on
the northwest side just on the inner edge there.
SCOTT Yes.
IRWIN Clearly a breccia look at the clasts, you
can see the clasts from here.
SCOTT You sure can.

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IRWIN And it looks like it's a different
color rock. Well it's a dark -
SCOTT Okay, let's go sample the rim over here.
IRWIN Okay.
SCOTT Down sun. To your handy dandy camera
movement.
IRWIN Houston, you should be pointing right
at the LM.
CAPCOM Rog, Jim. We're looking.
SCOTT Okay Jim. There's a good pile of rocks
right here..
IRWIN Hey look at that light colored rock with,
it almost looks like a white vein on top of the other rock.
SCOTT Yea, look at that.
IRWIN How about that.
SCOTT Yea, we'll get that one.
CAPCOM Get it now.
SCOTT Yes. It's a breccia. It's a dark gray
rock that looks like a actually looks like a big pennacle
with a small gray and white breccia on top of it. The pennacle
about 6 inches across and 4 or 5 inches high. On top of it,
it is about a 2 to 3 inch subangular frag with the light gray,
medium gray matrix and about 20 percent white (garble) Really
unique. It stands out, it's amazing.
SCOTT Okay Jimmy. Let's gather some data.
IRWIN You've got a sample there right.
SCOTT Yea.
IRWIN Okay.
IRWIN Got it.
SCOTT Yea.

END OF TAPE

IRWIN Get it.
SCOTT Yeah. Okay. Okay.
IRWIN Oh, there are sparklys and lots of breccia.
SCOTT Look at the soil it's sort of caked on the the top, though.
SCOTT Yeah, another black matrix fine grained with white clast - millimeter size - there are some very fine grained little sparkles in there though.
IRWIN I even see some vesicles in it.
SCOTT Yeah, look underneath there, Jim.
CAPCOM Just standing by for the number Dave.
SCOTT 94. Yeah, let me get the other one that is sitting right next to it. Let's have - the upper layer of the soil here is caked.
CAPCOM Standing by for the number, Jim.
IRWIN Why don't you gather some soil.
CAPCOM Have we got 94.
SCOTT Joe, we gave it to you but you blocked us.
CAPCOM Thank you.
SCOTT Yeah, let's get soil in this bag. Okay. Right there by the rock.
IRWIN Yeah.
SCOTT Leave the rock hole.
IRWIN Yeah.
SCOTT Is that a glass one, sitting right below it.
IRWIN It sure looks like it. It was under it wasn't it. Let me take a picture. Just a minute, let me take a picture and why don't you pick up that little piece of glass and put it in the bag too.
SCOTT Okay. That must have been under the rock.
IRWIN Yeah.
SCOTT Okay, I got the picture - I got that little rock.
IRWIN Okay, at a boy.
SCOTT Okay, let me get a picture.
IRWIN I think the next order of business is that deep one there.
IRWIN Okay, just to the west of you, Dave is some of that what we've been calling green material, clearly visible, see what I mean?
SCOTT Right here?
IRWIN Right here.
SCOTT Yeah, that's just a light.
IRWIN Okay, I'd call it light gray but we'll check it when we get home.
SCOTT Well, it's definitely different from the next rock or the one we just picked up.

IRWIN Yeah, you mean - well look at this one right here.

SCOTT That's what I am talking about.

IRWIN Okay. Sure is. That's awful big but I think we ought to sample here anyway all those little frags.

SCOTT I've got to admit it really looks green to me too Jim but I can't believe it's green.

IRWIN Oh, it's a good story - talking about green cheese. Who would ever believe it. I hope it is green when we get it home.

SCOTT Yeah.

IRWIN Oh, my it is green. It is green.

SCOTT I told you it was green.

IRWIN You're right, ooh, fantastic - hey hold this, wait a minute I can't put this in the bag yet I've got to look at this. This is got to be something. And that looks almost - now it's gray. The visor makes it green, Jim. It's a different shade of gray.

IRWIN Yes, I put my visor up too.

SCOTT But it's a very light grain, very fine grain, sure looks like a basalt with some very less than millimeter size vesicles in it, maybe 5 percent are so to subangular rock. It's friable. I can - maybe it's not a basalt. It's friable - I can scrape it off with my glove and I can put some streaks in it. In case anybody wonders what that is when it gets back but it's definitely different from anything we've seen before. 195 - let me get another one here.

CAPCOM Roger, 195. And it sounds green to me.

SCOTT With the visor on, Joe, I was about ready to call it a dunite, but I opened up my visor and I was wrong. I didn't get to call it what I wanted to. Here's another one of the same stuff, Jim. Okay, why don't I take a picture and you get a sample of the soil, okay. Why don't you just scoop in between them.

IRWIN I think this is a big frag here, but it's broke.

SCOTT Yeah, when it hit all these pieces are roughly the same.

IRWIN Yeah. Not much fall here, really.

SCOTT No, it really isn't

CAPCOM Dave and Jim is it your impression that you are sampling on the ejecta point for the spur crater, now?

IRWIN Yes sir, probably from the deepest part, because we're right on the rim.

CAPCOM Sounds good.

SCOTT Okay, 195. Wouldn't you agree with that, Jim?

IRWIN Okay. Now let's go down and get that unusual one.

SCOTT Get that unusual one. This is and there's another unusual one, look at the little crater here and the

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SCOTT one that's facing us. There is a little white corner to the thing.

CAPCOM Okay, Dave get as many of those things as you can and you might be watching for a place where you think the rays might help you.

SCOTT Yeah, I think we can probably do a rake here, Joe.

CAPCOM Okay, sounds like a good place.

SCOTT Boulder over there down in front of us, I'm sure you can see - there is a boulder down in front of us I'm sure you can see Joe which is gray and it has some very outstanding gray clasts and white clasts and oh boy, it's a beaut. We're going to get ahold of that one in a minute.

SCOTT Okay I'm -

END OF TAPE

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SCOTT Gray and has some very outstanding gray clast and white clast. And oh, boy, it's a beaut. And we're going to get a hold of that one in a minute.

IRWIN Okay, I have my pictures, Dave.

SCOTT Okay, let's see. What do you think the best way to sample it would be?

IRWIN I think probably -- Can we break off a piece of the clot underneath it?

IRWIN Or I guess you could probably lift that top fragment right off.

SCOTT Yeah, let me try.

SCOTT Yeah.

IRWIN Sure can.

IRWIN And it's a white clast and it's about -- Look at that. Look at the LM.

SCOTT Oh.

IRWIN You can almost see twinning in there.

SCOTT Guess what we just found. I think we found what we came for.

IRWIN Crystal rock.

SCOTT Yes, sir. You better believe it.

CAPCOM Yes, sir.

SCOTT Pladge in there, almost all pladge.

IRWIN (garble)

SCOTT As a matter of fact -- Oh, boy, I think we might ourselves something close to an orthocite. Cause this crystal in there is just almost all clasts. What a beaut -- That is really a beauty. And there is some -- there is another one down there.

IRWIN Yeah, we'd get some of these.

CAPCOM Back it out.

SCOTT Beautiful. Hey, let me get some of that clod there.

IRWIN No, let's don't mix them -- let's make this a special one. I'll zip it up.

SCOTT Okay.

IRWIN Make this bag 196 a special bag.

CAPCOM Yes, sir.

IRWIN Our first one.

SCOTT Don't lose your bag now, Jim.

IRWIN Oh, boy.

SCOTT Okay, let's get some of the other -- maybe -- Let me take a picture first.

IRWIN I got it. No sweat.

SCOTT Now, we're got to think on how to get that other piece there. Maybe if you could put your scoop in it, break off a chip, do you think?

IRWIN I think it's a just a clod, don't you?

SCOTT I don't know. Try it. Put your scoop there on the middle and break off a chip.

IRWIN Yeah.
SCOTT It's not a clod, is it?
IRWIN Yep, it is a clod.
IRWIN I'll take these space here.
SCOTT Yeah. Let me get you a bag.
SCOTT Let me take a picture first. so you know
which one we got. Okay. Go ahead.
IRWIN Number 170.
CAPCOM Roger. 170.
CAPCOM And Dave and Jim. Are you working on the
outside of the crater or are you over the -- the lip right
now?
SCOTT Just a tad over the lip on a little
bench but it's --
IRWIN Dave, did you hold that one?
IRWIN I don't know whether it'll fit in the bag
or not.
SCOTT No. It dropped. See if you can pick it up
again.
SCOTT I think it'll fit in the bag, Jim.
IRWIN A little flangeable.
SCOTT Yeah, it really is.
SCOTT I think I can get it with the tongs here.
IRWIN Yeah.
SCOTT There's a contact sort of on there. We
ought to try and get the contact if we can.
IRWIN Okay, Dave. Open the bag.
IRWIN Okay, I got.
SCOTT That aboy. Good show.
IRWIN (garble) pick up picture. Okay, roll that
DDF.
SCOTT Let's go get some more of that.
SCOTT I think we ought to get over that big rock.
IRWIN Yeah, we're getting there.
SCOTT Before we run out of time.
IRWIN All right.
SCOTT Cause I think that big rock is probably the
more important.
IRWIN It's a big (garble).
CAPCOM Dave, we think you might be about to run out
of film. Maybe you better check that now.
SCOTT All right, Joe.
SCOTT Jim, this one we got to pick up and then
we'll go to the big rock.
SCOTT And if you could -- put that in my bag then
check my film --
SCOTT Joe, this crater is a gold mine.
CAPCOM And there might be diamonds in the next one.
SCOTT Yeah, babe.

SCOTT (garble).
CAPCOM Jim, get a reading on Dave's camera for us, please.
IRWIN Oh, you got a lot left. He's only reading 145.
CAPCOM Roger, Good. Sounds good.
SCOTT Got her, Jim?
IRWIN Yeah.
CAPCOM Dave and Jim, did you fill a bag after 170, if so we missed the number and we can probably sort it out later.
SCOTT This one. No -- I think that was the last one, Joe. We'll rely on you to sort it out later.
SCOTT Okay, I have all -- Look at this, Jim.
IRWIN What a contact.
SCOTT Man, oh man. I got about a 4 incher, Joe. It's a subrounded and on one half of it, we have a very dark black fine green basalt with some -- it looks like some very thin glass in it of plagioclase nothing else. And in one region there is some millimeter type vesicles along a linear pattern very close to the contact. And on the other side of the contact, we have a pure solid-white fine grained fragment which looks not unlike the white clasts in the 14 rock but it's a beautiful contact in here. And we'll call this one bag number 198 -- 198.
CAPCOM Roger, copy 198. And Jim, you may have dropped your sample bags.
IRWIN Yeah, I dropped one.
SCOTT He dropped one, Joe, thank you.
IRWIN I don't know what we'll do without you, Joe.
SCOTT Hey, isn't that super?
SCOTT Get the picture.
IRWIN Yeah, I got the picture. Don't fall down.
SCOTT We'll ease over to that big rock. Looking on the way for anything else unusual.
SCOTT It's another clod that evidently hit. Let's sample it just to get the -- distribution around the circumference of the rim here.
IRWIN You want to put that bag in my pocket.
SCOTT Yeah, I will as soon as I zip it.
IRWIN I think it's in there.
SCOTT Okay.
SCOTT Okay, got enough fingers left to get me another one?
IRWIN Yeah, what would you like -- the bag?
SCOTT Oh, yeah. The bag.
IRWIN Why would you want me to use the scoop.
SCOTT I don't think we use the scoop on this one
I think it's going to --

SCOTT Oh, look at this one.
IRWIN Diamonds.
SCOTT (garble) move out -- of your shadow.
SCOTT No. Is that glass or is that basalt?
SCOTT Look at that right there.
SCOTT Let me take a picture from where it came
from under that rock.
IRWIN Think so?
SCOTT Man, it looks like a big piece of glass.
SCOTT That's a bubble set. Oh, look at that.
IRWIN That's a glass coated buccia.
SCOTT Yeah, but look at the glass.
IRWIN Okay.
IRWIN It's shiny.
SCOTT 199.
CAPCOM Roger, Dave. Thank you.
SCOTT We'll get some more of this, Jim.
IRWIN (garble)
SCOTT (garble)
SCOTT Here's another piece of frag that it went
with.
IRWIN (garble).
CAPCOM Dave and Jim. We're very pleased with
your document of samples here. We think you ought to get
some thought pretty shortly now to getting up a rate
sample if you can find a good area. And then we're going
to go for some volt collection. Just a lot of soil fill in
sample or collection bag six.
SCOTT Okay, it seems a shame, we got to go over
and sample that big one there.
IRWIN Yeah. We'll do that.
SCOTT Go ahead.
CAPCOM And Dave, you're going to want a (garble).

END OF TAPE

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SCOTT Okay.
IRWIN It seems a shame. We ought to go over and sample that big one there.
SCOTT Yeah. We'll do that.
SCOTT Go ahead.
CAPCOM And, Dave, you're going to want to cinch up Jim's collection bag probably before you go much longer. It's coming very loose there.
SCOTT Okay. Let me do it right now, Joe, so we dont' forget it.
CAPCOM Roger. We sure don't want to lose that one.
IRWIN (garble) pretty good in there, don't you?
SCOTT It turned a little to the right, Jimmy.
I mean left, I'm sorry.
SCOTT It sure has come off. I don't know why.
IRWIN Yeah.
SCOTT Oh, yeah, (garble)
SCOTT I think it fixes you, partner.
CAPCOM Okay, Dave, while you're working there we're thinking that we'd prefer just some very quick sampling of large rock, if at all; perhaps just a quick photographic documentation of that large rock and then some light samples.
SCOTT Okay, Joe. Let me get Jim's bag - wait Jim, don't go anywhere yet.
CAPCOM Dave and Jim, the (garble) input now is that we want to forget that large block entirely. We want as large a collection of smaller frags as you can get us and you'll probably be working near the rover for those.
SCOTT Understand, Joe.
CAPCOM And we're coming up on about 10 to 15 minutes remaining here.
SCOTT Okay. Okay, hang on partner. I think I've got you; better. Okay, let me get your - unknot your scoop over. Turn around.
SCOTT Okay, why don't you go get the rake on.
IRWIN Okay.
SCOTT I'll get the gnomon. While you're putting the rake on, I'll photograph this thing anyway.
IRWIN Okay. I think it looks very much like the 14 rocks.
CAPCOM At a boy, Davey.
SCOTT Though, it looks maybe a little darker gray.
IRWIN Okay, Dave, I'm set up whenever you are.
SCOTT Okay, be right down.
SCOTT A convenient piece broken off right here.
SCOTT Okay.
SCOTT Here I come.
IRWIN Dave, how about over here?
SCOTT Yeah. Find a good spot.
IRWIN Yeah and while I'm raking, there's a rock

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IRWIN over there that has a liner pattern in it, that you might want to look at while I'm raking.

SCOTT Okay, let me get the pictures of it please.

CAPCOM And, Jim, how's your raking going. Are you pulling off any small frags?

SCOTT (garble)

IRWIN Haven't started yet, Joe.

SCOTT Got to document the area first, here, Joe.

CAPCOM Roger. Couldn't miss that.

SCOTT How, about right about here, huh?

IRWIN Yeah, that's what I was thinking.

IRWIN That's good, and see that rock over at your - south of you.

SCOTT Uh oh, I just ran out of film.

CAPCOM Roger, Dave.

SCOTT Oh my! Well, we can get that later. Let me change film mags while you rake, Jim.

IRWIN Okay.

SCOTT And you'd better take the - -

IRWIN I'm just - I'm surprised you're running out already, though you must have taken a lot of pictures over there.

SCOTT Yep.

CAPCOM And either Dave or Jim - -

CAPCOM once again our TV5 is starting to warm up considerably. We'd like for you to clean off the camera top and the lacru when convenient, please.

SCOTT Alright, Joe. And mark bag 171 for a frag off of that big boulder. I'm pretty sure it was exposed right on the surface fairly plain right next to the boulder and looked like the same material.

CAPCOM Roger. Wouldn't be at all surprised.

SCOTT And, I think I'll brush off the camera for you and I can brush off my camera before I change the film.

IRWIN And, Joe, this looks like a pretty good place to rake. I've raked one slough here about 2 feet long and I've collected - oh, about 15 rocks.

CAPCOM That's a jackpot.

SCOTT Put them in a big pile; I'll be right over.

IRWIN Okay.

IRWIN Oh, I don't know whether I want to do that Dave.

SCOTT Okay, well then, I'll be right over.

IRWIN Yeah.

SCOTT I'll just do my film --

IRWIN Though, I think we can fill up the bag pretty fast here.

SCOTT Okay, well you take the pictures and I'll

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SCOTT just change my film later.
IRWIN Okay. I'll - Dave, save the film changing here. Let me get you a bag.
SCOTT Oh, yeah. You did get a bunch. 172.
CAPCOM Roger.
IRWIN Okay. Got a little more swath.
SCOTT Yeah. It's about 1 meter long and one rake width wide.
SCOTT Yeah. Good.
SCOTT Bath on some. Most of them are rounded. Nice size.
IRWIN Let me do another one.
SCOTT Oh, you're stepping on my tongs, it's alright. I'll get them.
IRWIN I can get them with the scoop here in a little bit.
SCOTT Yeah.
SCOTT Sure miss that yo-yo.
IRWIN Oh, good that's 3 swaths 1 meter long apiece.
IRWIN Dave bag in for you; let's shoot for a full bag. What do you think?
SCOTT Take us just a second to go one more sweep there.
IRWIN Oh my poor old tong. Oh, I don't weigh that much up here, Dave, to break your tongs.
SCOTT I don't know what I'd do without them.
IRWIN Make sure we don't bury them.

END OF TAPE

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IRWIN Don't know what I'd do without them.
SCOTT So, don't bury them.
IRWIN Good, good, good. Kick anymore -
SCOTT Too bad, we didn't get many out of that. Why
don't you take one over - let me move the gnomon about
3 inches here and take one on this side, Jim.
IRWIN Okay.
SCOTT With the gnomon back about a foot. Why don't
you take a swath here and I'll -
IRWIN Yes, you know, cause we're moving further from
the rim. It gets less and less each swath. This one ought
to be a more fruitful one. Either that or my arms getting
tired.
SCOTT That's probably true too.
SCOTT How about a double core here, Joe. Got
any ideas on that one.
CAPCOM Dave, we're coming up on the departure time
about 10 minutes from now. All we really need is soil from
this same area. And we're making money hand over fist. Maybe
a few walnut sized rocks if there's some around.
SCOTT We got a whole bag full of those in the (garble).
And that's in 172.
CAPCOM Roger, copy. 172. I guess all we need is
a soil sample from this area. And perhaps even larger rocks
if there's some grapefruit to football size rocks there.
SCOTT Yeah, we'll just finish off Jim's collection
bag here. I want to stow it anyway. Oh, look at that glass
spherule down there. See that big one?
IRWIN Oh, yes. I see it.
SCOTT Why don't you back off and document the area.
Let me get my tongs and pick that up.
IRWIN Okay.
SCOTT Perfectly round - about -
IRWIN Here, let me help you. Get the tongs.
SCOTT Okay.
IRWIN Good, good. Keep your eye on the spherule.
SCOTT My toes are right on it. I got the tongs.
SCOTT My little paw. So I'll get you a bag and let
you take a picture of that. I'll get a bag and get the soil.
IRWIN Where are you going to put that little spherule?
SCOTT In the bag.
IRWIN Not with the soil though, are you?
SCOTT Yes.
IRWIN Okay.
SCOTT Came out of the soil. I just didn't want to
miss it.
SCOTT We'll remember that. It goes in bag number
173. Our friends in the back room are writing that down right
now.

CAPCOM How right you are, and we want to leave in about 5 minutes, and we still need the soil.

SCOTT It's coming right now.

CAPCOM Roger. We see it coming in.

SCOTT A little more?

IRWIN Yes, let's fill the bag.

SCOTT Is that a full bag?

IRWIN It's a full bag.

CAPCOM I want to see you shake that one down.

SCOTT Alright. Don't guess I will.

IRWIN Better have a 90 percent bag for sure to (garble).

SCOTT Okay, I think you need to reconfigure and we'll get ready to leave here.

IRWIN Okay.

SCOTT I'll go over and take this off then.

IRWIN Okay.

SCOTT Here, let me put this in your back pack. Stand there, that's good. I'll get it.

SCOTT I'm going to get a couple of big rocks, Jim. And then we'll just stow your bag and call it a day.

CAPCOM Sounds good, Dave. And we want to move in about 3 minutes. We're coming up against a hard stop here.

SCOTT Okay, 3 minutes.

IRWIN Okay, that doesn't really give us time to do much.

CAPCOM Maybe 1 big rock wouldn't hurt.

SCOTT Yeah.

SCOTT Jim.

IRWIN Yeah.

SCOTT Why don't you come over here and get your scoop and scoop me up 1 big rock.

IRWIN Okay.

SCOTT And get your camera on it cause I don't have any film. How about this one right here that looks like it has some layering in it.

IRWIN Yeah, that's the one I was talking about.

SCOTT Right there?

irwin Yes. You want to point to it?

SCOTT Yes, I've got my foot right there. Take a couple of cross suns real quick - - 7 feet cross suns.

SCOTT A little too far away old buddy.

IRWIN Okay.

SCOTT Okay, now come grab your scoop and we'll take it.

IRWIN It's a pretty big one to try and get with a scoop.

SCOTT Yes, you're right. I don't see anything else. A little fracture.

IRWIN Too big.

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SCOTT Too big. Get another one.
IRWIN Over here, Dave.
SCOTT Good boy. Get that one on your side.
IRWIN Okay.
SCOTT Atta boy. There.
SCOTT Should have left the rake on. Can you get
it? Good show.
IRWIN Easy does it.
SCOTT That's it, a couple more. Keep your balance.
SCOTT Can you get it up higher? Don't fall
backwards.
IRWIN I got it.
SCOTT Good. Okay.
IRWIN Fill that square.
SCOTT Okay, Jim. Let's get on the Rover and
head back.
IRWIN You haven't secured the rake there, yet.
SCOTT Okay. You secure the rake and I'll secure
the TV and we'll get moving.
CAPCOM Sounds good, Dave and Jim. And we want to
leave the TV camera where it is right now. It's stowed in
the proper position.
SCOTT Okay. Oh shucks.
IRWIN Not going to be room there is there?
SCOTT Not going to be room there is right. Any
place we can put your bag in your?
IRWIN Why don't you put that in one of those bags,
Dave.
SCOTT Yeah, I'm going to put it in a seat pan
now. Then, why don't you put your bag in here and come over
here. I'm going to put your bag in there. Your carrier is
awful loose and I don't want to lose that bag.
IRWIN What's in there, rock?
SCOTT I don't know what's in there.
CAPCOM And troops, how many big rocks did you pick
up - one?
IRWIN Think it's our - yeah 1 Joe. We're about
out of time here.
CAPCOM Roger. Although we're not hurting all that
bad, but we think you should be climbing aboard now. Looks
like you really put some weight on our suspension system when
you loaded it there.
IRWIN Wait till you feel this bag.
CAPCOM It'll weigh even more when you get it home.
And we're interested in getting you to move on out now, troops.
IRWIN Going as fast as we can, Joe. Right now.
CAPCOM Roger.
SCOTT Okay, Jim. Okay, you just want to stay in
FM TV, Joe?
CAPCOM Negative, Dave.

END OF TAPE

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SCOTT Okay, you just want to stay in FMTV, Joe?
CAPCOM Negative, Dave, go ahead and fill it. We just don't want you to move the television camera. It's in the proper position now. We want you to go ahead and stow the antenna.
SCOTT Understand. Okay. Here, let me get in first.
Keep doing PM 1 WB.
CAPCOM Roger, Dave and don't forget the ignition key.
SCOTT Yes, sir. Got it.
IRWIN Okay, the brush is going to be under my seat pan.
CAPCOM Standing by for your heading reading.
SCOTT Okay, standby, Joe.
IRWIN Are you going to give us an update, Joe?
CAPCOM What's the reading Jim? You probably won't need it.
IRWIN 290.
CAPCOM Torque it to 293, please, 293.
IRWIN Okay, understand 293. You want to torque it Dave? Yeah, go ahead and then you better get in so I can get your -
SCOTT (Garble) on.
IRWIN Uh uh, seat belt, get in. Okay, looks good. Where's your seat belt?
SCOTT I just put it down - didn't think I was going to use it.
IRWIN It's under there, Dave.
SCOTT I know it. I just can't get it. It's too bad, you can't get it high enough to use it. That's one of the problems - this scoop holds it way down.
IRWIN Can you get your feet in there?
SCOTT (Garble) Could you bring your left leg over, Jim? That's it.
SCOTT Okay, Joe, when we leave here I'm in a position to shoot the film.
CAPCOM Beautiful.
SCOTT We'll get some down hill motion here. Okay, there we go. Did you torque it, Jim?
IRWIN No, I didn't.
SCOTT Yes or no.
IRWIN No.
SCOTT Okay.
IRWIN I could get it now if you like.
SCOTT Yeah, get it, okay?
CAPCOM Rover, this is Houston.
SCOTT SK293.
SCOTT Go ahead, Houston.
CAPCOM Now Dave we want you to head toward station 4 and we'll advise you on what your rate looks like and the

CAPCOM task that we want you to carry out once you arrive. Just start off in the direction of station 4, please.

IRWIN Dave, give me a heading.

IRWIN I could see it over there, Dave, yeah. I see about 330. That's not going to mean much to you until you get down to the level.

SCOTT That's right, and the camera is running, Joe.

CAPCOM Okay, and standing by for a mark when you roll.

SCOTT Roger.

IRWIN Hey you (garble). Camera is sort of swivel, Jim.

IRWIN I'm getting a beautiful pan here.

SCOTT Oh, really. That's an awful fast pan.

IRWIN I just wanted to make sure it was running.

CAPCOM Dave you'll want a trend for course 346 and it's about 1.7 clicks to station 4.

SCOTT Okay, I'm going to go down sort of slow here, Joe. Make sure we play it cool.

CAPCOM Sounds reasonable.

CAPCOM And Jim, when you finish photography we're standing by for a description.

IRWIN Well, I just left the camera running Joe, remind me to turn it off when it runs out of film.

CAPCOM Yes sir, I've got a hack.

SCOTT About half a mag on it.

CAPCOM Roger and you're running at 12 frames per second I imagine.

IRWIN Yeah, right. We're going down sun.

SCOTT Down sun isn't going to be very good on the photography, Joe. The zero phase just washes out completely.

CAPCOM No problem Dave. Jim might want to swing the camera around and point it more towards the right.

IRWIN Well, we're heading directly downhill now, we're cross sun.

CAPCOM Okay.

IRWIN Yeah, I'm looking on at the - are we looking at the big crater dead ahead.

SCOTT Yeah. (garble)

IRWIN You want to hit the southern traverse?

SCOTT Yeah. But again that's - you know, we didn't see the levee or ramp part on eastern side.

IRWIN No. We sure didn't.

SCOTT So, probably any place on the southern rim would be good. Although from here it almost looked like you could drive around the eastern rim of Dune. Boy there is a crater just east of Dune that looks very recent and it has a great number of blocks that I can see from here. and the

SCOTT largest from this vantage point again ya'll have probably seen it on TV. The largest crater which was Arrowhead, we named Arrowhead, really runs east-west which we mentioned before, rather than north-south and on the northern side of a large crater - elongate crater which runs north, east west, on north side there are a great number of rocks exposed.

CAPCOM Roger, we copy.

IRWIN Tracks here as we go down slope. Rover tracks.

SCOTT Probably just follow the tracks, huh.

IRWIN Yeah, probably you do.

CAPCOM Sounds good.

SCOTT We know that's a fairly good run.

IRWIN Yeah. Okay, we're hitting 320, bearing 350 and range is 4.3.

CAPCOM Copied, Jim. Thank you.

SCOTT Sure is - it's bouncier going down isn't it?

IRWIN Yeah.

IRWIN And we're about down out of it now.

What a beautiful site. Man!

SCOTT Well we didn't get the 500 in stereo up there, but you got a pan, didn't you?

IRWIN Yeah.

SCOTT Okay.

IRWIN I can't get over those lineations that layering at Mount Hadley.

SCOTT Boy, I can't either. That's really spectacular.

IRWIN They sure looked beautiful.

SCOTT Talk about organization. Yes man.

IRWIN That's the most organized mountain I've ever seen.

SCOTT Yeah, and it is so uniform in width.

IRWIN Nothing we've seen before has had the same I think that's in each bed, uniform thickness from the very top to the bottom.

SCOTT And looking to the north on that Spur that we talked about yesterday we can see the horizontal bed again.

CAPCOM Roger, Jim. Copy. Any idea of the dimension on that thickness?

SCOTT Actually I'd estimate it's relatively thin but yeah, I'd say it's probably - if you took the ridge line on Mount Hadley which is practically horizontal at our present position and put that into a hundred percent I'd say those lineations across there - the bedding across there are probably like a quarter of a percent, wouldn't you, Jim?

IRWIN Yeah, certainly less than one. Yeah, specially -

END OF TAPE

SCOTT radiations across there, the bedding across there are probably like a quarter of a percent wouldn't you Jim.

IRWIN Certainly less than 1.

SCOTT Yea. Must be, if you look across the ridge line and then look at the dip to the northwest there, you can count a couple of a hundred any way couldn't you.

IRWIN Yea.

CAPCOM Amazing.

IRWIN Apparently you couldn't see that on TV.

CAPCOM No, not at all, not at all. Hopefully it's in the photographs. We're marking it down on the list. That TV isn't everything.

SCOTT And then if you look, yea, Jim horizontal half, well all the way up, I guess that would be slumping.

IRWIN Yea, there is. I see it now, yea.

SCOTT It just looks like slump probably.

IRWIN Yea.

SCOTT Cause it's continuous subhorizontal lines, which are pretty much cross bedded, if it was bedding and I don't think it is. It just looks like slump pattern ground.

CAPCOM And what kind of progress are you making now Jim.

IRWIN Oh, we're going at about .8 clicks.

SCOTT No, no. Eight.

CAPCOM Roger, copy Dave.

SCOTT That's almost backing up.

IRWIN And we're heading 340 bearing 349 range 3.9. And we're going up a slight slope. Following our tracks.

CAPCOM Roger, copying every word Jim. Keep talking.

SCOTT Okay, here's that little tilt. Hang on. Easy does it. Okay.

IRWIN There's the LM directly ahead of us.

Yea. Bearing is right on, right on the money.

SCOTT Yea, that's quite a NAV system.

Quite a system system.

IRWIN Now we're going 11 clicks.

CAPCOM Roger Jim, copy. And are you progressing towards Dune crater now?

IRWIN Yes. Well we're following our tracks. We thought when we got up here just south of Dune, we'd probably head north northeast.

IRWIN Big boulder on the surface. It's about a foot.

CAPCOM Okay Jim. Copy that and just a factor into your thinking, we can afford a very short stop in the vicinity of station 4. It doesn't have to be really very close. We're interested in either documented samples or rake samples there if you think it looks like a good area for rake sample.

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IRWIN Okay understand Joe. Would you still like the station to be on the southern rim I would think.

SCOTT Sure.

CAPCOM Probably down wind from Aristillus or Autolykus Jim, but the exact positions certainly not critical. Your judgment.

IRWIN Okay.

SCOTT Okay, we'll go get some.

IRWIN Let's see about a 12 o'clock position ought to be a good sampling station.

SCOTT Yea, I think your right.

IRWIN Okay, we're heading off now at 025 heading directly towards the southern rim of Dune.

CAPCOM Rover, this is Houston.

SCOTT Go ahead.

CAPCOM Roger. The mag's run out on your camera Jim. You should shut that off and we don't want you to stray too far from you rover tracks. Head back more or less the way you came. We have time for about a 10 minute stop some place south and perhaps a little west of Dune crater. Over.

IRWIN Rog, Joe. We'll do that. We're just on the rim of Dune right now.

CAPCOM Okay and Jimmy. Did you turn the camera off?

IRWIN I did Joe, but apparently it didn't run past. I still have about 40, 45 percent left.

CAPCOM Okay Jim. Fine.

IRWIN Joe, I have turned it off.

SCOTT This is a good spot here.

IRWIN Boy, look at those large blocks on that west wall.

SCOTT Hey look at the large one right here. Gee let me get this on.

CAPCOM Standing by for you mark when you stop and either Dave or Jim, we're going to need you, our camera and LCRU and the camera lens brushed off before you continue.

SCOTT Okay.

IRWIN Okay, we've stopped Joe.

CAPCOM Roger, mark that.

IRWIN 292 292 347 8.9 3.4 94 100 89 90 motor temps both low.

CAPCOM Okay beautiful.

SCOTT Okay, LCRU is cleaned off Joe.

CAPCOM Okay Dave. And if you think you can make this a 10 minute stop, we'll forgo the TV. We're interrested in keeping it pretty short.

SCOTT Let's forgo the TV Joe.

CAPCOM Okay. And a rake might be useful here, but once again your choice on getting us a few samples.

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IRWIN For a 10 minute stop Dave, I don't think
the rake is -

SCOTT No.

IRWIN very good.

CAPCOM Just depending on how ever you read the
fragement distrubution.

SCOTT Yea.

IRWIN There are a lot of large fragements here
Joe.

SCOTT Jim, I've got to change my film mag right
here.

IRWIN Okay, I'll take a pan.

SCOTT Take a pan yea, good idea.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/1/71, 11:06CDT, 146:33GET, 434/1

SCOTT Jimmy.
IRWN Camera's stopped working.
SCOTT It has. Maybe you're out of film.
IRWIN I just put this on.
CAPCOM Is it your camera, Dave?
IRWIN Get the pictures; let's fill up the sample.
SCOTT Jim's out of film; or his camera's stopped
and I can take the pictures.
CAPCOM Dave, did you change your mag out at the
last stop? Yeah, I guess you did. Beautiful! Press on.
SCOTT Jim, let's get down here by these boulders.
IRWIN Okay.
SCOTT I think we can get a pretty good distribution.
IRWIN Joe, I have a partial pan there and my camera
stopped working.
CAPCOM Okay, Jim. No problem.
SCOTT These two right here, Jim.
IRWIN Okay, you've got to take the pictures.
SCOTT Yeah, I'll take all the pictures, if you'll
get the - uh -
SCOTT Fill the bag up?
IRWIN Yeah.
SCOTT Yeah, we'll need another one.
IRWIN Okay.
SCOTT Get a bag and you get some soil here.
Watch that big one. I want to get that one, too.
IRWIN If you want it you - -
SCOTT You zip the bag and let me get that other
big rock - location.
CAPCOM Go ahead flight.
IRWIN Got your bag.
SCOTT I - I didn't notice - oh, yeah. It must
be - what number was that, you remember?
IRWIN No, I don't.
SCOTT Okay, hold this bag and it's number 174.
CAPCOM Okay, Dave, copy that. 174.
SCOTT And there's one before that that came
off Jim's bag rack.
CAPCOM Rog. And was that an empty one.
IRWIN Read the number on my bag.
SCOTT Joe, just - we'll get to you.
CAPCOM Okay.
SCOTT There's 204 in there now. It must have
been 203. Okay, back up a little bit Jim so I can get the
picture. That a boy. Okay. Put that in my pack, just
going to get a couple more.
IRWIN The large gray one to your right with
large vesicles in it.
SCOTT Yeah, that big boulder. Yeah man.
IRWIN Yeah. Okay. (garble)
SCOTT Get to it.

APOLLO 15 MISSION COMMENTARY, 8/1/71, 11:06CDT, 146:33GET, 434/2

IRWIN Huge vesicles.
SCOTT Oh, look at the plagioclase in there.
Man look at the glass, Jim, it's beautiful. Whooo! Vesicles
in this must be about 2 to 3 inches.
CAPCOM Oh, yes.
SCOTT And it's a big boulder.
CAPCOM Okay, Dave, we're going to have to sack
that one up and think about moving on.
SCOTT Yes sir.
IRWIN Boy, that's a real beauty.
SCOTT Sure is, isn't it?
IRWIN You want to try and knock a piece off, here?
SCOTT Yeah. Should come off pretty easy. Sure
looks great.
SCOTT Get all these.
SCOTT Okay, if you'll hold my tongs here.
SCOTT Okay, should be with you right here in the
middle.
IRWIN These?
SCOTT Yeah.
SCOTT (garble)
IRWIN Okay, that's enough Dave.
SCOTT I think you're right.
CAPCOM And we think you're right.
SCOTT Okay, good show. Good shape. Take it
easy.
IRWIN Now put that large one in my pack.
SCOTT Yeah. Oh, shoot. You dropped your pack.
Fortunately, it wasn't the one with the rocks in it.
IRWIN Yeah. How about that?
SCOTT I don't know what it had in it, but it
sure didn't have those good rocks in it and that's why I
put those good rocks in the - Oh well, win a few, lose a few.
IRWIN Take a look down.
SCOTT Put that in my pack, will you Jim?
SCOTT It isn't the large corner of a vesicular
rock, that's the big boulder sitting here.
IRWIN That's just about all we're going to be able
to put in your bag.
SCOTT Is that right?
IRWIN Yeah, it's just about filled.
SCOTT Okay. Hey, maybe - let me get those two
frags there from the center. Give me my tongs.
IRWIN Yeah.
SCOTT Now, you get you out a bag.
CAPCOM Okay, Dave and this should be the last one.
We want to head em up and point em out.
SCOTT Okay. Head em up and point em out. 204.
SCOTT Wait, let me get the other one.

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SCOTT Two frags from the center of the - -
IRWIN No, that's - that's not it.
SCOTT It's not.
IRWIN No.
SCOTT Where is it?
IRWIN Down there, right there. That's it.
SCOTT 204 for the two frags in the center of the
boulder. And the big chip off the top that's got the vesicles
in it is in my pack (garble).
CAPCOM Roger.
SCOTT And that's not much for Dune but I
think it's `representative.
CAPCOM Okay, we're ready to roll.
IRWIN Okay. Put that in my bag.
SCOTT Yeah.
IRWIN Done.
CAPCOM And Rover, you should be able to easily
follow your tracks back home.
SCOTT Sure. I'm sure we can Joe.
SCOTT Hey, Jim, head back to Rover.
IRWIN Okay.
IRWIN Boy, underneath that one is another one
with larger vesicles in it.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 146:42 CDT 11:16 435/1

CAPCOM Dave and Jim, as you climb back on, we'd like an EMU status check from both of you, please.

IRWIN Okay, I'm reading pressure 385, flags are clear and 50 percent.

SCOTT Hey, dust off a little bit over here. I'm reading 42 percent, 3.9 and dust off - flags are clear.

CAPCOM Sounds good.

SCOTT Jim, do you have a seatbelt?

SCOTT Easy, easy, easy.

CAPCOM Jim, when you get settled, you can check the camera on 12 frames per second and turn it on again please.

IRWIN Yeah, I don't know why it didn't come on last time, Joe.

CAPCOM Okay, check it at 12 frames per second, please.

IRWIN Yes. Sit back if you can now.

SCOTT Can you hold these things for me, Jim?
Hold those too.

SCOTT No, I didn't put a bag on you did I? That's right. We're okay.

IRWIN What did you do with that bag?

SCOTT Stuck it on the hand tool carrier so -

IRWIN That's right - okay. Boy you had me worried.

SCOTT Had me worried, too. I knew the one with the good rocks, I hadn't lost cause I stuck that in the seat pad, but I thought I'd put one on your - Now I remember, I started to put it on you and your harness looked loose so I stuck it on the hand tool carrier where it's got a lock so we're okay.

CAPCOM And we knew all the time, Dave. We should have told you. Wanted to keep you honest, though.

SCOTT Right, Joe. Keeps us honest.

SCOTT Okay, it looks like the camera is working, Joe.

IRWIN It's just hard to press that in all the way.

IRWIN We'll try it again on our drive back.

CAPCOM Okay, Jim. Sounds good. We'll be standing by for your mark.

IRWIN Okay, I'm on.

SCOTT (Garble) the seatbelt.

IRWIN Okay, seatbelts fastened. Right in there.

SCOTT Okay, Joe. Mark. We're rolling.

CAPCOM Beautiful Davey, beautiful. And some more words about your next assignments coming up here. Dave, we want you to drop Jim at the LM and I'll talk to him in a minute. And then you go on over park near ALSEP headed west.

SCOTT Okay, understand, Joe.

IRWIN Sure are a lot of neat rocks in the Dune. Too bad we can't spend some more time.

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CAPCOM On your next trip.
IRWIN Yes, next trip, you're right.
CAPCOM And Jim, you might want to start the camera.
IRWIN Yeah, it's running, Joe.
SCOTT Think we can get through up here? Seems to me
we could.
IRWIN I think you should be able to. Maybe a
little to the right.
SCOTT Yes, I'll come right now. Past this little bump.
SCOTT And we're in a little boulder field. And
about a foot at the biggest down to about 6 inches.
IRWIN Yes, it looks like a crater that hit on the
rim of Dune.
SCOTT Yes, it sure does.
IRWIN Yes, we're reading a bearing of 350 range 3.3.
SCOTT Okay, and we're on our tracks.
CAPCOM Roger. And follow them home.
IRWIN Okay.
SCOTT Gee it's nice to sit down isn't it?
IRWIN Oh, it is.
SCOTT It's a good deal. You hop off and work like
mad for 10 minutes and hop back down and hop on, sit down and
take a break..
IRWIN I guess in a couple of craters we remarked that
we saw, a boulder distribution that looked like it was linear,
like it was a ray pattern.
SCOTT Yeah.
IRWIN But we never did get a chance to sample any of
those. As I recall, there was 1 on the - we saw one on the
south side of the Dune-way down.
SCOTT Yes.
IRWIN We could probably save some time going back
by not following the tracks you know, cause we can see the LM.
SCOTT Right. I think we ought to head right straight
ahead on. We can see home.
IRWIN The only big one over there - big crater over
there would probably be Earthlight. I think that's probably
Earthlight that we see at 12 o'clock.
SCOTT Yes.
IRWIN If we stay west of Earthlight, we ought to
save a little distance.
SCOTT Yes, lets get out of this little boulder
field first. Okay, now we'll take a little left here. We
can look at Pluton. We'll see Pluton all the way. And the
LM is silhouetted right against the base of Pluton so we
can't miss that. And just to the right of it is Sharp Rille,
which we'll be heading for tomorrow. By the way, Joe. I
guess we ought to tell you about what we saw at that last
stop. We gathered a few quick samples that were covered with

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SCOTT dust, which we didn't look at very carefully, just so we could get ahold of them. Then the very large boulder, which was probably about 6 feet, sticking up out of the ground with a very large 3 to 4 inch vesicle with a very fine grained dark black basalt, with maybe - gee I'd say 15 percent (garble) in it wouldn't you Jim?

IRWIN Yes, very fine (garble)

SCOTT Yes, a very fine (garble) and on the top it had some smaller millimeter size vesicles and adjacent to it was another lighter grey basicular basalt, which was uniform in basicularity in which we didn't have time to sample, that the vesicles in that looked similar to that 1 rock that we got yesterday, Jim - the rounded one. Remember it was in the bag alone. Anyway, these vesicles were gee I'd say, 4 millimeters to - some of them were a centimeter all the way through it. And the 2 rocks seemed to be in contact with each other. Unfortunately, we didn't have time to sample the second one, but we did get a fairly good sample of the corner of the first one and the central part near one of the vesicles.

CAPCOM Roger, Dave. Beautiful description. And Jim, you might stop the camera now. It's probably run through the film load and we'd like clicks and amps readings please.

IRWIN Okay, we're doing - the camera is empty - Joe we got some coverage there. And we're going at about 10 clicks, amps reads about 10.

CAPCOM Okay, sounds good.

IRWIN That might be Earthlight up ahead, Dave.

SCOTT Yes, I think you're right.

END OF TAPE

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SCOTT About 10.
CAPCOM Okay, sounds good.
IRWIN That might be Earthlight ahead, Dave.
SCOTT I think you're right. I guess we'd better go
east of it.
IRWIN Yeah.
IRWIN One might end up on our tracks.
SCOTT Yeah. I don't know. I think we'll pick it up.
SCOTT (garble) is pretty good, you know.
IRWIN Yeah.
SCOTT Visibility-wise.
IRWIN Then coming down this morning, I guess
we -- we looked over at Earthlight, didn't we?
SCOTT Yeah.
IRWIN Commented on the southern ream of it.
SCOTT Yeah, we're in good shape now. A straight shot.
SCOTT See the old LM sitting out there? Starting
making out detail on it.
SCOTT Range 2.4.
SCOTT I think we're closer than that.
IRWIN I'll see how it checks out when we get there.
SCOTT Yeah.
CAPCOM Jim, I've got some words for your next task
when you arrive at the LM if you're ready.
IRWIN Go ahead, Joe.
CAPCOM Roger. For both of you now, Dave, we want
you to stop at the LM and you'll have to offload your col-
lection bags and get configured for the next part of the
EVA. Jim, we want you to run a mal procedure on your camera.
If you can't get that MAG to work, put on MAG KILO KILO and
then your first job will be the LM site pans and then photo-
graphs of the descent engine and photographs of the solar wind
composition experiment -- the window shade. Those three sets of
photographs. Do you copy?
IRWIN Yes. I understand, Joe.
CAPCOM Okay.
CAPCOM And Dave and Jim. I'll talk you through
the reconfiguration of the equipment when you're ready for it.
I think we have a good handle on it down here.
SCOTT Joe, why don't you wait till we get to the
rover? Cause it'll just slip right through us right now.
CAPCOM Roger, Dave. That's exactly the plan. I'll
be standing by and when it's time, I just talk you through it.
SCOTT Okay. That's just fine.
IRWIN As far as Dave's bag, Joe, I forget the
number on it, but I'll just take out -- the core tubes that we
have not used and then it will be ready to go in SRC2, is that
correct?
CAPCOM It sounds good.
IRWIN Do you agree with that as far as Dave's bag --

CAPCOM That -- that agrees, we think, Jim. We'll think it over once again here.

IRWIN Okay.

IRWIN Think you can get through there, Dave?

SCOTT No. I'm going around to the right. Just missed this boulder here. There's a directional (garble).

IRWIN It sure is.

SCOTT Look at that. It's right straight out one sided. It would be a good place to take a radial sample. That thing came in from -- let's see -- we'll be going.

IRWIN Yeah, we're going north --

SCOTT Yeah, we're going north and the and the injectrapattern is spread out due west about 20 meters across and it must go out a good 150 meters or so.

IRWIN To the east, right?

SCOTT Yeah.

SCOTT And our bearing is 347 and our range 2.0. at that point.

CAPCOM Roger.

SCOTT Some of those babies sneak up on you.

IRWIN This time we ought to get the covers up in the cabin, Dave.

SCOTT Get the what?

IRWIN The covers -- you know, the bull durham sacks.

SCOTT Yeah, I know it.

IRWIN We'll go around to the right.

SCOTT Yeah, I guess we'd better.

CAPCOM Hello, Rover, this is Houston.

SCOTT Go ahead, Houston, Rover, here.

CAPCOM Roger, Dave, be advised that the ALSEP is picking up the rumble and the rover rolling across the plains.

SCOTT Is that right? How about that.

CAPCOM And according to our data, you're heading right for the LM.

SCOTT You can give us a DF from the seismometer.

CAPCOM Roger. Stand by for practice DF steer.

SCOTT Yeah, man. I think this is INDEX, Jim.

IRWIN The one on our left, Dave?

SCOTT Yeah.

SCOTT In fact, I'm pretty sure it's index.

SCOTT It's got the nice side crater in the north.

IRWIN I thought INDEX had a larger crater than the one on the north side.

SCOTT Well, I don't know how large large is anymore.

IRWIN I give up that on distances and sizes.

SCOTT 01.7.

CAPCOM It's probably arbeit.

IRWIN It couldn't be itthen.

SCOTT I don't think so. Arbeit, yea, yea, that's right, that's right, we came by that before. We might as well just - get on those tracks and we know we're straight.

IRWIN Notice that, that crater.

SCOTT Yea, at 12:30 tons now.

IRWIN Here's a fresh one.

SCOTT It's fresh and has a very light albedo.

IRWIN That's November.

SCOTT Got to be November.

IRWIN That's really November Crater.

SCOTT We're heading 360, the bearings 340 and the range 1.5.

CAPCOM We copy that.

IRWIN Pointing right at November at the time.

So, Index is over there on the right. I'm going to be seasick.

CAPCOM What do you expect traveling on the mare.

SCOTT See that one right there.

IRWIN Aren't we just about.

SCOTT Yea. Pretty good machine, isn't it?

IRWIN Sure is.

SCOTT Couldn't ask for better.

IRWIN And we're going 12 clicks.

CAPCOM And it's a new outdoor record.

IRWIN Talk about dusty. Whew!

SCOTT Yea, bo.

IRWIN It sure doesn't kick up as much as I thought it would.

SCOTT No, you know, even if you had rubber tires on here, I think it'd kick up the same amount of dust.

IRWIN Yea, (garbled). And you sure wouldn't climb that hill like we did.

IRWIN Notice that white colored rock there that we just went over.

SCOTT Yea, over, uh huh.

IRWIN We're still going at 12 clicks?

SCOTT Heading 340.

CAPCOM Roger, copy, Jim, and I'm wondering if you caught sight of the small crater you saw outbound, which you described as having bedrock in the bottom?

IRWIN Haven't. Don't think we've come that far yet.

CAPCOM Okay.

SCOTT I don't either. Why, are you contemplating a stop there?

CAPCOM Negative. Just curious.

SCOTT Yea, I see it dead-a.

CAPCOM We are interested in a Nav reading there, an odometer reading and we're going to measure how far away that is from the LM.

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SCOTT Okay.

CAPCOM Can use that Rover for everything.

SCOTT Yea man. Sure can.

IRWIN Looks like November has a lot of blocks,
too, but I can't see any - I thought the crater that looked
like it had bedrock was off to the east of our tracks.

SCOTT It is, over here to our 11 o'clock. I mean,
no, no, I'm sorry, your're right. I was thinking of a
different one, Jim.

END OF TAPE

SCOTT (garble)
IRWIN I thought the crater that looked like it had bedrock was off to the east of our tracks.
SCOTT It is. Over here to our 11 o'clock.
I mean, no no, I'm sorry, you're right. I was thinking of a different one, Jim. November has a raised rim which is I think unique around here.
IRWIN Kind of a large rock to the north of November.
SCOTT Yea.
IRWIN It looks like it's half buried. This is fresh crater that we're coming up ahead. I know we've, we talked about it but I don't know whether it had, whether there was any bedrock.
SCOTT We'll see when we get there.
IRWIN Yea.
IRWIN (Garble) having a bit to eat.
SCOTT Sounds good. Yea, I think this is the one we culled, isn't it, Jim?
IRWIN Looks like an esculated bedrock.
SCOTT There are frags on the side. It's got a light albedo which are obviously fresh. I think this is the one, isn't it?
IRWIN Well, we'll give it to them anyway.
352 for .7.
CAPCOM Roger copy. Thank you.
IRWIN Alright. Okay.
CAPCOM Dave and Jim, a comment about your equipment off load. The off loading should go exactly as if it were at the end of EVA 1 with regards to transferring 4 tubes and so forth only the collection bag numbers will be different. And we'll try to talk you through that.
IRWIN Yea, you'd better.
SCOTT I just didn't see that crater that I -
IRWIN That wasn't the one, Dave.
SCOTT Don't think so.
IRWIN No, cause it was one, it was to the east of us and I look down and saw a layer of bedrock about a quarter of the way up on the wall.
CAPCOM Okay Jim. Give us another odometer reading.
IRWIN No, I haven't see it.
CAPCOM Okay. Whenever you pick it up.
IRWIN See it on the way back.
CAPCOM Okay, no problems.
IRWIN To the LM. The freshest one was the one that Dave just gave you, gave you the co-ordinates on.
CAPCOM Roger.
IRWIN Unless this might have been the one.

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SCOTT Where?
IRWIN Right here. (garble)
SCOTT No.
IRWIN That wasn't the one, too large.
SCOTT The antenna drifted.
IRWIN Yea, I wonder if that's the best position for thermol.
IRWIN Pull that antenna I'm looking at the LM antenna.
SCOTT Oh yea, the radar antenna's pointing straight up.
IRWIN If it is, that's the light side.
SCOTT Yea. We've got tracks upon tracks, Jim.
IRWIN Yea, it looks like a thoroughfare, it looks like a freeway.
SCOTT Yea, okay. We'll take this fork here.
CAPCOM And Dave as you know the only thing we have to worry about especially with regard to kicking dirt, the solar wind composition experiment and the LRT which is pretty far away.
SCOTT Okay, we'll be careful.
CAPCOM And we'll mark when you stop.
IRWIN Rog, we're almost there. Home sweet home.
SCOTT Okay Jim, I'm going to drop you off right here.
IRWIN Okay.
SCOTT Okay Joe. Run throught what you want to do now.
CAPCOM Okay, the first thing I guess is to off load the gear as if you were out at the ALSEP sight with regard to transferring cores, etc. And we mark you stopped.
SCOTT Yes, I can get off too.
IRWIN Okay.
CAPCOM And Jim, standing by for your LRV readouts if you're still there.
IRWIN Yea, I am Joe. I'm reading 004018 12.5 002 91 98 92 98 and motor counts are low.
CAPCOM Roger, thank you.
CAPCOM Jim, are you climbing off the rover now?
IRWIN Okay, yea, we're climbing off. Let me ask you a question now, Joe, what you say, you want us to, to figure now like we would at the ALSEP sight.
CAPCOM Dave, basically you just want to unload the collection bags that you're carrying. We want to wind up with collection bag number 2 on the hand tool carrier and number 3 under Jim's seat. In addition to that we want number 5 on the hand tool carrier.
SCOTT 2 and 5 in the hand tool carrier, okay.

CAPCOM Rog, and 2 is under Jim's seat right now. We want to trade that out for number 3 going under the seat.

IRWIN Okay, I'm wondering if we should take our tools off.

IRWIN We might as well take our tools off, right Dave.

CAPCOM Jim, roger, take your tools off, and we're going to ask you to deploy the flag a little later and you probably will need the hammer for that.

IRWIN No, I won't need the hammer.

CAPCOM Okay.

IRWIN Out here. I can't get that mag to operate, Joe. I manually advanced it. It just won't kick over.

CAPCOM Okay, we copy that Jim. Put on mag kilo, kilo on that camera please.

IRWIN I was wondering, is Dave going to need his camera out there?

SCOTT No, why don't you take mine. Mine happens to have kilo on it.

IRWIN Yea.

CAPCOM Boy that's an outstanding idea.

SCOTT That goes, but I've got 2 on.

IRWIN Okay, bag 7, see this is EVA 3 bag here.

CAPCOM Roger, bag number 2 should be under that seat as well.

IRWIN Joe, we know - let's see you want 2 and 5 on the hand tool carrier, and the rest under the seat, is that correct?

CAPCOM That's correct.

IRWIN Okay, stand by.

CAPCOM And Dave, we do want you to unload the tools, put them back on handtool carrier, we'll need them later at the ALSEP sight perhaps.

SCOTT Rog, Joe.

IRWIN Bend over a little, Dave.

SCOTT Okay.

END OF TAPE

CAPCOM Flip them back on the hand tool carrier and we'll need them later at the ALSEP site, perhaps.

SCOTT Rog, Joe, (garble) okay. I'd like to take this little cargo hear and take it right over to the mesa.

IRWIN What bag number is it?

SCOTT Well, that's the bag that goes in bag 5. Bag 5 goes in the SRC. Jim, just let me take out the unused core tubes. Joe, speak up now if there is anything else you want put in bag 5. I'm going to take it over to the mesa. Yeah, there is no sense in putting bag 5 on the hand tool carrier, Joe, because it's just about full. Why don't we put it on the mesa or in the SRC or something.

IRWIN Dave, when you take your camera off just leave it on my seat.

CAPCOM Dave, the only problem is if we're able to get the deep samples using the drill stems we'd like them in the SRC. I guess we'll leave it up to you. Your choice. We - may be better just to take bag 5 over there right now and forego that little nicety.

SCOTT Well, Joe you didn't, just a minute Jim, just a minute, no, Joe you didn't say anything about getting deep cores. You - that's why here let's take 3 and put it over there, keep it there. Let me take 2 back because now that I know that they want to try and get the deep cores we do need bag 2.

IRWIN Yeah, that's the first time anybody said anything about that. That's bag 5 Dave, I mean 5 (garble). Well, Dave, why not leave 5 in. Did you get the cores bring them back, and we'll put them in there, i just won't put them in the SRC. We'll hold the SRC open.

SCOTT Yeah, that's right.

IRWIN I'll hold it open.

SCOTT Okay.

CAPCOM Sounds good Jimmy.

SCOTT Hey, Jim I'm going to leave you my camera right here, on the mesa, huh?

IRWIN No, just hand it to me now. I'll take it right here.

IRWIN Okay, I'll put it on.

SCOTT Here you go.

IRWIN Let me read it.

SCOTT Yeah, let me read the numbers on it first. Of course, it's not on all the way but it's reading 89.

IRWIN Get that, Joe, my camera 89?

CAPCOM Got it Dave, thank you.

IRWIN Dave, you're hung up on that strap.

SCOTT Okay, thanks Jim.

IRWIN Okay, now.

SCOTT Listen why don't you take my tools off.

IRWIN Yeah that's a good idea.

IRWIN Let's get cleaned up, here.
SCOTT I think we only have two bags to go, go up
this time.
IRWIN Yes, here's a hip.
IRWIN Okay, here's the rammer.
SCOTT Okay.
IRWIN Core tube capped.
SCOTT Okay, tie up your velcro.
IRWIN Okay. Check yours again, Dave. I don't
recall that I tidied yours.
SCOTT Okay, when you get in your right side is loose.
So be careful.
IRWIN Okay.
IRWIN Okay your tight.
SCOTT Okay, right side okay.
IRWIN Yes.
SCOTT Yes. Okay.
IRWIN Put these core tube caps under the seat,
got more core tube caps now we know what to do with.
SCOTT Those rocks that are under the seat. I'll put
those in the bags - well that bag that's under there before
you drive off.
IRWIN There isn't any bag under there now. I got it
right here seven.
SCOTT No, here's a bag right here. Right or is that
(Garble).
IRWIN Okay, here's a bag here six. You're going to
use that one out there, right?
SCOTT I don't know, where do you want bag seven, Joe?
CAPCOM Bag seven stays there, Dave. Leave it there.
SCOTT Where's there.
CAPCOM Is it under the seat. I think it's under the
seat and I think it's the bag for the next EVA, keep it there.
SCOTT Okay, it is I think it is.
IRWIN Yes, that's one for the next EVA.
SCOTT Okay, it's under the seat.
IRWIN I was going to get those rocks and put it in
this bag.
SCOTT Bag six.
IRWIN Okay.
SCOTT Can you get the bag.
IRWIN Yep.
SCOTT My arms are a little longer maybe I can reach
it, Jim.
IRWIN That a boy.
SCOTT Okay. I don't want to leave any rocks there.
IRWIN You're right. Okay.
SCOTT Is that the only one or do we have another one.
IRWIN It's the only one.
SCOTT Put A under your seat, huh.
IRWIN Oh yes, thank you. I did.
SCOTT Great.
IRWIN I'll just hold up on the SRC closing until - -

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SCOTT Yes, decide what you're going to do out there.
CAPCOM Sounds good, Jim.
IRWIN Zero probably I'll put it in here.
SCOTT Yep.
CAPCOM Sounds good, and Jim, while you're working there once again we want you to get your LM site pans pictures of the descent engine and solar wind composition pictures and then I'll be back at you with the next job. And Dave standing by for when you're ready I'll talk about your task coming up, here.
SCOTT Okay, Joe. Are you through with the hand tool carrier, Jim?
IRWIN Yes, I am Dave.
SCOTT Okay.
IRWIN Tidy up the rover.
IRWIN Okay, Joe back at the - on the mesa I have bags 5, 6, - 3, 5, and 6.
CAPCOM Roger, copy Jim. We'll get them later.
SCOTT And Joe, I'm on the rover and ready to go.
CAPCOM Okay, Dave. We want you to park east of the ALSEP heading towards the west and as far east as is comfortable for you. Once again with the dust problem in mind. And we want you to clean the TV camera and LCRU before you leave the rover.
SCOTT Okay. Park east heading west and I'll just get it fairly close to the central station and avoid the dust. How does that sound.
CAPCOM Roger, just don't drive too far west. Keep it east if you could please.
SCOTT Okay. Incidentally if the rover bearing was 018 and range .2. That's pretty good for a trip like that.
CAPCOM Ain't it though.
CAPCOM And, Dave as you climb off there and get the TV set and are ready I'll talk to you about the next drilling job.
SCOTT Alrightie.
SCOTT Okay, I'm going to park right here. And if you get bored there's a big chunk of dark green (Garble) with white clast right in front of the left wheel. Have fun looking at that maybe.
CAPCOM Okay, Dave. We know your not too close to the - -

END OF TAPE

SCOTT front of the left wheel, have fun looking at that maybe.

CAPCOM Okay, Dave, we know you are not too close to the heat flow experiment hose now. We do want you to be particularly aware of the side which has had its dust cover pulled off of it too, so it'll be particularly sensitive to dust. When you are ready, once again, I've got words on how this drill should work.

SCOTT Okay, first you want me to dust off your TV, is that right?

CAPCOM Yes Sir, please. And the LCRU.

SCOTT All right, you broke up Joe.

CAPCOM Roger, Dave, dust off the TV and the LCRU, please.

SCOTT Rog, TV, I understand that, but do you want the TV lens, cause we have a mirror we can dust off and we also have a lens we can dust off.

CAPCOM Yes sir, both the camera and the lens, please.

SCOTT All righty, it takes a couple different brushes, I hate to put this big brush on the lens.

CAPCOM You read it correctly.

SCOTT There your eye is all cleaned off.

CAPCOM Okay, Dave, we're standing by for TV turn on.

SCOTT Okay, brush back in its proper place. And I'll go TV remote, and I'll try and point up the antenna, and a very good position, (garble)

SCOTT Are you getting any picture yet, Joe?

CAPCOM Say again, Dave.

SCOTT Do - are you getting any picture yet, Joe?

CAPCOM Say again, Dave.

SCOTT Are you getting any picture yet?

CAPCOM Beautiful picture.

SCOTT You clipped on the front, I didn't hear what you said.

CAPCOM Beautiful picture Dave, gorgeous picture. Thank you.

SCOTT Oh fine, Oh good, that AGC is a great idea. Okay Joe, I'm ready to go to work.

CAPCOM Okay Dave, we want you to try to get the heat flow drill in at least another section. We think that perhaps there might be an extra section added on the unit you started yesterday.

SCOTT All righty.

CAPCOM If you'll tell me what's there, I'll continue it, one or maybe two sections, however many you think you can put on and still drill. Once you get the sections on, we want you to use the drill again and first recycle the check

CAPCOM several times as you used to do in the simulation and then start the drill and put only a few pounds of force on the top of the drill and while it's running if you notice from the torque that it starts to freeze up, we want you to try to pull back out of the hole a bit to free it, as you drill. Over.

SCOTT To free the probe, huh?

CAPCOM Roger, just try to free the torque that the drill is picking up from the soil that seems to be binding around it, soil and/or rock that is binding around it. And we think that the secret to this may be not to put quite so much pressure on the top of the drill.

SCOTT Okay. I see, I understand that.

CAPCOM And you might want to check it out before you get started.

SCOTT Yes sir.

CAPCOM And Jim, how are you doing?

IRWIN Just about finished, Joe.

CAPCOM Okay, Jim, it sounds good, we want you to deploy the flag after you finish the photography and we are wondering at the moment where the two empty core tubes are. If they are still in bag 5, we'll want you to carry them in your hand out toward the ALSEP station later on.

IRWIN They are under my seat, Joe.

CAPCOM Okay, and unless I miss my guess, your seat is out near the ALSEP now, so that is beautiful.

IRWIN Yeah. Why do you want them out near the ALSEP, Joe?

CAPCOM Jim, I don't know how to break this news to you, but we are going to do Station 8 out at the ALSEP site or nearby. Saving it especially for you.

IRWIN Oh, ha, ha, thank you Joe.

SCOTT Before we got out this morning, we figured you guys . . . before we got out this morning, we figured you guys had a conspiracy against us, having Jim doing Station 8 and me drilling at the same time.

CAPCOM It may work out that way. And Jim, you just could get the flag out, don't necessarily deploy it. We'll get that later when the TV's back at Falcon. And keep me posted on your progress gear when you finish pulling the flag out of its holder, but not yet deployed, we'll ask you to walk on out to the ALSEP site..

SCOTT Okay Joe, I got the drill on one extra section, now, run through it again please.

CAPCOM Okay Dave, we are interested in your starting to drill, we've got a lot of power left in the drill, just run

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CAPCOM it around several times and don't bear down it too much, but see how free or how freely it moves in the surficial layer there first of all.

SCOTT Okay. Joe, I put very little force on it and it binds up.

CAPCOM Roger, any luck by trying to pull it back a bit out the hole to free it?

SCOTT No, it pulls me right on down with it.

CAPCOM Okay Dave, stand by a second.

SCOTT Okay.

CAPCOM Dave, is it possible at all to clear out the flux on it by lifting out as you turn the power on?

SCOTT I . . I'll try, but it seems to want to pull me with it. There, I got it up.

IRWIN Joe, I have the flag unpacked here, but not deployed.

CAPCOM That's exactly right, Jim. We want you now to proceed on out towards Dave and be back with you in a minute.

IRWIN You want me to carry the staff and the flag out there, huh?

CAPCOM Negative, negative, leave it near the LM, we'll pick it up a little later when we come back to the Falcon. Just leave it there in a convenient place.

IRWIN Oh, okay. I thought we were going to do the Station 8 with the flag waving in the background.

SCOTT Okay, Joe, now I've got the drill partially out, you want to try, you want me to try and take the drill off the probe?

CAPCOM Dave, we wonder if you can just hold it there, begin it running and ease it back down into the hole

END OF TAPE

CAPCOM Dave we wonder if you can just hold it there, begin at running and ease it back down into the hole, but without a whole lot of force down into the hole.

SCOTT Okay.

CAPCOM And just let it run for a while, a lot of power in that battery.

SCOTT I'm not putting any force on it. I'm letting it do it, it's own forcing.

CAPCOM Okay, let her run. We've got alot of power to burn.

SCOTT It's a great massage.

IRWIN Hey, I want to come out and get some of that.

SCOTT It starts to bind up every once in a while.

CAPCOM Okay, Jim, when you get out to the ALSEP sight, once again being very careful with your dust and particularly the exposed side experiment. We'd like for you to do a photo pan out there and - stand by, let's see stand by.

CAPCOM And Dave, take a breather there.

SCOTT Yea it - it's tightening up again, Joe, and I'm not putting any force on it at all. It's pulls itself down in, and then it starts to bind up.

CAPCOM Roger, copy.

IRWIN Dave I hope we get a chance to pick that rock up before we go back.

SCOTT Which one.

IRWIN Over here, that black glassy one.

SCOTT Oh, is it a nice one.

IRWIN Yea, get a look, it's sitting right on the surface. (garble)

CAPCOM Dave, if you can tell that drill is going down. We're going to have about 2 more minutes and call it quits probably. So just take a breather there.

SCOTT Oh, I, no I, just don't want to break it.

IRWIN Joe, I'm at the ALSEP sight, and I'm tippy toeing over to the LSM.

CAPCOM Roger.

SCOTT Gee, Joe, I think I got through something, it's easier.

CAPCOM Roger, Dave, and we're learning things.

SCOTT Yea, I guess we are. Let me take a little break here. It just started easing up there and went down a little easier. Like (laughter) we might have gotten through a layer, huh.

CAPCOM Roger, I hope we're not going to let the air out.

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SCOTT Yea, and me.
IRWIN Dave, I'm wondering if we're really serious about station 8. Whether maybe we could get started on that, and I could be doing, my task while you're working there.
SCOTT Yea (garble)
CAPCOM That sounds good to us Jim and Dave, I think maybe you could put another section on that.
SCOTT Yes sir I could if can - let's see if I can get the drill out. It's bound in again Joe.
CAPCOM Roger.
SCOTT Let's try the old vice.
IRWIN Joe, you had a question about the bubble on the central station.
CAPCOM Jim, we're happy with that, no problem.
IRWIN Okay, cause it's sitting, the outer edge of the bubble is at the outer edge of the black mark.
CAPCOM Okay, copy, thank you.
IRWIN Black circular mark.
CAPCOM Thank you. Jim you've got your camera there, you might go out and start to photograph the heat flow sight, if that looks like a reasonable thing.
IRWIN Okay, Dave didn't get those pictures yesterday, huh.
CAPCOM Negative, we need those yet.
DAVE I didn't get those, Jim.
IRWIN Okay.
CAPCOM And, have you taken a photo pan from the ALSEP sight.
IRWIN No.
CAPCOM Okay, we'd like that please.
IRWIN But I'll probably be running out of film.
CAPCOM Okay, there still more mags under the seat there, if you want to change them out.
IRWIN Yea, okay.
IRWIN Okay, the pan at the ALSEP site is complete. I'll go out and photo the heat flow.
CAPCOM Roger.
CAPCOM Okay, Dave take heart. You've got just one minute of drilling left.
SCOTT Okay, Joe. Just the - the only things that give out are the hands. I'll tell you, you know all this working with the gloves on, it after a while -
IRWIN Okay, Joe, this mag ran out. I'll go back and change.
CAPCOM Okay, Jim.

END OF TAPE

CAPCOM And Dave, we're satisfied with this drill hole. Suggest you stop, pull the drill off, and implace the heat flow probe.

SCOTT Okay, we made a little money, didn't we?

CAPCOM Hand over fist.

IRWIN I don't think we have another color mag out here, do we Joe, we'll have to use black and white.

CAPCOM That's affirm, Jim, any mag that's empty. That is to say any mag's that's still full.

IRWIN (Garbled)

CAPCOM And not exposed, and you can look at the frame number.

IRWIN I thought you'd be able to give me a quick reading.

CAPCOM Sorry, Oboe, oboe.

IRWIN I already have it.

SCOTT Somehow all this wire down close to the probe got wrapped with Teflon or something; makes it a lot bigger than we've been used to seeing. Joe, looks like, hm, we might have a problem. Let's see. Can always pull those out and put 4 more in. Joe, I don't think I got the probes all the way down; I think that probably one of those cores may have been bent or something, what do you think about that?

CAPCOM Stand by. Dave, would it be possible to pull it up a little bit so you can see the top of the probe and put the rammer/jammer right on top of it?

SCOTT That's where I had it, Joe, right on top. The probe went down a couple, 2 out of the 4.

CAPCOM Dave, pull the probe out all the way and see if the rammer/jammer alone will go in, please.

SCOTT Okay. Sure does.

CAPCOM Roger, Dave.

SCOTT And the front of the probe looks Okay.

CAPCOM Okay, why don't we try it again.

SCOTT All righty. The tip of the rammer/jammer is smaller than the tip of the probe.

IRWIN Okay, Joe, the ALSEP pictures are complete.

CAPCOM Roger, Jim, we copy that. Stand by a minute. And Jim, we find it's about time you start on your station #8 prints, if you would please.

IRWIN Thanks a lot.

SCOTT Hey Joe, it won't go in any further than that without really trying to force it. I can try and push it with the rammer if you want, but I suspect the first thing would be the rammer would collapse.

CAPCOM Stand by. Okay, Dave, our reading is - using your calibrated arm, put about 15 to 20 pounds of force on it, and we'll be satisfied with whatever we get.

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SCOTT Okay. No way.

CAPCOM Okay, that's good.

SCOTT It's stuck, Joe, and I think where it's stuck is where the third probe joins the second probe. You know you can never get those things apart. We could stick - I got 4 other probes in here if you want me to pull out the 4 we got and stick the other 4 in - in hopes that it gets down some distance, we can try that if you like.

CAPCOM Stand by. Dave, we'd like the rammer/jammer reading, have it pulled out, then we'll take what we got. It's a good job.

SCOTT Okay, sorry I couldn't get it all the way in 'cause that sure isn't very far. Bravo 9.

CAPCOM Roger. And Dave, could you give us an outside reading?

END OF TAPE

CAPCOM And Dave, could you give us an outside reading?

SCOTT An outside reading? What do you mean?

CAPCOM Never mind, we got it already off the TV, just how high the pipe comes up above the surface, because we'd like for you to make sure the dirt is solid against the outside the pipe and then ask you to police the area as best you can of foreign objects.

SCOTT Okay. (garble)

CAPCOM And as you leave, we want you to make sure the cables are lying as flatly as possible on the surface.

SCOTT Okay, and also make sure that the boxes are lined.

CAPCOM Good idea.

SCOTT And I'll leave this here maybe, actually I can fix it.

CAPCOM Roger. And Dave, you'll be interested to know that probe went in as far as it will go, that's as deep as the hole was.

SCOTT Really, you'd a fooled me.

CAPCOM Roger, Dave, and while you are there at the box, could you check to see if the boyd bolt cup, the sleeves have been taken away from the box.

SCOTT No, they haven't Joe, there were a couple of red washers sitting on the . . the connectors there, the sleeves are gone, yeah.

CAPCOM Okay, we copy, thank you.

CAPCOM And Jim, how are you doing?

IRWIN Oh, I picked up a pink rock and a black rock. And they're documented. I'm just resting up for Station 8.

CAPCOM Not a bad idea.

IRWIN There's (garble)

CAPCOM Your box is up in up in (garble)

IRWIN Yeah.

SCOTT Okay, Joe, its aligned and the number is just about down to the center line on two.

CAPCOM Okay Dave, copy, and Jim what are you up to there.

IRWIN Oh, I'm just checking the central station.

CAPCOM Roger, the alignment is beautiful.

IRWIN And Joe it shifted. Hey, don't touch it.

CAPCOM You've got it working perfectly.

IRWIN I won't touch it Joe, I swear.

SCOTT Hey Joe, if Jim took a picture of the heat flow box, the one he took probably isn't representative of the proper alignment which it now has.

IRWIN I'll come over and take another one.
SCOTT Okay, come on over.
CAPCOM Jim, just make sure you are well clear of the antenna, with your PLSS there old friend.
IRWIN I need an antenna like that on my PLSS. I picked up that gl . . black glass you brought Dave.
SCOTT Good.
IRWIN And I picked up another pink one that looked like it had a lot of the (garble) glass in it.
SCOTT Good, step on this, I'm trying to get it stretched out flat. There. Okay, it's dandy. It's got some dirt on it, but that's all right. Okay Joe, what's next on the agenda.
IRWIN Station 8.
CAPCOM I copy your question, Dave, and standby and take a breather, we are thinking about it here.
IRWIN Dave, if you just pick a site, I could sure start digging.
CAPCOM Dave, why don't you do that?
IRWIN I've been resting.
SCOTT Okay, just go after it.
IRWIN I'll be over at the Rover, Dave.
SCOTT Be right there.
CAPCOM Dave, we've got some instructions when you are ready.
SCOTT Ready, go.
CAPCOM Rog, get Jim started on the ditching experiment, if you would please, and then I've got another good one to lay on you here. Don't quite know how to explain it. We'd like for you to try to get the deep core for us with the drill.
SCOTT Right Joe, you didn't even have to tell me, because I knew darn well that was coming with the stuff that we must be on top of here. Okay.
CAPCOM Roger, look at it like this, Jim is going to be digging at the sametime.
SCOTT Rog.
IRWIN Well the thing is, do we want to do the whole Station 8 activity, the comprehensive sample?
SCOTT Sure, cause if they want to do Station 8, they want to do Station 8.
IRWIN Okay.
SCOTT I guess, comprehensive sample first, I reckon. Okay, LRB is not parked in the right spot, they could get TV.
IRWIN Hey, lets just turn it around, lift it up and turn it.
SCOTT No they won't like that because the TV is

SCOTT all messed up then. Oh boy.
Listen, lets just play it out here in front,
right out over there and pretend like that is the side of
the LRV except the 16 millimeter won't be in the right spot.
Oh boy. Show buzz.

IRWIN You . . we could aim the 16 out this way,
out to the west.

SCOTT Yeah, let me . . yeh, yeh Houston, what
would you rather have 16 millimeter movies of Station 8 or
TV movies of Station 8?

CAPCOM Dave, we copy that question, stand by.

SCOTT Yeah, by the time we stand by, and you get
to a decision, . .

CAPCOM Roger, and we'll take TV, that's plenty
good enough.

SCOTT Oh, okay.

CAPCOM And Jim, will you get started with the
transfer and Dave, once you get him started, we can begin
with the drill.

SCOTT Okay.

IRWIN Okay, I guess we really want to start the
trench first, Dave.

SCOTT Yeah.

IRWIN Yeah, let me get the gnomon yeah and I'll get
the comprehensive later, if we have a chance.

SCOTT Yeah. You better. . boy.

CAPCOM That's affirmative, Jim.

SCOTT I better have your camera, because I have
lets go out here where it's fresh.

IRWIN Let me take the camera off.

SCOTT Bring it to me.

IRWIN Yeah.

SCOTT Just leave it there, you can take it and
I'll come too.

IRWIN You're coming by here anyway.

SCOTT Yeah.

IRWIN Just get me started, you want me to dig
down to that bedrock.

SCOTT Say again.

IRWIN You want me to dig down to bedrock.

SCOTT Yeah. . yeah, that's down. Yeah. Bedrock.
You remember how . . you know how the Rover would normally
be .

IRWIN We need your . . we need the pictures.

SCOTT Yeah, I'll get it. Okay I got it.

CAPCOM Dave, a couple of comments here and Jim,
as well, we're going to be departing this site for the closeout

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in about 30 minutes, so you're looking real good on the time and we'll just pick up whatever we can, no rush on any of it. Dave, you'll want to think a minute about where that trundle probably is

END OF TAPE

CAPCOM Dave, a couple of comments here, and Jim as well. We're going to be departing this sight for the close out in about 30 minutes, so you're looking real good on the time, and we'll just pick up whatever we can. No rush on any of it. Dave, you'll want to think a minute about where that trundle probably is.

SCOTT Yea, I think I know where it is Joe. I've been thinking. Okay Jim. Have at it old buddy.

IRWIN Okay Dave, thanks for getting me off to such a good start here.

SCOTT Over there by the gnomon and take a little right turn there and let me get the down sun pre picture here. I've got it. Okay, have at it, while I go find my favorite little piece here. I see it.

IRWIN You've got your favorite task and I've got mine.

SCOTT Yea, man.

SCOTT We'll pan down and away real quick.

IRWIN Joe, do you only want it 12 inches deep?

CAPCOM What ever you think is reasonable Jim.

IRWIN I'm down that far already.

CAPCOM Boy, you do fast work.

IRWIN The wall that I'm - too bad the TV's there Joe, you can't see the wall. Too bad, the wall is very smooth.

CAPCOM Now, you're bragging.

IRWIN The wall is fine yet very cohesive.

CAPCOM Roger, and we'll stand by for a verbal description in fact.

CAPCOM Any sign of layering?

IRWIN No signs of layering. I do find some small fragments, white fragments, small fragments, I just exposed a very small fragment about 3 millimeters of a black glass, but the wall that I've got here is only, no signs of layering at all.

CAPCOM Roger.

SCOTT Tell me when you're ready for pictures, Jimmie.

IRWIN I think I'm just about ready, Dave.

SCOTT Okay. Okay, let me take your pictures then.

IRWIN Come over and see what you think, check.

SCOTT I think you're not getting the penetrometer all the way down there. It's a great trench.

IRWIN Not, not wide enough you think.

SCOTT It's not going to be big enough for
the ears.
IRWIN Not long enough, huh.
SCOTT Yea, I hate to tell you that. Sorry
about that.
IRWIN Do you want to make a bet on that one?
SCOTT Oh, yea.
IRWIN When I get down under the 12 inch
layer, the surface is much harder, harder to dig through.
CAPCOM Copy that Jim.
IRWIN Like more of black glass fragments. It's
more cohesive down about - We ought to get a good sample at
the bottom of this.
CAPCOM Yes sir.
IRWIN It's easy to make a flat bottom because
it's so hard. I can see why Dave had a hard time digging
through it, going through it now.
SCOTT You know Jim, I've got a checklist
on the left arm for one thing that's going on now, and a
checklist on the right arm for something else that's going on
now. (laughter)
IRWIN Wow.
SCOTT Unreal.
SCOTT Okay, change 16. Okay, it looks like
the Echo magazine worked okay.
CAPCOM Roger Dave, was that from you.
SCOTT Yes sir that's from me, and I'm going
to put Foxtrot on the 16.
CAPCOM Okay, beautiful.
SCOTT Do this according to Hoyle.
CAPCOM Jim, that's a beautiful trench. Let's
stop with that one and document it. We'll want samples from
the bottom please.
IRWIN You're kidding, I think I've hit bedrock. I
think I've hit the bed rock. Okay Dave, here you are.
SCOTT Okay, I'm coming over right now.
CAPCOM Dave, you might want to bring the ESC
from under the seat.
SCOTT Okay, Joe.
IRWIN I'll take a break while you photo,
Dave.
SCOTT Probably a good idea. Good idea. I'll
come do some photo then. Oh, that's a neat trench.
IRWIN Do you think it's long enough?
SCOTT Oh, yes. That's just super.
IRWIN I really do think I've almost down
to bedrock. It really is hard.
SCOTT Is that right?

IRWIN Yea, that's a good sample there from
the bottom.

SCOTT It looks like it has a little color
change down there too.

IRWIN Yea, maybe a slight.

SCOTT It seems to get a little darker, a
little lighter and a little darker. A shadow in the way here.
I have the photos.

IRWIN The walls are just about vertical on
the trench Joe.

SCOTT Okay, we need an SCSC.

CAPCOM Roger, Jim.

IRWIN 3 quarters full.

CAPCOM Okay, Dave and Jim. Jim we think
you can collect the samples here pretty well, and Dave in
order to get that drill task accomplished, we're going to
have to get you started on that shortly.

SCOTT Okay, he can't get the SCSC very
well by himself, I don't think Joe.

END OF TAPE.

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CAPCOM -- collect the samples pretty well and, Dave, in order to get that, that drill task accomplished, we're going to have to get you started on that shortly.

SCOTT Okay, I - he can't get - the SESC very well by himself, I don't think, Joe.

SCOTT It's tough for two of us to get.

CAPCOM Okay, when you finish that, press on with the drill.

IRWIN Can you (garbled).

CAPCOM And while you're down in there, how deep do you think it is?

SCOTT Easy, don't beat the handle, I'll drop it, it's too slippery. I need one more.

IRWIN Okay.

SCOTT Oh, I'd say it's 14, 16 inches deep, Joe.

CAPCOM Extraordinary, thank you.

IRWIN Okay, Dave, I tilt it up.

SCOTT White clast in there, a bit more, keep coming. Good job.

IRWIN Think we got enough.

SCOTT Yes sir, we got 75 percent full.

CAPCOM Outstanding.

IRWIN Okay, you're going to leave me and I'll sample myself. I guess I'll fill the bags myself then.

SCOTT I guess you'll have to.

IRWIN Okay.

SCOTT Okay, unless you want to go do the drill.

IRWIN Not at all, brother.

SCOTT You got her.

IRWIN I'll do all the

SCOTT Why don't you loan me your checklist (Laughter)

Oh yeah, guess what.

IRWIN Joe talked me through it.

SCOTT Which bag do you want to put the SESC in, Joe, while I got it here? I'm sure you've been thinking of that.

IRWIN Heh, heh, that figures - I'm gonna toss -- (garbled).

CAPCOM Anyone fine.

IRWIN -- Uh, too late.

SCOTT Jim.

IRWIN Got it, press on. Okay, Joe, I'm gonna do (ha, ha, ha) a little sampling of the trench.

CAPCOM I hear you.

SCOTT Carry on to the bags. A little unorthodox. I'm going to drill. Watch me.

IRWIN It probably won't be quite as much of a sample here since I'm doing it myself, Joe.

CAPCOM Dave, is the SCSC stowed now?

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SCOTT It's in the seat pan right now, we'll get to it later, Joe.

CAPCOM That's fine, that's a perfect place, couldn't have suggested any better myself.

SCOTT Good.

CAPCOM And DR's - you know already, all we need from this EVA is really the hole in the ground, the drill will probably give out on us during your rest period, and if need be, we can pull up whatever you get later on.

SCOTT Okay, Joe, fine.

CAPCOM You wouldn't want to go on toward the North Complex without visiting the ALSEP site again, would you?

SCOTT No, never.

IRWIN Okay, Joe, the soil samples in the bottom of the trench is at 2 5 2.

CAPCOM 2 5 2, great. And Dave and Jim, we're coming up on 15 minutes, 1 5 minutes before closeout.

SCOTT Doing our best, Joe.

CAPCOM Roger, and you've done yeoman service.

IRWIN I had to get in your way here, ol' buddy,

SCOTT I'll get out of here.

IRWIN Yea, that'd be a good idea. I need to use this area.

IRWIN Joe, I'm going to skip sampling the side, I'm just gonna sample the top over here.

CAPCOM Okay, Jim, sounds good, if you don't see layering.

IRWIN -- so I can get on with the penetrometer.

CAPCOM Okay.

SCOTT Shadows really make a difference up here.

IRWIN Okay, Joe, on the top of the trench, 253.

CAPCOM Roger, 253.

SCOTT You're getting in the way of the camera, ol' buddy.

IRWIN I steal into your picture.

SCOTT -- if we're going to use all that film.

IRWIN I gotta get some bags here, man.

CAPCOM That's fine, we can still see.

IRWIN Dave's talking about the other one. Okay, I'm going for the penetrometer.

SCOTT Your camera's in your seat pad if you need it.

IRWIN No, I don't think I'll - I can't take pictures and do penetrometer at the same time.

SCOTT Why not? Sorry about that.

CAPCOM Dave, you'll get a warning horn and you'll want to over to your Ox water shortly. Just wanted to advise you.

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SCOTT Okay, Joe, thank you.

CAPCOM And, Dave, you'll want to drop into the ground as slowly as you can easily control.

SCOTT Oh, I forgot, I'm sorry. Just in a hurry to get it done and I just forgot your one inch per second. Now I'll do that. Some days - . Okay, I got a horn, a tone Ox water.

CAPCOM And, Dave, go to Min cooling, please.

SCOTT Hey, Jim. Jim, would you get my Ox water. I just can't feel in there.

IRWIN I know what you mean. Okay, do you want me to put you on Min cooling at the same time?

SCOTT No, I've got the Min cooling, I just couldn't feel the Ox water.

IRWIN Okay. I can do it, I'm right here.

SCOTT No, I've got the Min cooling. Cable's caught on the collar.

CAPCOM Roger.

IRWIN Okay, Joe, I have the half inch cone installed and I'm going to - sitting on 1, I'm going to index it to 2.

CAPCOM Okay, Jim. Dave, as soon as you get that unstuck, you'll want to back it off 1 and 1/2 turns, it'll come loose.

SCOTT I know, Joe, You can't bend over as far here as you can in 1-G.

END OF TAPE

SCOTT Joe, you can't bend over as far here as you can in 1 G.

IRWIN Joe, I hope you can watch this on TV. The ground plate I pull it down, and the spring is too strong. I pull the ground plate up.

CAPCOM Okay Jim, we watch. No problem.

IRWIN The ground plate is there, maybe it'll stay there. I'm doing the 1 adjacent, and I'm doing it adjacent to the trench.

CAPCOM Roger.

IRWIN Right here, and I'm pushing, I've bottomed out.

CAPCOM Roger.

IRWIN These prints might stay here Dave, so I can photograph them later.

SCOTT Yea. Where I took it.

IRWIN Okay, hole is adjacent to the trench. I'm indexing the 3, and I'm going to do the trench bottom.

CAPCOM Beautiful, and Dave you might check your film mag, if you're back at the rover now. See if it's run out, and I'm talking about the dac.

SCOTT I don't think it would have run out by now Joe.

SCOTT That's what I'm saying, it wouldn't have run out by now. I just turned it on. 12 frames per second and it looks like it's 90 percent gone.

CAPCOM Okay, beautiful, outstanding.

SCOTT And I need a call when my sublimator gets going Joe.

IRWIN Okay, I'm in a trench bottom and I'm pushing. And I'm bottomed out.

CAPCOM Rober, and Dave, the diverter valve is yours.

SCOTT Thank you. Okay -

CAPCOM Stand by please.

SCOTT The water flag clear Joe. Oh that feels so good.

IRWIN Okay, I'm going for the rover track.

CAPCOM Roger.

IRWIN Okay, I'm on the very freshest rover track.

CAPCOM The very freshest.

IRWIN And I'm pushing.

CAPCOM Roger.

IRWIN I've bottomed out. I'm indexing to 5.

CAPCOM Roger.

CAPCOM And Dave and Jim, it's coming up on
5 minutes remaining before close out.

SCOTT Okay.

IRWIN Okay, adjacent to the rover tracks. Pushing

CAPCOM Roger.

IRWIN Bottomed out. We don't want to leave
here before I get a chance to collapse my trench, Joe.

CAPCOM You've got 5 minutes Jim. Play it
accordingly, and I thought that was my job.

IRWIN Okay, I'm going for the plate.

CAPCOM Roger.

SCOTT I see why we planned all this before
I came.

IRWIN Okay, the plate is installed.

CAPCOM Roger, Jim.

IRWIN Did I index it after the last one, Joe?

CAPCOM Say again.

IRWIN I don't think I indexed it after the
last one.

CAPCOM Okay, try it again, no problem we've
got several here.

CAPCOM Index it again.

IRWIN I'm indexing to 6.

CAPCOM Roger.

IRWIN Indexing to 6 here with the trench
bottom.

CAPCOM Okay.

IRWIN Okay, here goes the trench bottom.

CAPCOM Roger.

IRWIN Bottomed out.

CAPCOM Okay.

IRWIN Indexing to 7.

CAPCOM Roger.

IRWIN Okay, I ought to be collapsing the
trench side, I hope. Okay, I'm about 4 inches out from the
side of the trench. And I'm pushing, it's bottomed out.

CAPCOM Beautiful.

IRWIN It won't collapse.

CAPCOM It won't collapse?

IRWIN I'm continuing to push. Yep, it just
collapsed.

CAPCOM Okay.

SCOTT I'll take a quick picture there so
you can see the locations of all those.

CAPCOM Dave are you working on the last film
there?

SCOTT Yea.

CAPCOM You are one fast worker. Okay Dave and

CAPCOM take a breather, and I've got one last instruction for you hear. Using, the drill, we want you to break it loose and then let the drill and stem sit there in the surface, and we'll pull it out later.

SCOTT Okay, let me finish it off.

CAPCOM And just leave the drill on the stem handle away from the sun as long as the loops pull free.

SCOTT Roger, what?

CAPCOM Rog, as long as the threads pull pull free from the hole.

SCOTT Yea, we'll try that now. Yeah, we can get it. Okay Joe we're in good shape.

CAPCOM Okay, Dave, we want the handle away from the sun, and we're ready for you go get back on the rover.

SCOTT Wait a minute Joe. Not sure I'll ever get it out. What bothers me Joe is, okay, handle away okay handle away from the sun. Box is sort of dirty.

CAPCOM And Jim, we want to end your tasks here and we want you on the rover too please.

IRWIN Let me take a few pictures here, and let me walk back. I can get there faster.

SCOTT Get pictures of the drill, will you Jim.

END OF TAPE

IRWIN Sort of dirty.

CAPCOM And Jim, we want to end your tasks here, we want you on the Rover too, please.

IRWIN Let me take a few pictures here and let me walk back. I can get there faster.

SCOTT Get pictures of the drill will you, Jim.

IRWIN (garble) Hey, just south of the drill, I really - I already did a pan here.

SCOTT Get your trench and get a couple of pictures of the drill to show it's position.

IRWIN Okay.

CAPCOM Okay, Jim. A few pictures and you can walk back and Dave, we want you to start on the Rover, please.

SCOTT Yeah, Joe. I'm on the way.

CAPCOM Okay.

IRWIN Okay, Dave. I think everything - your not going to drive too fast are you?

SCOTT Heck no.

IRWIN Okay, I'll meet you back there.

SCOTT Yeah.

SCOTT Makes dust when you drive fast.

IRWIN Keep it clean.

SCOTT Okay, Joe, you going back to TMWB.

SCOTT Okay, Joe, I'm back at the LM.

SCOTT (garble)

CAPCOM Okay, Dave, copy your back at the LM, parking the Rover normally, and we're standing by for TV again.

SCOTT (garble) Rover (garble)

IRWIN Hey, Dave, you do have some cores now to go in the SRC. Is that right?

SCOTT No.

IRWIN No?

SCOTT No, Jim, I didn't get them out yet.

IRWIN Okay. I guess I'll go ahead and put the bag - that I have here in SRC 2.

CAPCOM Jim, if you can get the SCSC in there that would be great and then go ahead and close out that rock box. No problem on those drill stems, we'll get them later.

CAPCOM Dave, this is Houston, if there's dust on the batt covers, brush it off before you open them please.

SCOTT Okay, Joe. I guess we head north, cross sun, if I remember. (garble). Put it in your pocket place.

IRWIN Huh?

SCOTT Put it in your pocket place here. Yeah. This is north cross sun isn't it.

IRWIN Yeah.

SCOTT That's what I thought.
SCOTT That's north cross sun okay. How's that
Jim, is that okay for you?
IRWIN Yep.
CAPCOM And Dave, this is Houston.
SCOTT Go ahead.
CAPCOM Roger, Dave. While you're brushing the
LRV batt covers, you might as well give the whole area a
good dusting and cleaning, the LCRU covers, the TCU, the
television camera, please.
SCOTT Be glad to, Joe.
SCOTT Taking 3 up this time, Jim.
IRWIN Yeah.
SCOTT This going up end.
IRWIN Yeah.
SCOTT Put all those rocks - -
IRWIN I can get those, Dave.
SCOTT Okay, here's one for you.
IRWIN I'll set it right up by your camera.
SCOTT Okay.
CAPCOM And Jim, are you packing the rock box yet?
IRWIN Yeah, I am.
CAPCOM Roger, did you happen to get a number off
the SESC?
IRWIN Joe did you . . .
IRWIN No, I didn't, but you ought to be able to
track that one, Joe.
CAPCOM We'll track it, no problem.
CAPCOM And Dave, we assume you are dusting and
cleaning now and we'll be standing by for TV.
SCOTT Good. Okay, Joe. I'm not sure I'm going
to take the time to give you the TV unless you really need
it.
CAPCOM Dave, we got a lot of time, we're going to
deploy the flag now and we need the TV please.
SCOTT (laughter) Okay, Joe.
CAPCOM And we're in good shape on the time. We're
back at the LM and we got a lot of time to work with, so no
problem.
SCOTT Okay, Joe. Why don't you give us about
5 minutes with no comment and let us cool it for a while,
okay?
CAPCOM Roger.
SCOTT Cool it, Jim. Just take it easy. Take a
break. That's enough.
IRWIN Okay.
SCOTT We got plenty of time and we're going to
cool it right now.

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IRWIN Okay.

IRWIN Having the same problem with an SRC today as I did yesterday, I have to pound on the handle... to get it sealed.

SCOTT Okay, well just take your time.

IRWIN Yeah, I'm not rushing.

SCOTT Use this 5 minutes as part of our rest period.

CAPCOM Dave and Jim, while you're taking a breather there, let me make a comment. We got 37 minutes before repress so we're in good shape on the time and just for your own information, I know you're curious, your oxygen consumption has been considerably less today, considerably less and we're running well over 7 hour PLSS capability.

SCOTT Okay, Joe. Very good. Just give us 5 minutes with a nothing will you? Just make sure we got a good last 27 minutes.

CAPCOM Yes sir.

IRWIN Dave, I'm going to get you to give me a hand with this.

SCOTT Sure.

IRWIN Almost a 2 man operation.

IRWIN Bring it over here.

IRWIN Want to go to mesa table? Let's go to mesa - -

SCOTT No, it - it's well, yeah it's easier to work with, it's much higher.

IRWIN Okay. I didn't push down on it, I'll lock it. You might have to hit it down.

SCOTT Oh, yeah. (garble)

IRWIN That's what I had to do, had to pound it with my fist yesterday.

SCOTT Okay, let me hold your arm, and use your arm as weight. Okay.

IRWIN Okay.

SCOTT Oh, my. Let me try it this way.

SCOTT Even my total body weight won't do it, so I'm going to have to stick one arm under you.

IRWIN Okay, I had to pound it yesterday to get it closed.

SCOTT Well, it closes, but it doesn't lock.

IRWIN Well, I'll have to push it locked.

SCOTT Really.

IRWIN Yeah, but then it won't spring locked.

SCOTT Okay.

IRWIN Try it again, Dave.

SCOTT That close?

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IRWIN Yeah.

IRWIN Believe me.

IRWIN You ought to have that seal pretty well
made now.

SCOTT Yeah. Try it again.

SCOTT (garble)

SCOTT Jim, it's never going to lock. You know
why? The lock isn't in the right place. Look at that.
That little - look at where the handle is relative to the
lock, you'll never get it over - -

END OF TAPE

IRWIN (garble)
SCOTT Jim, it's never going to lock, you know why? The lock isn't in the right place. See that. Look at where the heel is relative to the lock, you'll never get it over, I've got the handle all the way down.
IRWIN Down.
SCOTT That lock will never lock this way.
IRWIN Lets look at the right one and see if the right one is same way.
SCOTT Okay.
IRWIN The right one is the same way, I don't know how I ever got the one locked yesterday.
SCOTT It can't lock, because the handle was bent up above the lock, there's no way.
IRWIN Yeah.
SCOTT Okay, lets take the stuff out of there and leave the SRC, just leave it, take the stuff in without it.
IRWIN No we'll take it that way.
SCOTT What do we want the SRC for, it's not closed.
IRWIN Well I think we probably have a seal, if we keep these handles in this position, the seal . . the seal is already made, if we could tape those handles down, we probably have a vacuum in there.
SCOTT Yeah, that's true. Okay
IRWIN Just be careful we don't release them.
SCOTT Okay, yeah, you're right. Okay what else do you have to do here. That about it?
IRWIN Well lets take a look at things. Dust each other off. Hey, lets get those cover bags.
SCOTT Oh, that's a good idea.
IRWIN I'll get them if you got something to do out there.
SCOTT Yeah, let me get the TV going here. Okay, got some more rocks on the seat pan too, Jim.
IRWIN Okay.
SCOTT Okay Joe, I'm going to put you on TV here, see if I can't find the good old earth.
CAPCOM Super, Dave, we're waiting and we still have a full half hour remaining, good shape.
SCOTT Okay, I suggest we take it and go nice and slow and easy.
CAPCOM That's exactly right.
IRWIN Okay, I have a sample containment bag out here Dave. I'll just leave them here on top.
SCOTT Okay.
IRWIN I'll come over and pick up those other rock samples.

SCOTT Okay, Joe, the AGC says you ought to have
a picture.
CAPCOM We've got a beautiful picture.
SCOTT The AGC says you ought to have a picture.
CAPCOM We've got a beautiful picture.
SCOTT Of the streaks on the battery covers, huh?
CAPCOM You never know what you might like to look
at.
SCOTT Hey, I can even see the earth, you know
another problem is the earth is getting . . getting smaller.
CAPCOM Roger, Dave, that's one of Kepler's mission
rules.
SCOTT Right. Okay, I got the LCRU battery covers
dusted off and the console on the LRV isn't too bad, I
dusted that off. It wasn't too bad anyway. And I guess
the next order of business . . get the rocks all packed.
IRWIN Okay Dave, I've got all the rock samples
(garble)
SCOTT Okay, get the ETB and get all our film.
IRWIN The only task is getting all this stuff
up.
SCOTT Yeah. We'll use the old . . .
CAPCOM Dave and Jim, once again our TV camera is
stuck in a down position, I wonder if you could give us
some help there and we'd also like an amp/hours reading
from the Rover and the battery temp, please.
IRWIN I'll get that Dave.
CAPCOM Thank you.
IRWIN You're welcome. I'll get that other gear
stuff while you pack.
SCOTT Okay.
IRWIN Okay, amp/hour reading is 91 and 96.
Battery temp is 100 on both.
CAPCOM Beautiful Jim, are we ever making the miles
on that Rover.
SCOTT That's surprising climbing those hills, too.
SCOTT Could you hand me the cameras over there,
Jim?
IRWIN Yeah, lets see I should pull the circuit
breakers on the Rover.
SCOTT I can get them easier over here.
IRWIN If you got fingers left for it.
SCOTT Not much, but I'll try. one, two, three,
four.
IRWIN Okay, got her?
SCOTT Yeah. Okay. Okay, and there should be
another one around here, oh, it's up on the mesa.

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IRWIN Oh, I'll get it for you.
SCOTT No, keep going. Yeah, okay, if you want
to, I'll pick up . . .
IRWIN I don't have anything to do.
SCOTT Okay. Okay, Joe, mag kilo is in and the . .
and somebody's camera with a mag on it.
CAPCOM Roger.
SCOTT Mag Lima is in the ETB, mag November, mag Delta,
mag Echo.
IRWIN Here's the camera, Dave.
SCOTT Okay. CDR camera with mag Oboe.
CAPCOM Roger.
SCOTT Mag, Metro.
CAPCOM Roger.
IRWIN Why don't I start transferring some of this
stuff, Dave.
SCOTT Okay, how?
IRWIN Pick it up.
SCOTT Be careful.
IRWIN Any problem there Joe, if I start picking
this stuff up?
CAPCOM Stand by Jim, just take a breather, lots
of time.
IRWIN Yeah, I know there's lots of time, I just
as soon take my time in getting it up there.
SCOTT Yeah, why don't we cool it. Did you get
the pictures around the LM.
IRWIN Yeah.
SCOTT Yeah, okay.
IRWIN All the pictures taken care of. This TV
cable hanging out here is really dangerous.
SCOTT Yeah, sure is.
IRWIN Okay, I'll wait Dave, I won't pick anything
up.
SCOTT Yeah, I'm just about done here. Mag Foxtrot
in the ETB. Get everything you needed out of the UC pan.
IRWIN Yeah.
SCOTT Got all the rocks?
IRWIN Yep.
SCOTT Okay. Guess I got all of the film.

END OF TAPE

CAPCOM Jim, this is Houston.
IRWIN Okay, go ahead, Joe.
CAPCOM Roger, Jim at your leisure we'd like for you
to deploy the American flag, please.
IRWIN Okay.
IRWIN We ought to keep that jam rod, Dave.
SCOTT (Laughter) I'm getting it out right now.
SCOTT One more the color of magazine. That's black
and white, though.
IRWIN Does -
SCOTT (Garble) if we get plenty of time.
IRWIN Which one works? Mine or yours.
SCOTT Yours.
IRWIN Okay.
SCOTT Can't get started up, take care of this.
IRWIN I'll take the staff out, Dave.
SCOTT Good idea if I need to.
SCOTT Hey, we don't have any color.
CAPCOM Dave, we'll get color next time no problem,
you've got a beautiful color TV camera looking at you.
SCOTT Yeah okay.
SCOTT That's a shame.
IRWIN Yep, black and white.
CAPCOM And, Jim if possible we'd like for you to come
around north of the rover there to the (Garble) and work back
in the camera in that direction.
IRWIN Tell me when I'm in a good position.
SCOTT Over here, Jim.
IRWIN It would be better to have the LM is a - -
SCOTT Right here where we usually do it.
IRWIN (Garble) Hadley.
SCOTT What.
IRWIN That's Hadley in the background.
SCOTT Sure right there.
CAPCOM Beautiful right there.
IRWIN How's that (garble)
IRWIN Okay, I'm pushing the staff in.
SCOTT Okay.
IRWIN I'll hit it a few times so it'll stay up here
for a few million years.
SCOTT Good idea.
IRWIN Course, it might make it too low.
SCOTT I don't think so.
IRWIN Pretty, you've got to admit. Okay.
IRWIN Let's see, do you want to swing it around per-
pendicular to the camera, huh.
SCOTT Okay. It's pretty good.
IRWIN Why don't you stand there.
SCOTT Let me get up on the high part.

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IRWIN Okay. Gee, I wish we had color.
SCOTT Yes.
CAPCOM We'll have the color tomorrow, Dave. (Garble)
especially for you.
SCOTT (Garble). Okay. Okay.
IRWIN Careful.
SCOTT Can't back up here so I can get all of that in
there. There that's good, good. Got the mountain, got the
LM.
IRWIN Great. Got it?
SCOTT Yep.
IRWIN Dave.
SCOTT (Garble).
CAPCOM And Jim you'll get a feed water tone in about
a minute. Just wanted to warn you and we're coming up on
20 minutes remaining 20.
IRWIN Okay. That is a good picture.
SCOTT A neat picture.
IRWIN A little to the left. Let's try another study.
How about an F 8.
SCOTT Yes, try an F 8.
IRWIN Look at that.
SCOTT Yes.
IRWIN That's eleven there.
SCOTT That's what it call, Ed, in the -
IRWIN Yes.
SCOTT Okay, now take you again (Garble).
IRWIN Okay.
SCOTT Ah, you look colorful.
IRWIN Even with the dirt, huh.
SCOTT Okay. You like that side there, Joe.
CAPCOM It's beautiful.
SCOTT Yes, we think it's pretty nice too.
IRWIN Can I get in now.
CAPCOM Jim, your coming up on feed water com, promptly.
IRWIN (Garble).
IRWIN Okay. Good timing, Joe I've got it. Dave will
you put me on - -
SCOTT Yes.
IRWIN Get my deverter belt to the min if you would.
SCOTT Sure. Deverter belt's to min. Ox water is
open. Okay we got everything.
IRWIN Think we do.
SCOTT Now to start back in.
CAPCOM Okay, Dave and Jim we know you've dusted off
our TV gear we want you to open the LRB back covers, please.
And give us a status check of the battery mirrors mainly are
they dusty or not.
SCOTT Good thought. Let me wait until I get a good

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SCOTT start on my mind, Dave. Go to intermediate
for getting in.
CAPCOM Okay.
IRWIN That's not a bad idea.
SCOTT We got to dust each other off, too.
IRWIN Man, I need to dust these battery covers too.
SCOTT Okay, I'll bring the brush around.
IRWIN Fairly glued. There, it's open.
SCOTT Oh get the maps. I almost forgot the maps.
CAPCOM Dave, this is Houston.
SCOTT Go ahead, Houston.
CAPCOM Roger, Dave I think you still need the mag from
the dac and from the 500 mm camera.
SCOTT No, there both in here, Joe. I called them
both out. Both tucked away in the ETB.
IRWIN All the mirrors is cracked, huh.
SCOTT Which way.
IRWIN TV.
SCOTT Really.
IRWIN Yes.
SCOTT See that. Yes, two little squares.

END OF TAPE

SCOTT Yes, 2 little squares.
SCOTT Oh, we've got to turn the camera around too, Jim.
CAPCOM Okay Jim, your diverter back.
IRWIN High option now, huh. Okay.
SCOTT Okay, let's head on in, Jim.
IRWIN (garble)
SCOTT Let me dust you off, you're dirty.
Let's head on in.
SCOTT Okay turn around to your left. (garble)
SCOTT Okay, that's most of it. How did your front get so dirty?
SCOTT Oh, I know, you pulled an Irwin.
CAPCOM And Dave and Jim, while you're doing the dusting there, did you get a check on the LRV mirrors for us if so I must not have copied.
IRWIN Yea, there both opened and all four have been dusted.
CAPCOM Okay, good.
IRWIN The tape came off your PLSS Dave.
SCOTT Did it really.
IRWIN Yea, it's ripped on both sides now.
SCOTT I wonder where I'm getting that.
IRWIN Might be getting it in the rover.
SCOTT Yep, it could be. I think I see where I'm getting it. No it couldn't be there.
IRWIN No the seats are smooth. Okay, Dave.
SCOTT Okay, give me the brush and I'll put it back. You can head in and crank up the LEC and we'll haul all that stuff up nice and easy like.
IRWIN Okay, okay, I won't even try and take a bag up now.
SCOTT No, let's take it easy.
IRWIN Okay.
SCOTT We have plenty of time and nothing's pressing.
IRWIN What's the battery that I have stowed here in this foot pad Dave?
SCOTT That's the LCRU battery for the next go.
IRWIN Yeah.
SCOTT Yeah, I guess we leave it there don't we Jim.
IRWIN Yea, leave it in the shadow.
SCOTT Okay. (Garble)
SCOTT Knock it out of it's little blanket.
IRWIN You're going to have to come up and hand me the LEC because we didn't get it in last time.
SCOTT Okay, I'll do that.
CAPCOM Dave, this is Houston.
SCOTT Houston, go.

CAPCOM Rog DR, we're thinking that that SRC is not closed very well, we're wondering if it'll go on the LEC properly.

SCOTT Yea, you're right. It would probably, but I guess we'll not take a chance. I'll carry the -

IRWIN I can send some tape out Dave.

SCOTT What.

IRWIN I can send some tape out. Hey Dave, I know what you could do.

SCOTT What.

IRWIN Is put it in one of those bull duram sacks -

SCOTT No, I'll carry it up easy.

IRWIN Okay.

SCOTT Okay, I'll carry it up right here.

SCOTT How are you doing in there?

IRWIN I'm in.

SCOTT You are.

IRWIN Yea, I'm waiting for you.

SCOTT Okay.

IRWIN It's alot easier with the hatch open.

SCOTT Huh.

IRWIN It's a lot easier with the hatch open.

SCOTT Oh, all the way you mean.

IRWIN Yea. Maybe a little fine PSI on that SRC will close it.

SCOTT Yea. Let's see, let me get to where I can get the handle around to you. Well I don't know whether we can get it or not. Maybe, here, can I help you.

IRWIN No, if you'll hand me the LEC. I used that yesterday. I can use the hook on the LEC to grab it coming up.

SCOTT Okay, wait maybe I can just stick my middle in here.

IRWIN The LEC makes a good handle, a good claw to grab those.

SCOTT Oh that, yea that's a good, oh the front part of the others. Okay.

IRWIN Hand it to me.

CAPCOM Dave and Jim, we're standing by for the 4 pieces of luggage as they go in. We'd like for you to call them out to us.

SCOTT Sure will.

CAPCOM And Dave, this is Houston. The next time you go back to the rover, we need some help on that good old TV camera again. We've got it stuck pointed straight up.

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SCOTT Oh my. You're looking at the earth,
huh. Earth gazing. Okay, Jim's RC is in Joe.
CAPCOM We copy.
IRWIN Okay, the ETB is up, Dave, the LEC rather.
SCOTT Okay, just a second. Straight up.
I knew Ed would get hung up sooner or later.
IRWIN Hey Joe, are you ready?
SCOTT No, no, not yet Jim. I was just
fixing the TV.
CAPCOM I want to thank you, Dave. We were
barely up there momentarily.
SCOTT Well that's alright Joe, nobody's
perfect. (garble) is sure getting short. Okay partner have
at it.
IRWIN Okay, what am I pulling up?
SCOTT ETB.
IRWIN Tell me when to slow down.
SCOTT Okay, you're doing fine, keep going.
Okay now, that's it, now pull it once more time. Okay, right -
oh shoot, I'm sorry. There's so much dirt on this thing.
Okay, okay now ease it over, okay -

END OF TAPE.

IRWIN Got it. Right.
SCOTT Oh shoot, I'm sorry, there's so much dirt
on this thing. Okay now, ease it over.
IRWIN Okay.
SCOTT There you go, got it?
IRWIN Yep. Guess I got dirty again.
SCOTT Brush yourself off.
IRWIN Yeah, that's better. The LEC is ready
to come back out, Dave.
SCOTT Okay. Okay, I'm going to just carry the
rock bags up. It's a lot easier.
IRWIN Okay, when you get down, pull the LEC out.
SCOTT Yeah, I will.
IRWIN Stow it on the porch.
SCOTT Oop. I'll tell you one thing - -
IRWIN Yeah, that's what I thought. Watch the lid
doesn't come off.
SCOTT Okay. How'd you guess.
IRWIN Just hold up, Dave, I'll get my claw and
use it to grab the . .
SCOTT Okay.
IRWIN Got it.
scott Good. Okay, I'll be right back with
another one.
IRWIN Okay.
SCOTT I think we got a few rocks today.
IRWIN Yeah, I think we made up for yesterday.
SCOTT Yep. Let's see, we got our food in don't
we.
IRWIN Yep. You working up an appetite.
SCOTT Boy, better believe.
CAPCOM Dave, this is Houston, give me a call on
what you are loading now, please.
SCOTT Oh, I just took in . . what rock bag was
that, Joe, I mean Jim?
IRWIN We are going . . uh, we have all the
samples.
SCOTT I know, but what rock bag did I just give
you.
IRWIN Oh.
SCOTT You know?
IRWIN It's number 6.
SCOTT Okay.
CAPCOM Okay, and I guess the ETB to go, is that
right?
SCOTT ETB is in Joe.
CAPCOM Okay, four items, I'm just marking down

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CAPCOM four marks here.
IRWIN Why don't you pull that strap out Dave, get it out of the way.
SCOTT Okay.
CAPCOM And Dave, give me a call when you go over towards the LCRU and Rover again. One last instruction and it's an easy one.
SCOTT Okay.
IRWIN Okay Dave, you can pull all of this out.
SCOTT Okay.
IRWIN Stow the hook out there.
SCOTT Yeh, I'll do that. Hold on to the hook till I get it all down.
IRWIN Yeah. Okay let go of the hook, I got it.
SCOTT Okay.
SCOTT Okay. . back down. You got another little . . oh, the cover bags are all out here, right?
IRWIN That's right.
SCOTT Okay, good show, I'll bring those up with me on the last trip. All right Houston, what would you like to do with our friendly Rover?
CAPCOM Okay, Dave. A few . . uh, let's see. . three easy steps, turn the LCRV power OFF, the LCRV blankets 100% open, and that's a change, 100% open and the TV is presently pointed exactly how we would like it left. Over.
SCOTT Okay, the third one is the easiest, and the second one is the easiest, and I'll turn the LCRV power off right now. But it . . there, it's off. Okay, the power's off, and the blankets are 100% open anyway, as you can probably see.
CAPCOM Roger.
SCOTT It's all tidied up for the night.
CAPCOM Roger.
SCOTT Anything else before I hop in Joe?
CAPCOM Not a thing, Dave, beautiful job all around.
SCOTT Houston, anything else before I hop in?
CAPCOM Not a thing, Dave.
CAPCOM Flight Director wants to know if you want to go drill a couple more holes.
IRWIN Sounds like you turned them off, Dave.
SCOTT Sure does.
CAPCOM Dave, can you read Houston?
IRWIN Any time Dave.
SCOTT Okay. Yeah. Wonder if I ought to go back and turn that back on and talk to him out there.

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CAPCOM Negative, negative, transmitting in the
blind.
SCOTT Yeah.
IRWIN The LCRU is in a good . . .
SCOTT Yeah, I know it, but why don't we have
comm?
CAPCOM Stand by Dave, stand by, stand by.
IRWIN That's correct.
SCOTT In the LC area.
IRWIN Its coming in.
CAPCOM Stand by, Dave, we hadn't transferred comm
to the LM. We're happy, please get on in. No further
instructions.
SCOTT Oh, okay, Joe.
CAPCOM Okay, beautiful.
IRWIN Okay, Dave's coming up now.
CAPCOM Outstanding.
SCOTT (garble)
IRWIN (garble) push this out to the right there,
Dave.
SCOTT Yeah, sure. I'm not sure I can get them
all in, so we don't have . . .

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 149:19 CDT 13:53 451/1

IRWIN (garble) push this off to the right there,
Dave.
SCOTT Yeah, they should.
IRWIN Let's make sure I can get them all in so we don't
have any hang up (garble).
SCOTT Get my antenna, Jim?
IRWIN Okay can you come in a little farther.
Okay, hold it right there. We've got to preserve one good
antenna.
SCOTT Yeah.
IRWIN Mine worked pretty good in the stowed
position.
SCOTT Sure did.
IRWIN Maybe you ought to put yours down there,
save a little time. Get it.
SCOTT No. Just take it easy.
IRWIN I'll be glad to.
SCOTT (garble)
SCOTT I (garble).
IRWIN Yeah.
SCOTT Anything I can do?
IRWIN No, just stay right there.
IRWIN (garble)
IRWIN Okay, it's stowed.
SCOTT Okay.
IRWIN Getting a little farther in, see if you
can raise up. Dave, you can start to raise up.
SCOTT Okay.
IRWIN Dave, shift a little to your right, if you
can.
SCOTT Okay.
IRWIN Forward you're hung up on my RCU.
SCOTT Oh really?
SCOTT Am I still hung up?
IRWIN Now - if you - swing to your right if you
can.
SCOTT Okay.
IRWIN There you go.
SCOTT Okay, turning around here.
SCOTT Okay, prime water closed.
IRWIN Okay, if you can get mine. Get yours?
SCOTT I think I can probably get it.
IRWIN I can get it easier probably.
SCOTT Get it then. Can you.
IRWIN Yeah, it's closed.
SCOTT Okay, can you get yours?
IRWIN No, I'm going to need you to get mine.
SCOTT Well, I'm going to have to get the door

SCOTT partially closed here. It was so much nicer outside.

IRWIN Do you want me to turn.

SCOTT Yea, you'd better, if you can. Boy you're really jamed in there Jim.

IRWIN Yep. It must be my water. (garble)

SCOTT Jim, I sure can't reach it from here.

IRWIN How did we do it yesterday.

SCOTT Turn left, can you come forward and turn left? Turn right, just turn right the way you were, maybe all the way around.

IRWIN I'm hung up on it.

SCOTT Can't really do anything.

IRWIN Come forward.

SCOTT Oh I know, go up. 2 harness on your bar. You can go up and turn right, up and turn right, yea. No, you're going to have to get your water by yourself I'm afraid until we get repress.

IRWIN Well we can repress with the water on.

SCOTT Yea.

IRWIN We'll just get a little water in the cabin.

SCOTT Have to because I'm not coming. Okay, post EVA, water closed, forward hatch closed and locked. Okay let's get that.

IRWIN I have to get unlocked here though to get around.

SCOTT I know it. Okay, let's see if I can tell, closed and locked, I think.

IRWIN You can't reach around me to get -

SCOTT You have to raise your right side up and go to your left, would be the best thing you can do. That's it keep coming, up and left, up with the right and over to your left, at a boy, good show. Yea, you're clear.

IRWIN Okay.

SCOTT Can you get the - easy does it. Go easy.

IRWIN Yea, I am. Okay. You can read to me.

SCOTT Okay, well let me, maybe I can get your water as you go forward. Can you move into the corner?

IRWIN Yea, I can rotate around to the right, Dave.

SCOTT You've got to move.

IRWIN Move which way?

SCOTT Into the corner because I can't get my arm up.

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SCOTT (garble) Now we've got it. Okay,
prime feed water is off.
IRWIN Good.
SCOTT I think.
CAPCOM Good show.
SCOTT Go around and get the hatch.
IRWIN I've got it. It's auto.
SCOTT Okay. Okay both to auto.
IRWIN Cabin repress to auto. Cabin repress
on the first one.
SCOTT Yes sir, cabin repress to auto. Okay
CB16ECS cabin repress closed.
IRWIN Cabin repress closed.
SCOTT Okay coming up. .5 3.0 4.1 Okay,
we are about there press right A and B to cabin, get them.
IRWIN Yea.
SCOTT And PLSS 02 to off.
IRWIN A and B to cabin.
SCOTT My PLSS 02 is off, cabin warning light
should be off, let me check it here.
IRWIN And my 02 is off.
SCOTT Okay.
SCOTT Verrify cabin pressure stable at 46 to
5 and we're just about 4.5 or 6 slowly coming up. Okay
use the purge valve to depress the PGA if you need to do
that, which I guess we don't. Okay, verify EVA CB configuration,
you can give me a little corner for a minute, and let me
turn around.
IRWIN Okay. Mine's verified.
SCOTT Okay. Let me take a look. Okay
mine's verified. Okay CB16 ECS suit vent number 2 closed.
IRWIN Suit vent 2 closed.
SCOTT Suit vent delta p closed.
IRWIN Closed.
SCOTT ECS caution suit lights come on.
Those should go out. Okay ECS caution lights are out.
IRWIN (garble) oh good.

END OF TAPE

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CAPCOM Dave and Jim, while you're enjoying that, stand by to copy a new EVA record. 7 hours plus 12 minutes plus 53 seconds. And I'll be prepared to sign your sporting certificates a little later.

SCOTT Oh, how about that, thank you, Joe.

IRWIN Okay, gloves off.

SCOTT Did you get them both off?

IRWIN Yeah.

SCOTT Okay, doff the helmets with visors and lower shades. And stow in the helmet bag. Oh, that feels good.

IRWIN Okay get this up.

SCOTT Okay.

IRWIN Okay. PLSS on the dump valve. AC/DC water valve to OPEN.

SCOTT The third valve water OPEN.

IRWIN Okay, remove purge val, stow to PLSS.

SCOTT Oh, ho, ho, kinda stuck, isn't it.

IRWIN Kinda stuck, it is. Got a little dirt in here. Have to work on that later.

SCOTT Yeah.

IRWIN Here's mine, Dave.

SCOTT Okay.

IRWIN Dusty. (Garbled) Okay, disconnect OPS 02 hose.

SCOTT Here's mine, Jim.

IRWIN Okay, mine's off. And uh let's see.

Connect the LM 02 hoses, red to red and blue to blue.

SCOTT If you'll wait, I'll turn around and see

if I can get -

IRWIN Okay. Maybe you're dusting off there.

SCOTT Up, up it again.

IRWIN Up?

SCOTT Put you're - it in again.

IRWIN Okay. You just got the magic touch.

SCOTT It was easy, how did you do it?

IRWIN Took it out, it was already unlocked.

SCOTT It helped to have it back that far.

IRWIN Did it?

SCOTT Yeah, yeah, you didn't have any trouble getting it off, did you?

IRWIN -- Let's go this way.

SCOTT If you don't mind, I'll have you plug mine up.

IRWIN Yeah, I thought you had it, I'm sorry.

Turn the other way, let me help you.

SCOTT No, don't, Jim.

IRWIN Want to get the (garbled) here.

SCOTT Let you turn around back into your little corner.

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IRWIN Okay.
SCOTT Now, out of my suit. Water being blown out.
IRWIN Where the water's coming from.
SCOTT Water.
IRWIN Yeah, some water's being blowing out my
helmet duct.
SCOTT You're have to back up, Jim.
IRWIN You got the water off.
SCOTT Not yet.
IRWIN Is coming out, yeah, you're right. Let me
check it.
SCOTT I think it's off.
IRWIN Whew, it sure wasn't.
SCOTT Up and off.
IRWIN Of course the rest of the program.
SCOTT Hey, you're going to have to go over here,
Jim, it won't reach you.
IRWIN No way.
SCOTT It won't reach you that way, Jim. You can
just drop it, no, no way. Turn -
IRWIN I'm coming that way.
PAO This is Apollo Control, 149 hours, 39 minutes
ground elapsed time. After 7 hour, 12 minute, 46 second EVA-2
on Apollo 15. The GO for depressurization for EVA-2 was
given at 142:13 ground elapsed time. The Commander was on
the surface at about 142:28. Lunar roving vehicle began
moving at 143:11. Heart rates throughout this second EVA
while riding ran about 84 for Scott and around 88 for Irwin.
During work periods, they ran between 90 and 108 for Scott
and 90 to 120 for Irwin. EVA-2 was modified somewhat from
the pre-mission traverse plan. The crew made their first
stop between Spur and Window Craters and later returned to
Spur, collecting samples, making pan photographs. At Spur,
at the Spur area during the work period, both the crewmen's
heart rates ran around 93 to 100. During the Spur activities,
Spur Crater activity, the BTU output, metabolic output, ran
920 BTU's per hour for the Commander, 770 per hour for the
Lunar Module Pilot as opposed to upwards of 1150 BTU's per
hour for both of them during EVA-1. The crew then drove
back to Station #4 at Dune Crater and later returned to the
Lunar Module to extend one of the heat flow experiment probes,
drilling for which was begun yesterday, put an additional
stem on it and drove it deeper. They also drilled a core
sample which will be retrieved during tomorrow's EVA-3, that
was left in the surface. They deployed the United States
flag just prior to closing out EVA-3. The Commander had
a warning tone on his PLSS to go to the auxiliary feed
water supply in his portable life support system at 148:19
ground elapsed. And the Lunar Module Pilot got a similar

APOLLO 15 MISSION COMMENTARY 8/1/71 14929 GET 1403 CDT 452/3

PAO -- signal which is audible on the air/ground as a little beeping sound, at 1:48:58. The auxiliary water supply is 3.4 pounds of water which is switched to after the primary supply of 8 and a half pounds is exhausted. During this EVA turnaround, or echo effect, was very apparent. This was caused by the fact that the Lunar Module was in a relay mode in its communication system. The uplink from the Mission Control Center here would go S-band from the earth to the lunar communications relay unit, the LCRU, in turn would convert it to VHF to go to the crew. But at the same time, the VHF signal went to the Lunar Module's VHF receiver and was converted back to S-band and relayed back to earth. Therefore, all of the CAPCOM's comments were heard twice. Repressurization was begun at 149:26; repressurization was complete at 149:27:50 for a total EVA time, at least according to the EVA clock which stopped when repress was complete, 7 hours, 12 minutes, 46 seconds. Unofficial total distance traveled by the lunar roving vehicle during EVA-2 was 12.7 kilometers which computes out to 7.87 statute miles. Among the people in the viewing room during EVA-2 were Dr. Edward David, Presidential Science Adviser, Dr. James Fletcher, Administrator of the National Aeronautics and Space Administration, his Deputy George M. Low, Dale Meyers, NASA Associated Administrator for Manned Space Flight, Dr. Eberhard Reis, Director, Marshall Space Flight Center, Dr. Robert R. Gilruth, Director, Manned Spacecraft Center, John Glenn, who was Astronaut who flew the first United States manned orbital mission - MA-6, Mercury/Atlas-6. We're estimating a change of shift press conference at 2:30 Houston time in the News Center with Gold team flight director, Gerry Griffin, and Spacecraft Communicator Joe Allen. Some additional air/ground with the final closeout and the post EVA checks aboard the Lunar Module Falcon have been recorded on tape. We'll roll those now and resume live transmission.

END OF TAPE

SCOTT Can't do it unless I take these off.
SCOTT Okay (garble) GA diverter valve,
horizontal. Suit flow remote, PLSS pump off to the left,
PLSS fan off to the left, disconnect to PLSS H20 from the
PCA and connect the LM H20.
IRWIN You've disconnected me already, huh?
SCOTT The water, yea.
IRWIN (garble) How about the water connect.
connected.
SCOTT Okay, okay, it's connected. (garble)
to 0. Okay the audio panels. Switch A to receive and B
off.
CAPCOM Falcon, Houston.
FALCON Hello Houston, go ahead.
CAPCOM Okay Davy, when you get to 86 on that
water read chart, I've got a change for you. When you can
take it, just let me know.
FALCON Okay, Richard, we'll do that.
CAPCOM You two guys really know how to impress
people, I'll tell you.
FALCON Well you know, we sure have a lot of
good things going for us.
PAO This Apollo Control at 149 hours 59
minutes. We've completed our shift handover in mission control.
At the present time Flight Director is Glynn Lunney and our
Spacecraft communicators are astronauts, Robert Parker, for
the command module, and communicating with the lunar module
at the moment is astronaut Dick Gordon. Our change of shift
press conference with the gold team flight director, Gerry
Griffin, and the Gold team spacecraft communicator, Astronaut
Joe Allen will begin shortly, and that press conference will
be in the large auditorium in building 1, and as is our custom
during the press conference, we'll be recording any communications
with the crew aboard Falcon on the lunar surface and we'll
play that back immediately following the press briefing.

END OF TAPE

PAO This is Apollo Control at 150 hours 34 minutes. We have about 3 minutes of radio communications left with the Command Module on its 37th revolution of the moon before going behind the moon, and we've accumulated about a minutes worth of tape, communications with Dave Scott aboard Falcon on the lunar surface. We'll play that tape back for you now, and then stand by live.

IRWIN Houston, this is Hadley Base.

CAPCOM Go ahead, Jim.

IRWIN Yeah, you all ready to go ahead with this battery management, it's called for at 1329.

CAPCOM Roger, we're watching you go. Now I know where you are in the checklist.

IRWIN We're trying to get through lunch time here.

CAPCOM Well, the sooner you do it, the sooner you get to sleep and we'll be very anxiously awaiting that.

IRWIN Dick, I missed your comment when we lost comm there.

CAPCOM Jim, I gave you a go-ahead on that battery, and concerning your lunch, we're anxiously awaiting you to do all that so you can get to bed. We've got a time problem as you might well recognize.

IRWIN Yeah, I understand.

CAPCOM And we'll talk to you a little bit about that when you get a chance. Okay we are looking at your batteries now and they look great. Okay, Jim, we're getting good high bit rate and we'll watch those batteries a little while.

IRWIN Houston, ED batteries both checked at 37.

CAPCOM Thank you, Jim.

IRWIN Houston, This is Hadley, I have a weight report for you.

CAPCOM Go ahead.

IRWIN Roger, SRC was 40, bag 3 was 30, bag 6 was 33 for a total of 103.

CAPCOM Copy, Jim.

IRWIN And Houston, Hadley Base again standing by for your cue to go off PCM and power amp OFF.

CAPCOM Say Jim, just give us a couple more minutes.

CAPCOM Falcon, Houston, okay, we're through looking at your batteries. You can proceed.

IRWIN Rog, Roger, we'll reconfigure.

CAPCOM Falcon, Houston, (garble) o, please.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 15049 CDT 1523 455/1

PAO This is Apollo control at 151 hours 12 minutes. It's been about 30 minutes since we last heard from Scott and Irwin on the lunar surface. It'll be about 10 minutes before we rerequire radio contact with Al Worden in the Command Module. At present time the two astronauts on the lunar surface are in the process of getting the LM cabin cleaned up and squared away for their rest period. They'll be getting out of their suits recharging the portable life support system. And eating dinner and we also have open a debriefing on the second extravehicular activity of today before we put them to bed.

CAPCOM Let me know whereabouts you are. Got some words for you before you get to PLSS recharge and the ETB stowage..

FALCON Okay, Jim's just getting out of his suit now. I'm out of mine.

CAPCOM Okay, Dave. I bet that feels good.

FALCON Yeah, boy.

CAPCOM Look on that telemetry biomed sensors since we looked at you last night you can leave that where it is in the right position and we'll look at Jim tonight.

FALCON Okay, fine. And I'll tell you the secret to living up here is getting out of these suits. It really makes the difference.

CAPCOM Yes, I believe your absolutely right. Okay, and I owe you a word on your PLSS recharge. When you have those things in that good vertical position they want you to charge that descent water for 10 minutes instead of the 5 you have on your checklist.

FALCON Okay, that's easy enough. 10 minutes instead of 5. We'll do that.

CAPCOM Okay, Dave. The only additional thing I have for you, you can just listen to this. Before you put the film away in the ETB, I've got a little word on the 16 mm stuff and also I'll talk to you about Jim's 70 mm when you come back to me.

FALCON Okay, Dick we'll give you a call as soon as we get to that point.

CAPCOM And I just thought I would let you know that you worked right through your eat period.

FALCON We were just looking at that as a matter of fact. I think we got 10 minutes left, don't we.

CAPCOM No, I'm sorry about that old friend.

FALCON By golly you're right we just went by it didn't we. Oh well, we have to skip some of the things up here I guess.

FALCON Okay, Houston Hadley Base here. We ready to talk about the ETB.

CAPCOM Dave can you hold up till we clear up the comm, please.

CAPCOM Okay, Dave this is Houston. How do you hear me now?

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 15049 CDT 1523 455/2

FALCON Loud and clear.

CAPCOM Stand by, there is more static. Okay it seems to have cleared up, Dave. On you ETB loading if you've got page 8-7 of the ETB I've got just a couple of changes.

FALCON Okay, I've got it right in front of me, go ahead.

CAPCOM Okay. Here's on the black and white mag column that has VV and WW add roger, roger.

FALCON Okay.

CAPCOM Okay, Dave. Your down quite a bit. Scratch black and white magazine mike mike. It was on the 500. Leave that onboard the LM and you can use WW which is on the next line up there for the 500 mm. Add two more 16 mm's, golf golf and hotel hotel.

FALCON Okay, so far I've added roger scratched mike added golf hotel to 16.

CAPCOM Okay, you can use WW on the 500. On this 16 mm stuff some instructions that never got up to you didn't get us until today. On those 16 mm mags the limit on advancing that film is 1 frame and there are 2 red perforations, 2 red marks, along side the window, there and if you can line up perforation hole with those 2 red marks we ought to be in business on the 16 mm.

FALCON Dick, we did that today. We knew about that. Primarily because of the split ring problem. And we made sure all along that those perforations were lined up with the red marks.

CAPCOM Okay.

FALCON We did it on the mags today too.

CAPCOM Okay, that's very good then we've done all we can with the 16 and I don't know what you've done with the Jimmy's 70 mm, but the only thing we suggest from down here if there's still - the mags still has exposures left. Play the game with the two white windows on the camera and the magazine and if that mag doesn't work try to find one that does, I guess.

FALCON Okay. We haven't had a chance to exercise it yet, but let me do everything we can figure and if it doesn't work we'll give you a call.

CAPCOM Yes, I knew you would. I just wanted to remind you of it. Would you verify the mesa heater circuit breaker open for me.

FALCON Okay, it was closed and now it's open.

CAPCOM Okay, thank you. And I guess you still have taping procedures for your PLSS and we'll call you when the VHF window comes up with Al. Further, there will be no science debriefing for you guys tonight. You did such a superb job today that we'll have very many questions down here and we

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 15049 CDT 1523 455/3

CAPCOM would like to use that time to get you gone, and get you to bed. As you can well guess we're holding lift-off time right where it is and we want you to get a good nights sleep so we're going to have to steal some time from somewhere and we're doing the best we can, we're looking at the EVA for tomorrow for you.

FALCON Okay, Dick. We know it's in good hands and we'll be standing by. We'll give you a call when we get around to PLSS recharge.

CAPCOM Okay, very good Dave. And if you - you want to talk to Al this pass.

FALCON Yes, let's say hello to Al.

CAPCOM Okay. I'll give you a call.

END OF TAPE

PAO This is Apollo Control at 151 hours and 47 minutes. In about 5 minutes the Command Module with Al Worden aboard will be coming within VHF range of the Lunar Module and the two crews plan to attempt to make VHF contact. They will be within VHF range from about 151 hours 51 minutes until about 152 hours 4 minutes, or about 13 minutes. In our last conversation with Al Worden, we got a status from him on the performance of the camera equipment and sensors and the scientific instrument module bay of the service module, and Worden reported that the cameras are functioning very well. We do have a couple of relatively minor problems at this point in the SIM bay. The boom which deploys the Mass spectrometer out a distance of about 24 feet from the mold line of the service module appears to be binding up possibly when retracted. At least we notice that when retracting the mass spectrometer on the boom, it is retracting more slowly than we would expect. Since we are not in the most favorable altitude for use of the mass spectrometer, which gathers information on the lunar atmosphere, we plan to delete extending the mass spectrometer this evening and to assure that we do have a fully operational instrument later in the flight when the Command Module will be in a more favorable attitude to obtain this kind of information. Also the laser altimeter which is used in conjunction with the mapping camera, does not appear to be providing usable altitude data. We've been observing this and we thought that perhaps when the SIM bay reached the proper temperature and the instruments there had cooled down to the proper point, that the altimeter would begin working, however, we do not have . . . are continuing to get no usable data from the altimeter and are beginning to reach the conclusion that perhaps we are not going to get laser altimeter data. This is not particularly serious, it's one very useful piece of information which we would like to have on the mapping camera, this altimeter provides an altitude reference on each frame that is shot with the mapping camera, allowing map makers, who will be working with the photographs following the mission, to determine when the precise altitude of a particular point on the photograph and from that to calculate the altitudes of other . . . other features in the photo frame. We're now about one minute away from the scheduled time in which the Command Module will reach VHF acquisition with the Lunar Module and you heard Dave Scott while ago say that he did plan to try to get in some communications with Al Worden aboard the orbiting Command Module. So we'll stand by for that.

CAPCOM Falcon, Houston. Over.

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 151:36 CDT 16:10 MC456/2

FALCON Go ahead.

CAPCOM Roger, Al is going to give you a call on Simplex Alpha about now.

FALCON Okay thank you.

CAPCOM Falcon, this is Houston. Al has been calling you.

FALCON Not ready yet. Okay, Endeavour Falcon must be on the other side of the mountain, and we're going to stand by until you get over, because you are always broken over there and everything.

FALCON Hi Endeavour, Falcon, how are you? Endeavour, Falcon, you're broken.

FALCON How's this?

ENDEAVOUR Okay, we'll wait till you get closer over here, till you get past the mountains. How are things going up there? Get lots of good data? Yeah, we are too, we're got a load of 100 pounds today. Got the side of the mountain, got a good look around, things are going real well. Oh man, it was super, just super. Got some great pictures for you. Yeah, I'll tell you, I hope you can see these Rover tracks, because outside the LM here it looks like a freeway.

ENDEAVOUR Yeah, I'll bet it does. Will you collect another bunch of rock and bring them home.

FALCON Okay, make a nice little place for them.

ENDEAVOUR Well, we'll make a place for whatever you bring home.

FALCON Okay, very good.

FALCON Hey, Al, throw my soap down, will you?

FALCON And my spoon.

ENDEAVOUR Forget something, Jim?

FALCON I really need my soap.

ENDEAVOUR Don't mind if I use it, do you?

FALCON Save me a little bit.

ENDEAVOUR Well, I haven't had a chance to use it yet, but I might tonight.

FALCON I might suggest you wait until tomorrow night (garble)

ENDEAVOUR Yeah, that's true, I guess it'll pay for us all to do that tomorrow night.

FALCON Yeah (garble)

ENDEAVOUR How are they holding up?

FALCON Very well, haven't had a bit of trouble.

ENDEAVOUR Understand the Rover is doing fine.

FALCON Yeah, the Rover is doing real beautifully. (Garble)

ENDEAVOUR Sounds great.

FALCON Yeah, it really is.

CAPCOM Okay, Al pan camera off, please.

ENDEAVOUR Okay.

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 151:36 CDT 16:10 MC456/3

ENDEAVOUR Falcon, you still there? Falcon can you read me? Over.

CAPCOM Endeavour, Houston. We still don't have the pan camera off as far as we can see.

ENDEAVOUR Roger, power coming off now Bob, sorry about that, I didn't get it turned off quite as quick as I wanted.

CAPCOM Okay. I guess that (garble)

ENDEAVOUR Rog, (garble) stand by on your call before.

CAPCOM Okay, thank you. Hey, Al, we'd like to get high gain antenna auto from you, and sometime at your convenience, you might send us down a film usage pad.

ENDEAVOUR Okay, I'll send . . I'll compile that on the way around the next time.

CAPCOM All right. Thank you.

CAPCOM Falcon, Houston. Over.

FALCON Go ahead Houston.

CAPCOM Roger, we've seen water usage in the last few minutes, can you confirm that this is a PLSS refill?

FALCON That's correct, we're 9 minutes into the 10 minute refill.

CAPCOM Roger, beautiful, thank you and we have two other items for you here. I have some liftoff times, when Jim is ready to copy, and I'd like to reinforce for your consideration, Dick's comments on sleep time. We have a hard limit down here of 7 hours when you finally crawl into the hammock till the time we can figure on your arising to start activities tomorrow. Do you understand?

FALCON Yeah, Rog, I think we

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 CST 1636 GET 152:02 457/1

FALCON Rog, I think we're making some time up. We're in pretty good shape. We're almost finished with dinner we've got one PLSS just now finishing it's recharge, suits are all stowed and we've stowed some of the rocks, so we're in pretty good shape.

CAPCOM Okay, and the sooner you can call me to say if you're in the hammock, that's fine with me.

FALCON I understand your problem.

CAPCOM We'd like you to delay turning off the laser altimeter, and closing the covers. And Falcon, Houston, over.

FALCON Houston, Falcon.

CAPCOM Roger, Falcon, and I guess we're a little gun shy, but we're still seeing some water usage, and we'd like to confirm that you're getting some good out of it, and it's not running out in the floor.

FALCON Well listen we're glad you're watching we like that and we're charging the second PLSS now and we're about 5 minutes into it.

CAPCOM Say again, Dave, you're kind of weak.

FALCON I said, we're glad you're watching, and we're charging the 2nd PLSS now and we're about 5 minutes into it.

CAPCOM Okay, very good.

FALCON Houston, this is Hadley Base, ready to copy pad lift off values.

CAPCOM Go ahead Hadley, this is Houston.

FALCON Yes we're ready to copy lift off values 38 through 41.

CAPCOM Roger. Okay, Jim, we have T38 is 151 58 58 T39 is 153 57 03 T40 is 155 55 07, T41 is 157 53 14, over.

FALCON Roger, Bob, copied 15158 58 1535703 1555507 1575314, over.

CAPCOM Roger, good read back Jim, and I think that's all I have on my list here. We'd like a crew status report sometime before you go to bed but unless you guys have a question, that's about all I have here on the ground.

FALCON Okay, our PLSS recharge is about complete.

CAPCOM Okay, copy.

FALCON Bob, this is Jim. Houston, this is Hadley Base.

CAPCOM Go ahead, Hadley. Hadley Base, this is Houston, over.

FALCON Bob, this is Jim. Bob, this is Jim calling.

CAPCOM Go ahead. Jim, this is Bob, go ahead.

APOLLO 15 MISSION COMMENTARY 8/1/71 CST1636 GET152:02 457/2

FALCON Yea, I was wondering whether you've heard from the Endeavour that's sailing through the northwest passage. It should be at point Barrow now. He said he would be try to give us a call.

CAPCOM Tonight.

FALCON Or sometime while we're on the moon.

CAPCOM Okay we've heard nothing as I know of.

FALCON Okay somehow he was going to try and come through mission control down there.

CAPCOM Okay, no, I haven't seen anything while I've been in here, and Jim you and Dave might think also that - Stand by Jim.

FALCON Yea, your transmission was cut out. Say again Bob.

CAPCOM Okay, Jim, it turns out, we do indeed have said message, which reads: We carry out our separate voyages in the spirit of Endeavour which unites people in their efforts to overcome the common tasks when confronted by the elements of sea and wind, or harsh environment of space. Hopefully, this voyage will bring the nations to work closely together as we explore beyond our planet in the name of Endeavour, and so forth, okay.

FALCON Very good, thank you for the message, Bob.

CAPCOM Okay, and another message that you guys might pause to consider is that the surgeon is going to want you to change your sponges and tapes in the morning.

FALCON Roger, we understand.

CAPCOM Okay, we'll be standing by for a call when you go to sleep.

FALCON Roger.

END OF TAPE.

PAO This is Apollo Control at 153 hours 7 minutes. We're still awaiting final word from the crew aboard Falcon, Irwin and Scott, that they are preparing to begin their rest period. At the present time, they are a little more than an hour and a half behind in getting to bed, and because of the fact that we have a fixed lift off time tomorrow, 171 hours 37 minutes 24 seconds, the time, that is lost is either going to have to be made up from the sleep period, or from the EVA. In mission Control we're planning for either contingency. The plan at the moment, is to have EVA's worked out for either 4 hours, 5 hours or 6 hours, which one is finally selected and used, will depend on when the crew gets to sleep, and more importantly, on what time they get up and get going, for the EVA. We have about 12 minutes left now before we reacquire Al Worden in the orbiting command module, Endeavour, and at the present time we show Endeavour in an orbit, 65.7 by 51.4 nautical miles. We'll continue to stand by for a word from Scott and Irwin. They're ready to begin their rest period. Prior to going to sleep, we expect that we will be getting a crew status report from them. As you heard about an hour ago, capsule communicator, Dick Gordon, at the time, advised Scott and Irwin, that we were going to delete the EVA debriefing, in order to minimize the amount of time that we cut into the rest period. Presently the spacecraft communicator here in mission control is astronaut Bob Parker. At 453 hours 10 minutes this is Apollo Control standing by.

FALCON Hello Houston, Hadley Base.

CAPCOM Go ahead, Hadley.

FALCON Okay, start your clock.

CAPCOM Beautiful, and we'd like to verify a couple of things before you go to bed, one, that you've called up the computer and then put it back to sleep, and 2 that you've changed the lithium hydroxide canisters.

FALCON Roger, both verify.

CAPCOM Roger, and do you have any crew status?

FALCON Oh yea, we're both fine, no medication, and in the sack.

CAPCOM Okay, and that was a super day today, Dave and Jim, we will wake up in approximately 7 hours.

FALCON Okay Bob thank you, we had a great time.

CAPCOM It looked that way.

FALCON (garble)

PAO This is Apollo Control at 153 hours 23 minutes. We said goodnight to Scott and Irwin aboard the lunar module, Falcon at 153 hours 15 minutes. This is about

PAO an hour and 50 minutes later than the flight plan time. We don't plan to put in a call to the crew until they've had a 7 hour rest period. Which would us about an hour and 50 minutes late getting started for preparations for the 3rd extravehicular activity. We would hope to make up as much time as possible in preparations for that EVA. At the present time, it would appear that the most likely duration for the third EVA will be 5 hours, or about an hour less than the EVA planned in the flight plan. As a contingency, or back up, we do plan to have procedures well lined out for a 4 hour EVA, and also for a 6 hour EVA, although, as I say the most likely duration for the third EVA at the moment would appear to be about 5 hours. We've just had acquisition of signal reestablishing radio contact with Al Worden aboard the command module. This will be the last revolution of the command module before Worden begins his rest period, and since we've said goodnight to the crew aboard Falcon we plan to carry any air ground conversations live with the command module. We'll tape any conversations that we have with the lunar module, although we would not expect any, and play those back shortly after receiving them. So at this time we'll pick up a stand by live for any conversations -

END OF TAPE.

PAO This is Apollo Control at 154 hours 4 minutes. Said goodnight to Al Worden aboard the Command Module at 153 hours 54 minutes, correction 15 . . yes, 153 hours 54 minutes, or about 8 or 9 minutes ago. And we last heart from Scott and Irwin aboard the Falcon on the Lunar surface at 153 hours 15 minutes which was about 1 hour 50 minutes beyond their scheduled beginning of the rest period. The surgeon reports that heart rates indicate that Irwin on whom we have biomedical data is beginning to get to sleep although at the present time he is not sleeping soundly, but the heart rates are coming down indicating that he is beginning to drop off to sleep. The fact that Scott and Irwin did get to sleep or begin their rest period one hour and 50 minutes late and this coupled with the fact that we have a rigid ingress time, time for the crew to re-enter the lunar module and prepare for liftoff and that time is about 168 hours, this coupled with the late beginning of the rest period implies we will probably have a late start to the third EVA. We do not plan to put in a call to the crew until they have had 7 hours of rest. And this would mean that we would start the EVA, start preparation for the EVA 1 hour and 50 minutes late. We would hope to make up at least part of that in the EVA preparation and our best estimate at this time is that the EVA, the third extra-vehicular activity will be shortened by somewhere between one hour and one and a half hours, starting one to one and a half hours later than the scheduled flight plan time or at about 163 hours to 163 hours 30 minutes. However in the final analysis, this will depend on when the crew, Scott and Irwin, awake and get started on their EVA preparations. In order to be prepared for any eventuality, we are planning the EVA for 4 to 6 hours or anything in between. The best estimate at this time is that it will be a five hour EVA getting started about 1 hour late. Since we do not expect any further conversation with the Command Module or the Lunar Module during the rest periods, we plan to take the lines down, should we hear anything from either vehicle, we'll play back the conversations immediately on tape and then stand by live if it appears there will be any further conversations. At 154 hours 7 minutes, this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control at 155 hours, 3 minutes. We said goodnight to Scott and Irwin aboard the lunar module on the lunar surface about an hour and 45 minutes ago. And passed along our goodnights to Al Worden in the command module about one hour ago. And have had no further communication with either vehicle. We're still about 16 minutes away from reacquiring the Command Module, which at that time will be on its 40th revolution of the moon. The heart rates, based on the biomedical telemetry data we're getting on Jim Irwin, indicate that he is resting comfortably and dozing either asleep or very near asleep. And both spacecraft continue to appear normal in every respect. No outstanding systems problems at the present time and we're getting good data from the science, Lunar Surface Science Package, the ALSEP; and all the experiments there appear to be functioning well at the present time. We're getting very good signal strength also from the transmitter on the ALSEP. In the Scientific Instrument Module bay aboard the Command Service Module, we're getting good data from the - continuing to get good data from the orbital experiments being carried there. With the exception of a couple of problems which we've mentioned previously, all of the instruments there are functioning normally. The problems are with the laser altimeter which is used in conjunction with the mapping camera, and it appears that the laser altimeter is simply not getting enough return signal - it's below the threshold, that would appear to be the case at the present time. And we're more and more coming to suspect that we're not going to get usable data from the laser altimeter. The other problem is with the mass spectrometer and it's difficult, at this point, to say whether that's a real problem or a sensor problem. Worden has reported that on retracting the boom mechanism, the retraction does not appear to be occurring as rapidly as we would expect. And on the last revolution before he began his rest period, he reported that when he attempted to retract the mass spectrometer at the end of its 24 foot boom, the indicator in the spacecraft went part way closed but did not give him a solid indication that it had retracted. He recycled the switch a couple of times, extending and retracting. And we don't, at this point, know whether the problem was with the sensor or with the boom mechanism itself. Since Worden has no way of actually seeing the extended boom, that issue is still somewhat in doubt. The principal investigator for that particular experiment elected not to attempt to deploy the mass spectrometer at the last opportunity and there will be a time later in the orbital sequence where the Command Module will be in a more favorable attitude for deploying the mass spectrometer. And the decision was made to attempt to redeploy it at that time.

PAO Again, to repeat the situation as far as the third extra-vehicular activity is concerned, Scott and Irwin began their rest period about 1 hour, 50 minutes behind the scheduled time in the flight plan. Since we have a rigid liftoff time, we do not plan to slip liftoff. And it will be necessary to have the crew back in the lunar module and beginning their preparations for liftoff at about 168 hours. With this as a kind of an upper limit then for the EVA, coupled with the fact that the rest period began late, we do not plan to awaken the crew prior to 7 hours of rest. That raises the distinct possibility that the EVA will be somewhere between an hour to an hour and one-half late getting started. This would place egress from the lunar module at about 163 to 163 and a half hours, assuming that the amount that we are behind in the flight plan for the lunar module and Scott and Irwin continues to hold at the same level it is at the present time. There is a possibility that some of this time can be made up in the preparations for the EVA after the crew is awake. There is also a distinct possibility that even though we do not plan to awaken Scott and Irwin before 7 hours, that they may themselves awake and decide to get up and get started. To cover these possibilities, we're continuing to plan for EVA's ranging anywhere from 4 to 6 hours, with the best estimate that the EVA will be about an hour late getting started. In other words - starting at about 163 hours and will last for about 5 hours. At 158 hours, 9 minutes, this is Apollo Control, Houston standing by.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 156:00:00 CDT 2034 461/1

PAO This is Apollo control at 156 hours. The Command Module has just a few minutes ago passed over the Hadley Site on its 40th revolution of the moon. Both crews are in the midst of sleep periods at the present time and the biomedical data that we have on Al Worden shows that he is soundly asleep. And Jim Irwin sleeping a little less soundly. The surgeon reports that he is at times dozing and at times perhaps just resting. We have some preliminary numbers on the total sample collected so far on the first two EVA's by Scott and Irwin. These are estimated weights based on numbers read back by the crew from the gross weights the sample plus container and the estimated net weight is obtained by subtracting out the known weights of the containers and equipment contained within them. These estimates are as follows for the first EVA a total of 28.9 pounds and for the second EVA a total of 77.6 pounds giving us an estimated grand total for the first two EVA's of about 106.5 pounds. We at the present time have good solid telemetry data from both vehicles, and both spacecraft appear to be normal. No problems at the present time. I will continue to monitor the systems on both spacecraft continuously on the LM and every revolution while the command module is in radio acquisition. We don't expect any further communications with either crew during the rest periods, and we'll have our release lines down except for periodic status reports. We are at the present time replaying the video tape of today's EVA, and that can be seen in the MSC news center. At 156 hours 3 minutes, this is Apollo control, Houston.

END OF TAPE

PAO This is Apollo Control. We're now about 3 hours away from the time we plan to put in a call to Dave Scott and Jim Irwin aboard the lunar module, Falcon on the lunar surface, and get them started for their third and final period of extravehicular activity. Scott reported about 4 hours ago, he and Jim Irwin were going to call it a day and try to get some sleep. This was about 1 hour and 50 minutes behind their regularly scheduled beginning of their rest period. And as we have mentioned, this undoubtedly will cut short the EVA, at least there is a very distinct possibility that the EVA will be shortened most likely by about an hour. Throughout the evening in Mission Control, we've been working on a series of EVA plans which we hope to have ready to present to the on coming shift, the gold team of flight controllers will have responsibility for carrying out the EVA here in the control center. These EVA plans will cover the eventualities for EVA's ranging from 4 hours to 6 hours, probably in 30 minute segments. In other words we would have a plan for a 6 hour EVA, one for an EVA that ran 5 hours 30 minutes, 5 hours, 4 hours 30 minutes and 4 hours. The total time of the exploratory period would then depend on the time that the crew awakes and completes their EVA preparations. Both spacecraft continue to remain stable. We do not have radio contact with the orbiting command module at the present time, we are about 15 minutes away from reacquiring, but during the front side passes when we've had telemetry data the command module continues to look normal as does the lunar module, and of course we have continuing telemetry data from the lunar module. At 157 hours 3 minutes this is Apollo Control, Houston.

END OF TAPE.

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 158:00 CDT 2234 463/1

PAO This is Apollo control. We're now about 2 hours 15 minutes away from the time of which we plan to put in a call to the Falcon crew, Irwin and Scott if we haven't heard from them before that time, at to being their third EVA. At the present time we have about 30 minutes before we lose radio contact with the command module. And we have not heard from either the command module, Endeavour, or Falcon since we said goodnight to both vehicles. We last heard from Scott and Irwin at 153 hours 15 minutes, and our last conversation with Al Worden was at 153 hours 54 minutes. The operation of the lunar science experiment package on the lunar surface continues to be normal for both the telemetry and the command links. A normal leveling command sequence was completed successfully for the passive seismic experiment. And the super thermal ion detector in the - is in the stand by mode all other experiments on the ALSEP are on and sending back data. In mission control at the present time we're beginning to get some of the members for the on-coming shift. The shift handover is scheduled to occur in about 30 minutes at 11 PM Houston time. We expect that if the crew is still sleeping at that time, and we do plan to allow them to continue sleeping, if they desire. The shift hand over will be in a more or less staggered process. A number of the flight controllers probably won't be coming in for an additional hour, if the crew is not awake at the flight plan time of 158 hours 25 minutes. Flight Director, Gerry Griffin will probably be coming in - in about an hour - hour and a half. So we'll have a somewhat staggered shift change here. We do not intend to have a change of shift briefing because of the staggered nature of the shift hand over. We'll continue to stand by with the release line down until we get closer to the scheduled wake up time. Should we have any conversations with the crew or any indication that Irwin and Scott are stirring and beginning to get up and get prepared for the extravehicular activity, we'll bring the line up and stand by live at that time. At 158 hours 4 minutes, this is Apollo control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/7/ GET 159:00 CDT 23:34 464/1

PAO This is Apollo Control at 159 hours. There have been no signs of activity at Hadley Base. Dave Scott and Jim Irwin are apparently still asleep and it'll be about an hour and fifteen minutes before we plan to awaken them with a call from Mission Control. At this time our best estimate as to a start time for the third EVA is about 163 hours to 163 hours 30 minutes. About an hour to an hour and a half behind the scheduled time in the flight plan, which would give us a 5 to 4-1/2 hour EVA. Most of the members of the Gold Team of flight controllers are in the control center at the present time. Flight director Jerry Griffin is preparing to take over from flight director Glynn Lunney. The Black Team will be going off now. And we're also reverting now to the dual flight director/dual CAPCOM status. Gene Kranz will be flight director for the command service module and the SIM bay activities. The command module spacecraft communicator will be astronaut Karl Henize and Joe Allen will be coming on to relieve Bob Parker as spacecraft communicator for the lunar surface activities. The command module Endeavour is still about 13 minutes away from reestablishing radio and telemetry contact. Al Worden is not scheduled to end his 8-1/4 hour sleep period until 162 hours. At 159 hours 2 minutes, this is Apollo Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/2/71, 12:37 CDT, 160:02 GET, 465/1

COMM CHECK Texas comm tech, HOneysuckle comm
tech, Houston comm tech, net 1, voice check.
HONEYSUCKLE Honeysuckle.
TEXAS Texas.
COMM CHECK Roger. Thank you.
CAPCOM Good morning, Hadley Base. This is
Houston calling.
CAPCOM Good morning, Hadley Base. This is
Houston calling. Schoen Guten Tag. (Beautiful good day.)
Wie geht's euch? (How's it going, y'all?)
SCOTT Guten Morgen, mein Herr (Good morning
my sir). Ist gut (That's good).
CAPCOM Schoen guten morgen (Beautiful good
morning) Dave.
CAPCOM And we have a beautiful day planned
for the two of you.
SCOTT Very good.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/2/71, 12:37 CDT, 160:02 GET, 466/1

PAO This is Apollo Control 160 hours
and 2 minutes. Spacecraft communicator Joe Allen has placed
a call to Hadley Base. Let's listen in.
CAPCOM And we have a beautiful day planned
for the two of you.
SCOTT Very good.
CAPCOM A beautiful good morning, Jim.
Has the sun risen over Hadley Mountain yet?
SCOTT Well, give us about 30 minutes here
and we'll take a look.
CAPCOM I wouldn't be at all surprised. And
I've got things for you to copy. I'm standing by.
IRWIN Houston, Hadley Base.
CAPCOM Good morning, Jim.
IRWIN Morning, Joe. One question for you.
When we repressed the cabin after yesterday's EVA, my water
valve was not completely off and we lost a little water out
of the sublimator during the repress. Then during the re-
charge, I noticed on the OPS water vent portion that ini-
tially there were a lot more bubbles in the flight plan
after the 10 seconds why it got down to a point there were
just a very few bubbles. I'm wondering whether there might
not be a special procedure involved with the water valve
opening. Over.
CAPCOM Jim, we copied all that we'll think

APOLLO 15 MISSION COMMENTARY, 8/2/71, 12:37 CDT, 160:02 GET, 466/2

CAPCOM about it and be back with you with an answer in a few minutes. By the way, the passive seismometer people and other people tell me that there must be somebody moving around in the LM. Is that true?

IRWIN We're moving this morning, Joe.

CAPCOM Roger. You're shaking that seismometer. And Jim, I have updates to read to you when you're comfortably ready.

IRWIN Okay. Stand by.

IRWIN Okay, Joe. I'm ready for the updates.

CAPCOM Roger, Jim. I'll start with liftoff time. T 43 when you're ready.

IRWIN Okay. I;m ready.

CAPCOM Roger. T43, 161:49:31, T44, 163:47:36, T45, 165:45:40, T46, 167:43:49, T47, 169:41:53. Over.

IRWIN Okay. Beginning at liftoff for rev 43, 161:49:31, 163:47:36, 165:45:40, 167:43:49, 169:41:53. Over.

CAPCOM Roger. Readback is correct. Contact tower when you're ready for departure. And I have LM consumables updates when you're ready for those.

IRWIN Go ahead.

CAPCOM Roger. At GET 160, RCS A 85.0, B 85.0, O2 descent 1 59.9, 2 56.7, O2 ascent number 1 99, number 2 99, H2O descent number 1 18.3, number 2 16.5, H2O ascent 100 percent on both 1 and 2. Amp hours descent 803, ascent 572. And I have a note on your descent water when you're ready.

IRWIN Go ahead.

CAPCOM Roger. Just wanted you to be aware that the descent water may show over the next few hours between 1 and 0 pounds. You will have actual usable water perhaps as much as 22-1/2 pounds. It might not be quite that much. It depends upon the measurement errors. However, we're very well aware of your water situation and it's no problem at all. We just don't want you to be alarmed if you come up with a zero reading at any time on that water. And that's about all we have for the time being. We're standing by for your crew status report. We'd like also the radiation devices this morning and I think we have a very nice traverse plan laid out for you. We can talk about that as you start to get ready. Over.

IRWIN Okay. We copy.

CAPCOM And Dave and Jim, basically the EVA is going to last somewhere between 4 and 5 hours so it will be a short EVA. I'm told that we checked off the 100 percent science completion square sometime during EVA-1 or maybe even shortly into EVA-2. From here on out, it's gravy all the way and we're just going to play it cool, take it easy, and see some interesting geology. It should be a most enjoyable day. Over.

APOLLO 15 MISSION COMMENTARY, 8/2/71, 12:37 CDT, 160:02 GET, 466/3

SCOTT Okay, Joe. Thank you. We're looking forward to it.

FALCON (garbled)

FALCON Probably want us to hit the rille for all that good rille photography.

CAPCOM Jim, this is Houston. You're hitting your mike off and on. You might be sitting on it or stepping on it or pressing on it.

IRWIN Okay. I have biomed right now.

CAPCOM Roger, Jim. I don't know if you copied. I just wanted you to be aware that your mike was being keyed on from time to time. Perhaps inadvertantly.

IRWIN We understand, Joe.

CAPCOM Jim, this is Houston. Regarding your PLSS question. Everything looks normal to us down here. It seems like there's no problem there at all.

IRWIN Roger. We copy. Thank you, Joe.

IRWIN And Joe, Dave fixed my camera lat night if you have any trouble with it this morning.

CAPCOM And I bet he fixed it with a piece of tape, didn't he?

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/2/71, 1:02 CDT, 160:28 GET, 467/1

PAO This is Apollo Control 160 hours
45 minutes ground elapsed time. The Falcon crew at Hadley
Base was wakened at 160 hours and about 4 minutes with a
call in German from spacecraft communicator Joe Allen. And
after a brief period the conversation resumed with a short
synopsis or summary of what the plan is for EVA-3. Allen
described it as being between 4 to 5 hours long, a leisurely
type of EVA, all gravy, as he described it, since most -
100 percent is of the science objectives were met in the first
two EVAs and that EVA-3 would be primarily geological expe-
dition. The crew eating breakfast at this time. Therefore,
there is little or no conversation on the air to ground.
It looks like probably around 163 to 163:30 ground elapsed
time for start of EVA-3. To get back on the timeline at
the end of the third EVA and subsequent preparations for
ascent and rendezvous. Cabin pressure in the Falcon now
4.86 pounds per square inch. All lunar module systems
appear to be normal except for some decrease in the quantity
of water aboard the descent stage. This will present no
problem in the remainder of the stay on the lunar surface.
Standing by live on air/ground with Hadley Base, at 160 hours
48 minutes, this is Apollo Control.

IRWIN Houston, this is Jim. I'm sensed
now and I'm going to put the biomed on right so you can check
on my sensors.

CAPCOM Roger, Jim. We copy that. Thank you.

CAPCOM Jim, this is Houston. We've got good
biomed data.

IRWIN Thank you, Joe.

IRWIN Houston, this is Hadley Base. We're
about to eat our prime meal for a short period.

CAPCOM Okay, Jim. We copy and we're looking
for biomed left when you do.

IRWIN Houston, 15. Back on comm. Hadley
Base checking in.

CAPCOM Thank you, Jim. We read you.

FALCON Okay, Joe. Our inventory shows that
we do not have any more color mags available. Could you
check your inventory down there.

CAPCOM Roger.

CAPCOM Hadley Base, this is Houston. We
think Jim that mag Tango Tango is on your camera in the
ETV now. Tango Tango is color. Over.

IRWIN Okay. Thank you.

IRWIN Joe, this is Jim. We confirm. We do have color
on my camera.

CAPCOM Okay, Jim. You're real fine.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 219 CDT 161:45 GET 468/1

CAPCOM Hello Hadley Base this is Houston calling.
Over.

FALCON Go ahead, Joe.

CAPCOM Roger, Jim. We're looking for a rough
(garble) on where you might be in your EVA-3 prep. We're
standing by for a true status report plus a radiation
devices and we're wondering when you might be switching
over the days biomed data. Over.

FALCON Okay. Jim is in his suit now. We could
switch over to his biomedBIOMED right now. Well stand by
it'll be a few minutes.

CAPCOM Okay, fine. Thank you, Jim.

FALCON Okay. Why don't you check Dave's BIOMED
now.

CAPCOM We got it, Jim, clean as a whistle. Thank
you.

FALCON Okay, Joe.

FALCON Houston this is Hadley Base. Do you want
to leave the BIOMED on the left and I'm going S-band
voice to voice.

CAPCOM Roger, Jim.

FALCON And are you ready for the battery manage-
ment called out at 160?

CAPCOM Stand by. Okay Falcon, we're ready.

FALCON Okay it worked. ED batteries both check
at 37.

CAPCOM Copy.

FALCON Houston this is Hadley Base. We'll be
starting EVA-3 prep card in about 3 or 4 minutes.

CAPCOM Roger, Jim. We copy that and we want to
just remind you again on the bottom of 8 dash 10 the page
in your check list there, the suit gas, the diverter valve
should be at EGRESS and cabin gas returned at EGRESS. Over.

FALCON Okay. Thank you, Joe.

CAPCOM Hadley Base this is Houston. We're still
showing the cabin gas return in cabin. Could you reverifiy
that it's in EGRESS. Please.

FALCON Cabin gas returned is presently in auto.
I think we pick it up at EGRESS a little later on in the
procedure.

CAPCOM Jim, roger. Actually we should have picked
that up on page 8-10 in your check list. So we think it
should be in the EGRESS position now.

FALCON Okay. I'm going EGRESS.

PAO This is Apollo Control at 162 hours 41
minutes ground elapse time. The crew aboard Falcon presently
donning their portable life support system and pressure
suits in preparation for the third and final Extra
Vehicular Activity period of the mission, which will last

PAO about 4 to 5 hours depending on various circumstances Mean while Al Worden was waked up during this last front side pass. Revolution 43. He was waked up at 161:59 ground elapse time with a little bit of Tiajuana Brass music being piped on the second of the two air ground circuits. Unofficial estimates on the poundage or weight of samples collected during the 2 completed EVA's run as follows and the sample return container 1, we'll use our EVA-1 numbers. Sample return container 1, 36 pounds, bag 4 15 pounds, contingency sample 2.7 pounds for a total of 53.7. Second EVA. Sample return container 2 40 pounds, bag 3 30 pounds and bag 6 33 pounds for a total EVA-2 of 103 pounds of samples. The two EVA's combined make up an estimated 156.7 pounds. We're looking at a depressurization time now, tentatively 16314 that ball park, ground elapse time. Depending on the length of time it takes to prepare for depressurization and EGRESS. The air to ground circuit with Falcon is up and live and at 162 hours 43 minutes ground elapse time this is Apollo Control.

FALCON Houston, Hadley Base. We'll be coming to you with a COM check in about 2 or 3 minutes.

CAPCOM Roger, Dave. Looking forward to it.

CAPCOM Dave and Jim this is Houston. Be advised we've got an EVA update for you, which you can copy on to the check list if you want or we can read it to you as you progress through the EVA and we can talk about that when you want to. Over.

FALCON What does it involve, Joe, and what does it concern.

CAPCOM Okay, Dave. It's going to be very simple changes to the check list. I think just a few words concern the general picture will be plenty sufficient and then we'll give you the details as you come to them. I just want to give you an idea of how the traverse is going to look before you actually get started. Over.

FALCON Okay. You mean our cub check list?

CAPCOM Roger. You're going to be able to follow your cub check list for EVA-3 almost exactly, just a few changes.

FALCON Okay. Well can we proceed on here and you want to give us the changes now? That might be better for us to proceed on out and you change us as we drive or something.

CAPCOM Okay. That sounds like the second option is a good one Dave. Although you might want the big picture before you proceed on out.

FALCON Well why don't you give us the big picture now before we get to deep in the COM check and all.

CAPCOM Okay, roger, Hadley Base.

APOLLO 15 MISSION COMMENTARY 8/2/71 219 CDT 161:45 GET 468/3

CAPCOM Taking it from the top. We're going to ask you to stop first at the ALSEP sight and spend a few minutes recovering the successfully drilled core tube and then follow that with the Grand Prix photography. From there press on towards station 9 as planned. We're going to skip the DELTA stop in between. Station 9 is exactly as we planned it. From station 9 up to station 10 exactly as we planned it and at station 10 we're going to hit a branch point. We can update you there when you arrive at station 10. The two options are basically to head north for the complex, although we think its more probable we'll just want to loop back towards the north across Alligator Chain, doing good (garble) sampling and wind at Quark West crater, that's the western crater of the Quartriplet and use that as a station 14 stop. Over.

FALCON Okay. I guess we'll proceed on to station 10 and take a look at it there. I'd sort of, would like to get up to the north complex if we can.

CAPCOM Roger, Dave. We copy that and it may well be we can get up there. We'll just see how it goes.

FALCON Okay. On with the COM check.

CAPCOM Okay.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 162:51 CDT 3:26 469/1

FALCON ... mode VOX, VOX sensitive (garble) CB 16 comm SE audio open (garble). Okay CB 16 comm SE audio closed. (garble) maintain right. PLSS mode to A, wheel counter clockwise.

FALCON Okay I'm A.
FALCON Okay. PLSS O2 pressure gage 385.
IRWIN Verified reading 94.
SCOTT Okay, you're (garble) check with Houston.
IRWIN Houston, how do you read the LMP?
CAPCOM LMP you're loud and clear.
IRWIN You're the same.
SCOTT CD11 comm CDR audio.
SCOTT CDR's to B PLSS O2 pressure gage is reading
91 percent and how do you read me Jim?
IRWIN Oh, I read you loud and clear
SCOTT Okay, did you make a comm check with Houston?
Did you make a comm check with Houston?
IRWIN No, I didn't. Houston, how do you read the
LMP.
CAPCOM Jim, both you and Dave are loud and clear.
IRWIN Okay. Okay PLSS mode LMP to B and CDR to A.
SCOTT Okay, I'm on A, how do you read.
IRWIN Loud and clear.
SCOTT Okay, Houston, how do you read the CDR on A?
CAPCOM CDR, you're five by.
SCOTT PLSS mode both to AR, turn on.
SCOTT Okay, how do you read me on AR?
IRWIN Read you loud and clear.
SCOTT Okay, Houston, how do you read the CDR on AR?
CAPCOM Dave, you're loud and clear.
SCOTT Okay, you're five by and hows the TM? Can
you make a check with Houston.
IRWIN Joe, how do you read the LMP?
CAPCOM Okay, Jim, you're five by and the TM's good.
IRWIN Okay.
SCOTT (garble) which it is (garble) as required.
CB 16 ECS cabin repress close verified?
IRWIN Verified.
SCOTT Suit band Delta P opened.
IRWIN Open.
SCOTT Suit band 2 opened.
IRWIN Open.
SCOTT Okay, verify ECS caution (garble)
In about a minute. Okay, they come. (garble) full egress
verify.
IRWIN Verified.
SCOTT Cabin gas return egress verify.
IRWIN That's verified.
SCOTT Suit circuit relief AUTO verified?

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 162:51 CDT 3:26 469/2

IRWIN That's verified. OPS is connect. (garble)
to suit disconnect. Disconnect LM O2 hoses and secure about
the PGA.

SCOTT Okay. Then come back around here.

All right I'll take care of you and you take care of me.

IRWIN Yeh. (garble) Okay, you want me to put you
on suit disconnect?

SCOTT Not yet. Why don't you come over here.

IRWIN Okay, you're on suit disconnect here. (garble)

SCOTT Why don't you put those under one of my belts.

IRWIN Yeh. Okay.

FALCON (garble) Okay OS O2 open and closed and I
depressed (garble) Okay, it's closed. VOX 12 the pins in.
Closed and locked. DG diverter valve to vertical. Okay
(garble) wait a minute. Okay, let's disconnect that
(garble) again. You're strapped. Able connect to ES.
Disconnect and that's locked. Okay (garble) AUTO.

FALCON Okay, it's connected and locked. Okay and
your PGA converter belt should be vertical.

FALCON Right.

FALCON Okay. Okay last drink.

FALCON (garble) as far as we possibly can. That's
going to come out with the ETB. (garble)

FALCON Okay. Is your water valve closed?

FALCON There's water going through it now.

FALCON Okay, position of mikes. And helmet (garble)

PLSS fan to ON. to the right. (garble) clear. (garble)

FALCON It's clear. Down hill but your LEVA/s check
the drink bag position.

FALCON Okay, let me get your's here. (garble)

FALCON There we go. Hose (garble) Okay LEVA's -
that one's secure. You're right.

FALCON Thank you. (garlbe) How about that.

FALCON Okay.

FALCON Okay. Secure (garble) all straps to LEVAs.

FALCON Okay, let me get yours. There's the right one.
Left one. Okay.

FALCON Very good. (garble) cold.

FALCON Okay. Get back in your corner.

FALCON Okay. CB 16 ECS LCG pump open?

FALCON Open.

FALCON Disconnect the LM water hose connect the PLSS
water hose.

FALCON VOX connected to (GARBLE) connected to
(garble)

FALCON I'll have to wait 'til you turn around here.
Coming back as far as you can?

FALCON Yeh.

FALCON (garble) still secure.

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 162:51 CDT 3:26 469/3

FALCON Yeh.
FALCON Okay, let me back.
FALCON Okay, verify the following.
FALCON Turn around and we'll check all that stuff.
FALCON Okay. I'll read to you, okay.
falcon Helmet and visor alined and adjusted.
FALCON Okay, they're alined and adjusted and locked.
02 connectors three?
FALCON Okay, locked. And that one's locked and I'll
put these on.
FALCON That one's locked and I'll but these on.
FALCON Okay. Purge valve.
FALCON Purge valve is locked, closed.
FALCON Water connector.
FALCON Locked.
FALCON (garble) connector.
FALCON Locked.
FALCON And diverter valve vertical.
FALCON Vertical.
FALCON Okay, helmet and visor alined and adjusted.
falcon Okay.
FALCON 02 connectors 3 locked.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 CDT 3:41 GET 163:07 470/1

IRWIN Mark down connector. Mark diverter valve
vertical.
SCOTT Okay, visor line unadjusted.
IRWIN Okay.
SCOTT Both cam connectors three lock.
IRWIN Let me get the (garble) even.
IRWIN (garble) on all of them connected
SCOTT Yes, you're right. Okay, and burst push valve
locked.
IRWIN Lock bar connector locked. Bar connector
locked.
SCOTT Coult you get the vertical valve vertical.
IRWIN (garble) Dave.
SCOTT Okay.
IRWIN Okay, you're locked. That's vertical.
SCOTT Okay, verify these CB configurations.
IRWIN Okay, David, put on your gloves.
SCOTT Your other glove, here on your left, Jim.
IRWIN Okay, thanks. (garlbe)
SCOTT (garble)
SCOTT Jim, my circuit breakers are verified.
IRWIN And mine are verified. (garble)
SCOTT (garble) Final test.
IRWIN Yes.
SCOTT (garble) locked
IRWIN (garble).
IRWIN And mine are locked.
CAPCOM Dave, this is Houston. How do those
gloves feel today?
SCOTT Gee, I don't know how to answer that Joe,
Sure be nice when I get through with the drill and I can
take off the over gloves.
CAPCOM Roger. Was wondering if you're going to
shoot a little pool today, with Colorado Fats there.
SCOTT Joe, today's the day for a little pool.
CAPCOM I was thinking the same thing.
SCOTT Okay, let's verify watch and the gloves.
IRWIN Okay, I'll verify yours. Okay, your's
are locked and locked.
SCOTT Okay.
IRWIN Covers over.
SCOTT Okay. Diverter on LM verified.
SCOTT (garble) (garble) Jim.
IRWIN Verified.
IRWIN Okay, verified.
SCOTT Push pump on to the right.
IRWIN Pump coming on.
SCOTT Mine's running and
IRWIN Same.
SCOTT Press (garble) B to EGRESS.
IRWIN A and B are EGRESS.

SCOTT Okay, with the push OQ on we'll do a pressure temperature check.

IRWIN Find that little valve down there.

MIO 2 is coming on.

My (garble) O2 is on. And pressure line should clear 3 1 to 3 4. Temperature gage should come up to 3 7 to 4 0. Am coming up. Okay, I'm off the peg.

SCOTT Jim, read the 3 8.

IRWIN Okay, I'm coming. Here we go, 36 7 8.

SCOTT Okay, I'm stabilized. My O2 (garble) is clear. If you can get a hold of that little bell again lets turn them off and get a (garble) check.

IRWIN Okay.

CAPCOM And, Houston marks one minute, and you have good pumps.

SCOTT Mine's off now.

IRWIN And mine's off.

SCOTT Okay, thank you Joe. Give us a call in a few minutes.

CAPCOM One minute mark.

SCOTT Okay. I'm reading 3.75.

IRWIN I'm reading 3 7.

SCOTT Okay. (garble)

SCOTT Okay, O2 back on.

IRWIN Coming back on.

SCOTT Okay, verify the O2 flag is clear.

IRWIN Mine's clear.

SCOTT Okay, let me turn it off. Can you move forward Jim.

IRWIN Yes.

CAPCOM And Hadley, base, we're ready for depress, 2 magnificent suits.

SCOTT (garble)

CAPCOM Good.

SCOTT (garlbe) may have to change his cord.

SCOTT Okay. got to go for the depress CB 16

ECS cabin wing pressed to open.

IRWIN Stand by.

IRWIN Open

SCOTT Cabin repress valve to close.

IRWIN Cabin repress valve closed.

SCOTT Now, test in the - over to forward dump valve opened at auto at 3 1/2.

IRWIN Dave, stand by.

SCOTT Okay, I've got my eyeball on the pressure gage, go ahead.

SCOTT Okay.

IRWIN You're going open now.

SCOTT Okay. 4 5 4 0 Mark to the auto.

CAPCOM Houston marks it.

SCOTT (garble)

IRWIN Verify cuff gage just dropped below 4 6, I'm looking at 5 1.

SCOTT I'm looking at 5 5.

IRWIN LM suit pressure locked up at 4 5.
 IRWIN Okay. (garble)
 SCOTT Watch.
 SCOTT Overhead dump valve to open.
 IRWIN Okay. I'm going open. Open.
 SCOTT Okay. Stand by for (garble) 1, 2, to 17.
 IRWIN Cabin is down to about 2 2.
 SCOTT (garble) come back around.
 IRWIN No. I think it will (garble)
 SCOTT Yes.
 IRWIN Why don't you wait (garble)
 SCOTT Cabin is to 1 zero.
 IRWIN Terrible.
 IRWIN Want to (garble)
 SCOTT Okay.
 SCOTT Wait 5 on the count off.
 SCOTT Okay. If you can move forward Jim?
 SCOTT I can get back in here.
 IRWIN I'm working toward you.
 IRWIN Gee, I'm in a corner.
 IRWIN Get mine.
 SCOTT Okay, here you are.
 SCOTT Make it?
 IRWIN Nope. Not yet.
 IRWING Here, I'm going to let the cabin go down
 some more.
 SPEAKER Gee, it's crowded (garble) here.
 SPEAKER There we go.
 SPEAKER (garble)
 IRWIN Ice pellets.
 SCOTT Okay.
 IRWIN (garble) (garble) I'm down to auto.
 SPEAKER Can you get that one?
 IRWIN I'll move back (garble)
 IRWIN Don't close the door. Can you hold the door
 until I get out? I got it now.
 SPEAKER Change back to auto.
 IRWIN Okay.
 SPEAKER Oh, wait a minute. You've got to leave
 it in, open.
 SCOTT That's right it's all arranged in here.
 IRWIN (garble) Yeah.
 SPEAKER Sorry about that.
 CAPCOM Houston confirms. Leave it open.
 IRWIN Open down hatch.
 SCOTT Okay, now. Push primary ladder to open.
 IRWIN (garble) that works.
 SCOTT Okay.

IRWIN (noise)
IRWIN (garbled) mine's OPEN. (garbled) mine's OPEN.
SCOTT TH 2 Flashing. Clear in 2 4 minutes.
IRWIN (garble) the breaks.
SCOTT Mine is too.
CAPCOM COMM Control Tech. ComCom.
SCOTT Okay, verified PGA 37 to 46 and mine's at
about 4.2.
IRWIN Mine's 4 1.
SCOTT Okay, caution lamps are (garbled) ECS.
SCOTT Except for Apollo lights are on.
(garble) EV visor.
IRWIN How do we go?
IRWIN How's the PLSS look down there to you, Houston?
CAPCOM They both look good. Hadley base and Dave, you
can have your diverter valve.
SCOTT Oh, Thank You Joe. Okay Jim, I'm going to get
over here and open the door.
SCOTT This should have hung on Jim.
IRWIN Just a minute
CAPCOM And Jim; diverter valve is yours as well.
SCOTT The Switcher. Okay, Standby.
IRWIN Let's see if I can turn around here Dave.
SCOTT Okay.
SCOTT Bed behind me.
IRWIN Say again.
SCOTT If you can turn right; I'm turning left.
IRWIN Okay. That's right. It doesn't matter.
IRWIN Turn that (garbled) Turn the other way.
SCOTT Am I pushing against you?
IRWIN Yeah; you sure are.
SCOTT I'll have to turn the other way then.
IRWIN Don't go back in your corner. Maybe I'm onto
it now.
IRWIN Are you back in your corner?
SCOTT Yeah. I'm back here as far as I can.
IRWIN Okay. All Clear. Doors open all the way.
SCOTT Hit my foot, I guess. Can you press? (garble).
IRWIN Stand up over there. There, Okay.
SCOTT Before you go out though, let me turn around
so I can watch you.
IRWIN Okay.
SCOTT How are you doing?
IRWIN Oh, I'm okay. Where are you?
SCOTT Oh, I just got my feet out.
IRWIN Okay, let me turn around the (garbled)
SCOTT I'm not sure you can.
IRWIN Go ahead. I'm all right. Then
you can turn around easier when I get to, to where you get my
antenna.
SCOTT Oh, Okay. I'll just stay over here in the
corner then.

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 163:23 CST 3:57 MC 471/2

IRWIN (garbled) -- one Dave, shoot I'll get your antenna when we get down to surface.
SCOTT Okay, I'm out.
IRWIN Okay, now turn around.
IRWIN (garbled) See the rope cover on the outside back channel? You might cover that it's open.
SCOTT Okay.
IRWIN Stay there on the porch until I get all the gear out to you.
SCOTT Oh yeah, like the jet bag and
IRWIN Yeah.
IRWIN How you doing?
SCOTT Go easy.
IRWIN Look that comm cord of your's has hung up on me.
SCOTT No.
CAPCOM Jim, this is Houston. Could you verify for us please, that one of the 2 dump valves is OPEN?
IRWIN Yes, the forward one is OPEN, Jim.
CAPCOM Sounds good Jim. Thank you.
SCOTT Okay. Send her in.
IRWIN I'm out now get (garbled)
SCOTT It's the World's biggest Jet Bag.
IRWIN Stand above DTB there ----
SCOTT Standing right by.
CAPCOM And Dave, while you're waiting. A word about the Polar Metric Filter. We are going to ask you to pick that up from the MESA and put it on your camera from the very first. We've got a dandy spot for you to do some Polar Metric Photographs later on.
SCOTT All righty.
SCOTT Okay, I'm heading down Jim. I don't see the (garbled) Sea out there. Where is it, down on the surface?
IRWIN A, no; it's over here on the right.
SCOTT Okay; listen, when you go down there, remember that LCRU battery is in that footpad.
IRWIN Roger.
CAPCOM Good thinking, Jim
IRWIN Get down, (garbled)--I'll get your a.
SCOTT Disc. Oh, it's in the checklist somewhere.
IRWIN Sure.
SCOTT Okay, if your clear, I'll come down.
IRWIN Yep. Clear.
SCOTT Okay. Well, It's nice to be outside where you can stretch a little bit.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/2/71, 4:07 CDT, 163:32 GET, MC472/1

IRWIN The hatch is closed, Joe.
CAPCOM Okay, Jim. Thank you.
SCOTT And Joe, the LCRU power is going to
internal now.
CAPCOM Okay, Dave. And could you check the
LRV bat covers closed at the same time.
SCOTT They're open and I will close them
now.
CAPCOM Roger. Those automatic devices fails
us every now and then.
SCOTT Yes. I recon that's affirm. Okay.
They're closed.
IRWIN Okay, Joe. I'm on the surface.
CAPCOM Roger, Jim.
IRWIN Come over and get your antenna, Dave.
SCOTT Okay.
IRWIN Although it doesn't appear like you
really need it.
SCOTT Sure doesn't does it?
IRWIN Why don't we just leave it there.
SCOTT Okay. If we have marginal comm, I'll lower.
IRWIN Yes.
CAPCOM Roger. And you're both loud and
clear.
SCOTT Good.
IRWIN Did you give the LCRU battery already,
Dave.
SCOTT No, I haven't.
IRWIN You're supposed to get that.
SCOTT Yes. I know it. Glad I reminded
you. I'm being down here.
IRWIN Reminded me of what.
SCOTT It was in the disc footpad instead
of the plus Y.
IRWIN Oh, okay.
IRWIN I'd be a little dirty.
SCOTT Really.
IRWIN Brush it off.
SCOTT Okay, Houston. Into the CDR's footpan
goes mag Union. And we got a little bit on November so we
brought that along. Organized here. The LMP's camera with
Tango.
CAPCOM Roger.
SCOTT (garbled) camera with Sierra.
Mag Romeo and mag Whiskey which I'll put on the 500.
SCOTT And I'll check it out.
SCOTT Okay. I'm sorry.
IRWIN Okay, Joe. I have a BSLSS bag out.

APOLLO 15 MISSION COMMENTARY, 8/2/71, 4:07 CDT, 163:32 GET, 472/2

CAPCOM Okay, Jim.

CAPCOM And Dave and Jim, we'll lose comm here perhaps. However, we'll get it back when the batteries change so don't worry.

SCOTT Okay. Understand, Joe. And into the ETB go 16 millimeter H, Hotel, Juliet and Golf. Item, and we'll put boxtrot on the camera.

IRWIN Dave, I'm going to stand up on the Rover. Get the BSLSS bag locked.

SCOTT Here. Maybe I can reach it, Jim. Let me try it.

IRWIN I can reach it. My arms are longer. Just a second. Okay. I'll give you your maps so you can put them on.

CAPCOM Dave, a reminder to pick up the polarametric filter when your at the mesa.

SCOTT Thank you, Joe.

IRWIN Down a little bit. It's hard to get into the lock, Dave. I think - if you have any difficulty just let me stand up. I can lean over and get it. Down. We have to swing that lock on the left side forward to lock it in there.

SCOTT Oh, yes. I'm not sure you're going to get to that at all.

IRWIN I could get it if I could stand up and lean over.

SCOTT You can try. Be careful.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 417 CDT 163:42 GET 473/1

SCOTT Okay, Joe, I have the Polarmetric filter.
CAPCOM Okay, Dave, and just plug on to your camera at your convenience. You'll want to change the exposure time to 1 over 125 and you might call out the filter position.
SCOTT Okay. Let me get to it later, Joe.
CAPCOM Roger, no hurry.
SCOTT Is that the BSLSS on the, just to the left side or right. No it is, I see it.
IRWIN Upsight.
SCOTT Up. I can get it.
IRWIN What?
SCOTT I can reach that? Can you reach around the, if you want I could get it. Can't reach the strap the bag's to wide.
IRWIN Up or down?
SCOTT Forward.
IRWIN It was already in forward.
SCOTT Must have got it. Now it's got go aft, Jim.
IRWIN It's easy to lock.
SCOTT Here I'll hold the bag back and you just aft. Push aft.
IRWIN If it's aft, no sweat, Dave. Just leave it there. I'll push it aft.
IRWIN Let me work on it. You've got other things to do.
SCOTT Will do.
IRWIN I think I can see what the problem is. It is forward.
SCOTT (garble) that's right. (garble)
IRWIN (garble) question, Dave, let's put it under my feet, rather than lose it.
IRWIN We're not going to lose it in here.
CAPCOM That sounds good (garble) Jim. It's not worth the trouble.
IRWIN Yes.
SCOTT Here I'll get it. It's locked.
IRWIN Okay, Joe, I'm going to change the LCRU battery.
CAPCOM Roger. Just in time.
IRWIN (garble) Joe we have bag 7 on the left hand side of the tool carrier and bag 2 on the right side.
CAPCOM Jim, we copy that. If it's easy to do just keep bag 2 under the seat and follow your check list normally. Bag 2 is just an extra bag for us.
IRWIN We still have some tools in bag 2, Dave, I'll just leave that bag there and put bag, our last collection bag under my feet. Okay.
SCOTT Why don't you tell them when I come back up here.

APOLLO 15 MISSION COMMENTARY 8/2/71 417 CDT 163:42 GET 473/2

IRWIN Yes.

CAPCOM Dave and Jim do you read Houston?

SCOTT LCRV is on internal. Blankets are 100 per cent open.

SCOTT Get new sample collection bags for us, Jim.

CAPCOM Jim this is Houston. We prefer bag 2 under your seat shelves and bag 7 on the hand tool carrier instead.

IRWIN Bag 7 is Dave's bag. It's on the left side. It's just the question of which one you want on the right side. Or which one do you want on me?

CAPCOM Jim, Bag 8 on the right side please and that's a new bag.

IRWIN Okay you want bag 2 under the seat?

CAPCOM That's right exactly and then we can follow the check list exactly from here on in.

IRWIN Okay. Well bag 2 is under my seat (garble) Dave's equipment. I'm putting bag 8 on the right side of the tool carrier.

CAPCOM Right on.

IRWIN We've got a lot of sample bags, Dave, I'm going to put the extra ones under my seat.

SCOTT Okay, good idea.

CAPCOM Dave, what was the source of the battery you just plugged in for us?

SCOTT I knew it was, it came out of the LMP's (garble) where I picked it up. The one that was in the plus V foot pad.

CAPCOM Okay, Dave. Thank you.

IRWIN Dave you're going to go out to the ALSEP then?

SCOTT Yes, I guess we're both going out there.

IRWIN Okay then let me meet you out there. Are you all done.

SCOTT Yes, I'm done here.

IRWIN You haven't got the tools on.

SCOTT How could you be done. (garble) okay.

CAPCOM Dave, before you get on the Rover. We need a reading from the meter on the LCRU Please.

SCOTT Sure Joe. Stand by. I'll get that.

CAPCOM And we're asking because we may have a philly battery on our hands. We've got good TV picture, but the voltage is not quite up to par.

SCOTT Alright. Maybe I should of put it in the sun instead of the shade.

IRWIN Let me got take a look at that Joe.

Wait. Oh gosh let's get dressed up here first.

SCOTT Yes, I'll stand by here.

IRWIN Dave, take a look at this here.

SCOTT Okay Joe. What reading would you like?

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CAPCOM AGC first, Dave.
SCOTT Alright. 3.4.
CAPCOM Copy. Now we need power.
SCOTT Okay. I guess you want all three that saves
us some transmissions.
CAPCOM Go ahead.
SCOTT Temperature is 2.0, the power is 1.0.
CAPCOM Okay Dave we copy. Thank you. And Dave
and Jim as you move out to the core sight we're going to
ask you, Jim, just to help Dave with the core removal.
IRWIN Oh good.
SCOTT Good. That shouldn't take him more than
a half an hour. I might just let him do the whole thing.
He needs some experience.

END OF TAPE

IRWIN Okay, the (garble) are out. Bammers on.
SCOTT Are they capped?
IRWIN Okay.
IRWIN There wait a minute here.
SCOTT Do you have another cap?
IRWIN The other one capped?
IRWIN This one doesn't fit.
SCOTT Doesn't fit?
IRWIN Doesn't fit.
SCOTT Yeh, I thought they'd have another one under
my seat.
IRWIN Okay. Won't go on at all.
SCOTT You can move that one.
IRWIN Yeh.
IRWIN There, that goes on okay.
SCOTT Just a minute, I'll be right back there.
This seat's hung up a little bit.
IRWIN Okay. If you'll turn around I'll get -
SCOTT This bag on me first. Put this bag on me so
I'm configured.
IRWIN Yeh. I will. Use bag number 8, I'm just
closing the top on this one. Right out here a little ways.
IRWIN There you are. Just a minute. Stiff new
bag.
IRWIN Curse you stiff new bag. Come on.
CAPCOM Jim, when it's convenient for you I guess
we're going to need Dave's PLSS antenna deployed.
SCOTT Okay.
IRWIN Can you move away another step, Jim bend over
a little more.
SCOTT Okay. Phew, that bag is all folded up so
much can't get to it. Now you can get my antenna.
IRWIN Okay, I'm deployed.
IRWIN Okay.
SCOTT My bag. Tops not closed.
CAPCOM Dave, while you're getting buttoned up there,
when you go out to the drill site we'll want you to photograph
the collapse material in the trench and do a photo
pan around the core there and Jim, maybe you can see if
maybe you can pull the core out of the ground while Dave's
doing that and then he'll give you a hand.
IRWIN Okay. You're secure there, Dave.
SCOTT Okay. And let me talk you into pulling that
core out. I think we finally figured it out last week how
to do it.
IRWIN One thing Dave, before you leave.
SCOTT What? Yeh. Get my camera.
IRWIN I've got the color.
IRWIN I know it.
CAPCOM Good thinking, Jim.
SCOTT He's always thinking.

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CAPCOM Ain't he though.
IRWIN Okay, Dave, here we go.
SCOTT I'll meet you out there.
IRWIN Okay.
IRWIN I hope you took a couple because the first one
was probably exposed.
SCOTT Oh, by the way, why don't you put this mike
on here. I hate to tell you we forgot to do that.
CAPCOM Dave, this is Houston. When you climb onboard
the rover do not push in the NAD circuit breaker. We'll
do the initialization out at the drill site.
SCOTT Okay. Pull out the NAD circuit breaker.
CAPCOM Roger.
IRWIN We got mag fox. Mag fox on the 16.
CAPCOM Got it.
SCOTT Joe, there's so much dust on the camera that -
by the way, Jim, let me get your camera lens while we're
at it. I can't get the polymetric filter on right now.
I'll work on that.
CAPCOM Roger, Dave. We copy and it's worth only a
few seconds try.
SCOTT Okay. Too bad because it just won't go on.
It's such a tight tolerance on that thing any way.
CAPCOM Your objective Dave, if it's not going, give
it a toss.
SCOTT Well, I think maybe it's so sticky I can -
when we get to where we need to do it why maybe I can just
stick it on there, cause it's sticking pretty good.
CAPCOM Okay.
IRWIN Maybe I can hold it on for you Dave, it'll
be a little easier.
SCOTT It's not going to help any, Jim.
SPEAKER Okay. I've got the lens brusher, if you want
me to clean your lens.
SCOTT Yeh.
IRWIN Okay. Head for the site.
SCOTT Okay. I'll meet you out there.

END OF TAPE

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SCOTT Okay.
IRWIN It's the same.
SCOTT Yes. I'll meet you out there.
IRWIN Okay. Now the circuit breaker is open.
SCOTT Forgot the TV.
SCOTT (garbled)
CAPCOM Thank you.
SCOTT Tv camera is positioned. Circuit
breaker is coming in.
CAPCOM Roger. And nav circuit breaker should
be out.
IRWIN It's out right.
IRWIN Okay. Go.
CAPCOM Dave, when you get out to the side
if you'll park down Sun we'll give you nav alinement when
you get ready to go.
SCOTT And we're rolling.
CAPCOM Roger.
SCOTT Everything is working today.
CAPCOM Beautiful, Dave. And did you copy
park down sun, give us the readings and we'll aline the
nav system when you press on toward station 9.
SCOTT Okay. Understand, Joe.
CAPCOM Dave, while you're driving there,
we're going to want you to take apart our core stands.
We'll have Jim pack them away in bag 2 which is under his
seat and then we'll do the grand prix photographs before
we start driving off toward station 9.
SCOTT Okay. Understand.
SCOTT Wait a minute, Jimmy. Let me - I'm
going to back up a minute, Jim. Okay.
IRWIN Yes.
SCOTT Saw them before, huh?
IRWIN Not a (garbled) down is it?
SCOTT Sure is. I never saw it do that.
Oh, now I know why. No. Okay. You're moving forward.
IRWIN Kind of dug in there.
SCOTT Yes, it sure did didn't it? - - Seen
that happen.
IRWIN Trusty old rover.
SCOTT Get us going down sun here so I can
get those nav readings.
SCOTT Still got to get in position so I
can do my tricks with the drill.
SCOTT Okay, Joe. I'll push in the nav
circuit breaker. And the sun shadow device is reading about
1/2 to the left, pitch is reading about 2 down and roll -
Jim, let go back there a minute. Roll is reading 2 left.

CAPCOM Copy, Dave.
SCOTT Okay. Now to the drill.
SCOTT We last left our friend -
IRWIN Now it's our friend.
SCOTT Yes, it is. And if you could (garbled)
IRWIN Okay. Check me out on it.
SCOTT What should I do there.
SCOTT The object is to pull it out of the
ground. But I'm not sure we can do that without driving a
drill.
IRWIN I don't think so either. Why not
just drive a little bit to make it loose.
SCOTT It's broke loose.
IRWIN Oh.
CAPCOM Dave and Jim. This is Houston. We're
standing by for Rover powerdown and TV remote.
SCOTT Okay, Joe. I didn't know you wanted
the TV out here too.
IRWIN Okay. Dave you - dig down some posi-
tion for this.
SCOTT Bad one for the old earth but I'll
do it on the AGC. You ought to have it Joe.
CAPCOM Okay. Thank you, Dave. I appreciate
that and by watching maybe we can give you a few words of
advise on this drill.
IRWIN Dave, I'm thinking maybe if you get
on one side I'll get on the other. Maybe the two of us,
by hooking an arm onto that, can lift it up.
SCOTT Okay. Let's try it.
IRWIN Okay. You say when.
SCOTT 1, 2, 3. 1, 2, 3.
IRWIN A little bit. Let me get a - get
this down a little bit.
SCOTT I'd like to get down and get a -
but it's got a long way to go.
IRWIN Yes. I know it.
SCOTT 1, 2, 3,. Okay. 1, 2, 3. Okay.
That's enough. Hold it. I suspected as much. Joe, do you
think - looks to me like the only answer is going to be to
back it off with the drill.
CAPCOM Roger. Let's do that.
SCOTT Okay.
SCOTT The treadle was going to go.
IRWIN Now watch the treadle.
SCOTT I knew it.
IRWIN Do you want me to push it - can I
push it down and stand on it.
SCOTT No, no, no, no. There's another -
the other problem is you've got the break it. I guess we

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SCOTT could pull the whole - -
IRWIN Pull the whole thing out huh?
SCOTT - - thing out and put it up on the
vice and take it apart.
IRWIN Yes.
CAPCOM Sounds good.
SCOTT That's about the only way we're going
to do it. Now we got to get back down. That will do.
SCOTT Turn it around and stand -
IRWIN Stand clear of the treadle.
SCOTT Can't stand clear of it because -
should have left the treadle down there.
CAPCOM Dave, this is Houston. Is the treadle
on the ground now?
SCOTT Hey, Joe. Stand by will you?
CAPCOM Okay. We're standing by.
SCOTT We're trying to (garbled) this thing
and if we get hung up we'll let you know and we'll give you
progress. If you keep asking questions, we got to stop what
we're doing and talk to you.
CAPCOM Roger. We understand. No problem
SCOTT I know you're anxious but I guess
we've had as many hacks at this drill, we'll ask you if we
get hung up.
SCOTT Now. Sucked me right back down.
SCOTT That was a good idea, but - -

END OF TAPE

SPEAKER (garble)
 SCOTT Woo (chuckle) set me right back down.
 (chuckle). That was a good idea, but that didn't work
 either. (chuckle) What happens, Joe, is when I turn the
 drill on the drill, drill., like all drills should.
 IRWIN There you go Dave. Full angle, I was
 going to suggest that.
 SCOTT Oh brother, I think you broke it lose.
 IRWIN Let's see I've got a flag. I'll be
 a toad, no flag.
 IRWIN 90 percent of the oxygen.
 SCOTT Everything else, okay?
 CAPCOM Looks good to us Dave. Might check
 your cuff gage.
 SCOTT See if we can get (garble).
 IRWIN Yeah, David, it's okay.
 SCOTT Let me get an elbow under it.
 IRWIN I've got another (garble)
 SCOTT I don't think it's worth doing, Jim.
 We're not going to get it out.
 SCOTT I can put a lot of pressure under it
 this way.
 SCOTT (garble)
 IRWIN Okay.
 SCOTT 1 2 3, here it comes. 1, 2, 3. (sigh).
 IRWIN How many more do we have?
 SCOTT 1, 2, 3. (sigh). Now we're making a
 little progress. Tell you what we're going to have to
 do. Disbrake the drill. Take the drill off. And then
 break the stems off one by one here, and put the drill
 back on and pull it up again. Are you guys not interested
 in this thing. In Houston.
 IRWIN I'll get the wrench.
 SCOTT Yeah, get the wrench.
 CAPCOM Dave, How many inches has it moved up-
 ward.
 SCOTT We've got it up about 3 feet. And I
 think we can do it beastly if you're really that interested.
 CAPCOM Roger. We copy.
 SCOTT (garble).
 SCOTT Okay, you're sure in best with an awful
 lot in this thing.
 SPEAKER (garble).
 IRWIN You don't think there any chance of
 us pulling it all the way out, Dave?
 SCOTT Well, let's try again.
 IRWIN If we could just get our shoulder under
 that.
 SCOTT Okay.
 IRWIN Let me get down here and get a shoulder
 under it.
 SCOTT Okay, Jim. (garble)
 IRWIN (garble) you ready.
 SCOTT Nope, wait a minute.

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SCOTT 1, 2, 3. Woops, slipped off.
IRWIN Wait, maybe you can get an arm under it there.
SCOTT Okay, go. (garble)
IRWIN Oh, this is like isometrics.
SCOTT Yeah, okay.
IRWIN 1, 2, 3.
SCOTT Okay, one more. That's too hard for me
I think I can grab it here.
IRWIN Okay. You tell me when.
SCOTT Okay. 1, 2, 3. 1, 2, 3. We (garble)
SCOTT Wait, easy, easy, easy, don't order it,
just hold now. Don't bend it.
SCOTT I'll never get apart. 1, 2, 3. 1, 2, 3.
It's stuck there.
IRWIN Let's take a break.
SCOTT Yes.
SCOTT Why don't you go to max cooling.
IRWIN Yeah, just thought of that.
IRWIN Joe, you having trouble with your TV?
CAPCOM You better believe.
IRWIN It is hung down.
CAPCOM And Jim, why don't you take a breather
and tip it up for us, please. Thank you.
IRWIN It's tipped up for you.
SCOTT Nothing like a little PT to start the day
out.
SCOTT Try it again, here.
SCOTT Okay. Go ahead. 1, 2, 3. Okay, it's
coming, it's coming.
IRWIN Okay, we've got it up even here.
SCOTT Okay, 1, 2, 3. (chuckle). Okay, one
more, 2, 3. Okay, I've got it.
IRWIN Okay, let me have it now.
SCOTT Okay, you've got it.
IRWIN Now if you'll close the gate.
SCOTT Okay.
SCOTT It's closed.
IRWIN Okay. Can you pull up the vise here?
SCOTT No. Just leave it alone.
IRWIN Okay. It's up.
SCOTT You're going to have to help me pull it,
Jim, it's pretty heavy.
IRWIN I thought you did too.
SCOTT It's a two man job.
SCOTT Okay. 1, 2, 3 up, there we go. We almost
flew with it.
IRWIN I've got it.
SCOTT Okay.
IRWIN Man oh man.
SCOTT Here let me see, I'll get the caps for
that.
IRWIN It's in bag two, I think.

SCOTT Yeah.
SCOTT Put all the stuff back here if you can.
And I can just work the problem right here.
IRWIN Okay.
CAPCOM Jim, all the gear's in bag 2 and as you pull it apart, we want you to put the fill stems back into the bag, please.
IRWIN Yep, we understand.
SCOTT Okay, I'm going to need you to help me get this treadle up to the front, Jim.
IRWIN Okay.
IRWIN Bring the whole bag back here, so I can work it.
SCOTT Oh, Okay.
IRWIN Just, bring the bag back here and I'll just work it like I usually do.
SCOTT You can be doing something useful, instead of just standing.
CAPCOM Jim, we need pictures of your beautiful trench, there, in the collapsed wall. And we'd like, I guess, a photo pan around this remarkable core hole.
SCOTT Come on, bring it on over here, Jim. Jim bring it on over here
IRWIN Yeah. Joe, just stand by until we get this settled down and then we'll come at you for what is our next task.
CAPCOM Okay.
SCOTT You're going to hold off on jumping ahead of us, because we always have to come back and ask you what you said anyway.
CAPCOM Read you loud and clear.
SCOTT Okay, Jim, you're going to have to help me take the treadle off.
IRWIN Okay.
SCOTT Now, if you'll get on the other side, we can jiggle it and move it up towards the drill.
IRWIN Okay. Dave.
SCOTT (garble)
SCOTT You can't. You gotta put, - you can't put any up or down on it. It's gotta be side ways.
IRWIN Let me try.
IRWIN That's locked on there.
SCOTT No, it shouldn't be.
SCOTT Boy.
SCOTT If you could hold it up there, Jim. Hold it on the handle carrier.
IRWIN Let me get -
SCOTT Let me hold it and you just twist the drill off.
IRWIN Okay.
SCOTT Okay, just rotate the drill left. That a boy, just rotate it left. Easy does it. Keep it straight if you can. There you go. One more, just a little, keep

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SCOTT it straight. (garble). (garble).
IRWIN Hold it up. (garble)
SCOTT Take it off.
SCOTT Easy does it (garble).
IRWIN Okay, too much came off. Okay, just
stand hold.
IRWIN (garble) You want me to stand by here, Dave.
SCOTT Yeah, just hold on it for me.
SCOTT Listen, I can get it from there, Jim.
Go ahead.
IRWIN Okay, I'm going to take these pictures
that Joe requested, and if you need any help just
holler, and I'll be right back.
SCOTT Okay.
IRWIN Cause I'm right here, this much.
IRWIN Here's my trench, now. See.
IRWIN Okay, Joe, on the drill top goes. ALPHA.
CAPCOM Okay, ALPHA.
SPEAKER On the -

END OF TAPE

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SCOTT Okay, Joe, on the drill top end goes ALPHA.
CAPCOM Copy, ALPHA.
SCOTT But the bit goes BETA.
CAPCOM Roger.
IRWIN Okay, I have the photos of the trench. Did
you say you wanted a pan from this location, Joe?
CAPCOM Roger.
IRWIN Okay.
SCOTT Golly, there's some stuff in there.
IRWIN Please come on out.
SCOTT Coming - Okay, Joe on the top section goes
CHARLIE.
CAPCOM Roger.
IRWIN And I think we'd better bag but they're going
to have to go in here. I grabbed your camera, Dave.
SCOTT Yeh, thanks Jim.
IRWIN That's the one that jammed yesterday, isn't
it.
SCOTT Yeh.
IRWIN Oh, it worked - is that right?
SCOTT It was working there for a while and then
it jammed again.
IRWIN Okay.
SCOTT Hey, Joe, what bag do you want these core
stems to go into.
CAPCOM Bag number 2 Dave.
SCOTT Bag number 2 don't have any pockets.
CAPCOM No problem.
SCOTT Okay. It will be a problem when we start
working in the bag but -
CAPCOM Negative, Dave. That's an extra bag now and
we'll keep that in mind.
SCOTT Okay. Now let's see, we'll get the treadle
off. (garble)
SCOTT DELTAs the cap on top of the next section.
SCOTT Jim, did you get the vice on right?
IRWIN Sure did. (garble) Can only go on one way
Dave.
SCOTT Really.
IRWIN Damn. It's not working. There it goes.
Oh.
SCOTT Okay, the pan's complete here, Joe.
CAPCOM Super.
SCOTT I think I'll take advantage of the time and
put a black and white on my camera.
CAPCOM Sounds good.
SCOTT There's a new mag on here today, Jim. It
couldn't have been the one that failed yesterday.
IRWIN I had the color mags on there GT. That's
the ones that were on there yesterday.

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SCOTT No it wasn't either. PT is brand new.
CAPCOM That's right, Dave, tango tango's a brand
new mag.
SCOTT Okay, I'll try a whole malfunction procedure
on it then.
CAPCOM Okay, atta boy.
SCOTT I hate to tell you, Jim, but that - Oh boy
this vice is on - I swear it's on backwards. The holes on
the hand tool carrier only line up one way. Doesn't work
(garble). How many hours you want to spend on this (garble)
Joe, like the vice doesn't bite strong enough. I get it
gripped so I can break the sections.
IRWIN Dave, if you want, I can get on the other
end and hold it steady.
SCOTT Well, you can try, Jim, if it does any good.
but the vice - the training ones hold good there's never
any problem with them.
IRWIN Okay, let me get on the other end.
SCOTT Some taps behind your left boot.
IRWIN Oh, shit, I knocked them off again. Here
I'll take them.
SCOTT No go get the mike and the drill, I think
we're about through with this. Okay, I've got it.
IRWIN Okay.
SCOTT Won't bite. Don't hold it that way. Hold
it straight on the vice if you can, Jim. See how it sits.
IRWIN Yeh.
SCOTT See it doesn't grab. That's got it there.
Okay. Hold it like that now. Man oh man. Hold it right
there.
CAPCOM Dave. The treadle may be jammed against
the pin - there it moves away.
SCOTT There. Trouble is - okay, let go a minute.
Okay, now (garble) a little ways. Hold it again, Jimmy,
here.
IRWIN Yeh, I got it.
SCOTT Okay, oh boy. Joe, I haven't heard you say
yet you really want this that bad. Don't mean to tell me
you really want it this bad.
CAPCOM It's hard for me to say Dave. Beautiful.
IRWIN I'll get those caps for you, Dave.
SCOTT Okay, can you get those out.
IRWIN Yeh.
SCOTT Okay, thank you. Okay cap number echo is the
next section. Okay. Now old buddy if you think you can
have some luck taking that off, I'll tell you what they're
breaking again.
CAPCOM Dave, how many more sections are coming apart?

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SCOTT Oh, standby Joe. We've got 1, 2 3 4.
CAPCOM Thank you.
SCOTT (garble)
IRWIN That doesn't look right either. Let's try
the other way. Man, how did that treadle get like that.

END OF TAPE

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SCOTT That doesn't look right either. It's going the other way. Man, how did that treddle get like that.

IRWIN It's moving.

SCOTT I think it's broken.

IRWIN I think it's jammed.

SCOTT Let me see if I can get it out. Work it out towards you. Because of the cap. See what I mean. Take that put it in your right hand - -

IRWIN Work on the rest of them here.

SCOTT Okay. Voxtron on the next section.

CAPCOM Roger.

IRWIN If I had known this I would have left my cover gloves on, Dave.

SCOTT Well, don't mess with it then. Don't mess your gloves up.

IRWIN I'll do it. They're okay.

SCOTT I'll take it. This splice just won't hold. There's something wrong with it.

SCOTT It doesn't work at all. I'm going to have to have you hold it. Bet they're an hour and 15 minutes into it already. We're still fiddling with this thing. Okay. The treddle is off.

IRWIN Beautiful.

SCOTT Stick this in here. Now hold that section for me. Okay. Did before. It's just not gripping.

CAPCOM Dave and Jim, Houston.

SCOTT Go ahead.

CAPCOM Roger, troops. What's your best guess. Do you think you can turn off the bottommost drill section.

SCOTT You can see on the TV, that's what we got. Now the vise - the wrench, the hand wrench works okay. The one on the back of the hand tool carrier doesn't want to work for some reason. It may just be because of the threads on the stems. I just can't get them broken apart. And that's the main problem. The wrenches don't work.

CAPCOM Dave and Jim, put that section on the ground if you would please. We'll pick it up on the way back. And we want you to continue on with the grand prix.

SCOTT Good enough. Do that.

IRWIN Put it in there Dave, we might be able to return it just like that.

SCOTT Yes, I think probably so. I don't know where we're going to put it in the command module. I'll think of something. Let me see. Let me put it someplace where we don't ding it. There's no place to put it. I'll lay it right here on the treddle. I guess we ought to take it back. We've tried the best (garbled) thing we've done.

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SCOTT Okay. Get your camera.
IRWIN Okay. (garbled) Let's see. We don't want the drill on here. What do you want to do with the drill.
SCOTT Oh, just leave it right here.
IRWIN Put it on the surface there.
SCOTT Yes.
IRWIN Got a good bag.
SCOTT Why don't you check it out and see if it runs.
IRWIN I did. I checked it out one foot per second earlier.
IRWIN I'll give a short burst here.
CAPCOM Good thinking, Jim.
CAPCOM Dave, while you're climbing on the Rover, we'll take - -
SCOTT High gain antenna is getting - -
CAPCOM the meter readouts and your heading is 2 - -
SCOTT The systems reset but it may well have been zero. I stopped here.
CAPCOM Good enough for me.
SCOTT PMLWB.
SCOTT Okay. Let's get our - -
IRWIN Okay. I have the camera set.
SCOTT Okay.
SCOTT Here the sun should be over your right shoulder.
IRWIN Why don't you take a right turn there. You should be 45 degrees looking up towards (garbled) hill over there.
SCOTT You want to do a quick turn there so you don't get dust on my experiment.
IRWIN Oh, sure. Watch out.
SCOTT Going backwards Jim.
IRWIN No sweat.
SCOTT Yes.
IRWIN If you want you can do a left turn there Dave. And I'll move back a little more.
SCOTT Okay. Let me get my seatbelt on.
CAPCOM Dave, before you move out, you want to double check your heading at 292.
SCOTT Okay, Joe.
SCOTT A long way to go. I think this torquing swiching is that tall switch that is spring loaded.
IRWIN It would help.
SCOTT Be with you in a minute, Jim. I'm going to torque another 90 degrees or so.
IRWIN No rush.

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CAPCOM Enjoy the scenery, Jimmy.
IRWIN Yes. I'm looking to find out where
all the big rocks are.
CAPCOM Sounds good. And tell Dave once again
that you don't want any dust on your experiments.
SCOTT Hey, Joe, you never did tell me that
drill was that important. Just tell me that it's that
important and then I'll feel a lot better.
CAPCOM It's that important, Dave.
SCOTT Okay. Good. Cause then I don't
feel like I wasted so much time.
CAPCOM No. Quite seriously, Dave and Jim,
that's undoubtedly the deepest sample out of the moon for
perhaps as long as the moon itself has been there.
SCOTT Boy, that sounds good.
SCOTT Okay, Joe. I'm torqued to 292. And
Jim I'll take a left turn out of here. Making sure I don't
get any dust on your experiments. Okay. You're in a good
spot.
IRWIN Okay. I'm ready for you.
SCOTT Okay. Wait for me to get over here
and get set up.
IRWIN Okay. Let me move back a little bit - -

END OF TAPE

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SCOTT Okay. You're in a good spot.
IRWIN I'm ready for you.
SCOTT Okay. Let me get over here and get set up.
IRWIN Okay let me move back a little bit then.
SCOTT Now you're okay right there.
IRWIN (garble) over your right shoulder. That's
just about right. Okay. Take a little left turn there.
I'll start up and go constant if you're ready?
IRWIN I'm ready.
SCOTT Okay. Okay here's about 7 clicks.
IRWIN Camera is on.
SCOTT 7 kilometers an hour. Tell me when to turn.
IRWIN Okay you can turn now.
SCOTT Okay. Better. Okay here comes acceleration.
Couple of Di-Do's here. Up to 12 clicks.
IRWIN Ride 'em Bronco.
SCOTT Yeah man. Okay. I'm going to make a right
turn.
IRWIN Kicked up a very nice rooster tail.
SCOTT Good. Make a right turn here. And I'll
come back across and give a hard stop. If I can find us a
smooth spot to get going here.
CAPCOM Jim this is Houston here. How does that
camera seem to be working?
SCOTT Okay. Here we go.
IRWIN It feels like it's working, Joe.
SCOTT There's the hard stuff.
IRWIN Okay we'll check it. Ah shoot!
SCOTT Didn't work? You're kidding?
IRWIN Indicator is still at full. Oh, boy.
SCOTT Want to try another mag?
IRWIN Guess we should.
SCOTT Let's do it later. Because I have to get
off and get unstrapped and everything else. Let's get to the
seat pad.
IRWIN Okay.
SCOTT I still indicate full Joe.
CAPCOM Okay Dave and Jim that was a good try.
Let's press on towards station 9. Let's take a good clean
comfortable look at that Rille.
SCOTT Yes that's a good idea, Joe. Best idea
you've had all morning.
IRWIN I don't know what's wrong with this camera.
I checked all the film again and ran it through with my
finger a few times and made sure that the film was right
on the, the preparations were right on the red mark.
CAPCOM Roger, Dave. We hear you. Sounds like
you followed the owners manual.

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IRWIN Oh wait a minute. Just stay right there
let me get off.
SCOTT (garble) get your seatbelt.
CAPCOM Dave, while Jim is climbing on there, could
you get some Rover readouts, please.
SCOTT I'll give those to you, Joe. Starting with
heading.
CAPCOM Go.
SCOTT 2.
SCOTT Your going have to get off and do it later.
Hop off.
SCOTT Get it later.
IRWIN Okay give me that extension handle now.
SCOTT Okay now why don't you try hopping up here
again. Easy. And I'll hold the camera for you.
IRWIN I can hold it.
SCOTT Don't lean so far back when you get on Jim.
SCOTT What's happening here you get - let your
PLSS down a little bit.
SCOTT Okay you're on and strapped in.
IRWIN Okay Rover readoffs, Joe. 72 0 on berring
distance 12, range 0, amp hours 90 95 100 105 and motor
temps are still off scale low.
CAPCOM Thank you Jim. Copy.
SCOTT Okay ready.
IRWIN I'm ready too.
SCOTT Okay. Where we heading?
IRWIN We'll be heading head west, man. Heading
towards station 9. Head about 270 until they give us an
update.
CAPCOM That sounds good, Jim. 265 to 270 for
about 1.8 clicks and just enjoy it.
IRWIN Okay and we're moving.
SCOTT Yes we're going around the ALSEP too.
IRWIN Yes, let's not drive through the ALSEP
SCOTT Yes.
IRWIN That's too bad the camera didn't work
because there was some neat bumps there.
SCOTT Yes. Is that a glass ball right there?
IRWIN Yes.
SCOTT Right on top of the surface about 2 inches
or so. There's several here. Here's one over at one o'clock.
IRWIN Yes.
SCOTT Almost like a black (garble) of glass.
CAPCOM We copy that.
IRWIN Right now we're heading, swinging around
more to the west. We're heading 270. Range .1.
CAPCOM Roger, Jim. Copy. And shortly you'll be
passing the Quark triplet that's on your right probably and

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CAPCOM we'll be most likely be directing you back towards the western crater in that triplet for some mare sampling towards the end.

IRWIN I see them and they look -- look rather fresh. There's a lot of angular light colored blocks. Fragments on the rim, Joe. So, mark that position here where bearing 110 and range .2.

CAPCOM Okay, fine.

IRWIN We dropped into a shallow depression there and that was the Quark triplet there on the -- the northwest side of that shallow depression.

SCOTT Look at this nice little new fresh one.

IRWIN Yeah.

IRWIN But there are not too many fragments on the -- the rim.

SCOTT You're right.

SCOTT Oh, there's (garble).

IRWIN There's a very large depression ahead of us.

SCOTT Yeah.

IRWIN We don't want to drive through that.

SCOTT I don't know whether we do or not. Let's take a look at it.

IRWIN I don't think so, Dave.

SCOTT Let's take a look at it.

SCOTT Look at the big boulder there, Jim.

IRWIN Yeah, I saw that one.

SCOTT About three feet angular.

IRWIN A very large depression here. I say let's go north of it.

SCOTT I think you're right.

CAPCOM Roger, we agree.

SCOTT I can't -- I really can't tell -- really can't tell how wide it is, but it's very shallow at the deepest portion of it, it looks like there's a crater.

SCOTT (garble). It looks collapsed north to south, doesn't it?

IRWIN Sure looks elongate.

IRWIN I don't - I've got our map here.

SCOTT (garble). Sure can't pick that up.

IRWIN Nope, sure can't.

IRWIN Let's see. We're going about 8 clicks.

IRWIN And we're kind of dropping down as we go around the -- and we're heading 320 on the northeast rim of this very shallow depression.

IRWIN By shallow -- the slopes are probably three degrees and I guess the -- at the deepest part there, probably oh, 200 feet deep. Right now, we're on the -- the north side of that depression.

IRWIN (garble)

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SCOTT Yeah.
IRWIN Now, we're swinging around to the west heading
270.
IRWIN Heading right towards Bennet Hill.
IRWIN Dave, I'm going to call that big crater Wolverine.
SCOTT Oh, that's a good name.

END OF TAPE

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IRWIN Dave, I'm going to call that big crater Wolverine.

SCOTT That's a good name.

IRWIN It's (garbled) big crater.

SCOTT Okay. Bearing is 113 and we're .6. There's another big one, Jim. And look at that rock over there.

IRWIN Oh, yes. Look at that one. Sitting right on the surface.

SCOTT A block angular frag on the northwest side about 1/4 of the way down. But a very subdued crater. That block is - isn't that something.

IRWIN We're going to drive by it anyway.

CAPCOM And Jim don't hesitate to fire off pictures right and left here. We've got lots of film.

IRWIN Oh. I wish I could, Joe.

SCOTT Right there.

SCOTT Okay. We've stopped. Just for a second though.

CAPCOM Okay.

SCOTT You getting them.

SCOTT Got it.

IRWIN Okay. We're moving.

CAPCOM Roger.

SCOTT Hey, that's something isn't it?

SCOTT I bet it chipped that hole, Jim. It went right in - it came from that - it made that crater there. And it came from 250 - I mean 070. That angular projectile about a foot across, Joe, and made a secondary about a meter across and it came from a 070 heading. I bet you anything because the - oh, that was neat. One part of the frag was covered with glass and the central part of the crater was covered with glass. Obviously a secondary and obviously made by that angular frag.

IRWIN Dave, we've got another shallow depression here on the head. I don't know whether - I'd say we'd be better off staying to the north, wouldn't you?

SCOTT I don't know. We're making good time.

IRWIN Okay. Well, let's go through it then.

SCOTT There's a big one -

IRWIN A fresh one out at 1 o'clock.

SCOTT Yes.

IRWIN It looks like a large fresh one. There are a lot of angular light colored blocks on its rim.

IRWIN (garbled) going through here are we

SCOTT To go around it. We're making good time.

IRWIN Okay.

SCOTT Down here to the left it looks pretty flat.

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IRWIN Okay. We're heading through another shallow depression.

SCOTT Similar to the last large depression that we described. What's that fragment, at 12 o'clock to us. Another piece of glass I suppose.

IRWIN That shiny one there.

SCOTT Yes. Another glassy fragment angular about 3 inches long sitting right on the surface. And you know it's really - the surface is smooth, but it's pretty rough out here. Smooth on a small scale and there's lots of -

IRWIN You really could get lost here

SCOTT Yes. Up and down.

IRWIN Up and down. Yes.

IRWIN It was great going uphill. Going up to the front you could always look back and see the LM. It's like driving over the big sand dunes in the desert.

CAPCOM Roger, Jim. Pretty description. And you're looking for nav readings of 1.8 clicks at 088 when you're at station 9.

SCOTT Okay. We're 10 now on range. Bearing 101. And now there's another very large shallow depression.

IRWIN And Dave they're all about the same size.

SCOTT Yes, you're right. Go around south of this one.

IRWIN I think you know the first really shallow depressions are very subdued craters we've seen. And there are just three in a line that run east/west.

SCOTT Yes. Let's see. They're probably about 100 meters across and maybe 10 - 15 meters deep.

IRWIN Yes. Man!

SCOTT I thought we'd whip right over to the rille. I didn't think we'd have this type of terrain.

IRWIN It was a lot easier driving yesterday.

SCOTT Yes. Surprises, surprises.

IRWIN Look at that rock over at 1 o'clock. It's right - it's on the horizon. It's like kind of a pedestal.

SCOTT Yes.

IRWIN You can see a lot of them right on the horizon.

SCOTT Okay. We probably want to - -

IRWIN When you can Dave swing around to the west. We're going a little too far south here.

SCOTT No. We're doing fine.

IRWIN Say again the coordinates, Joe, of the station.

CAPCOM Dave, you're driving towards 1.8 clicks, 088 bearing.

SCOTT Rog, we're doing good. We're 092 now heading slightly south.

IRWIN Yea, but what I'm thinking, there's nothing unique about station 9, is there except maybe Scarp creater.

CAPCOM And you thinking correctly Jim. Any where along there is beautiful.

IRWIN Roger. I was thinking you know, just a good sample point.

SCOTT Yea.

IRWIN On the rim. We (garble) the distance.

CAPCOM Right on Jim. Just don't drive to far west.

IRWIN I say, I thought I could see it. Okay. Yea, Joe, we'll let you know when the slope gets up to 26.

SCOTT I think I can see the far side of the Rille now.

IRWIN I think we're coming up on the rim of it.

SCOTT Yea. Take a little jog over here to where it's a little smoother. Steep slope isn't it. Yea, I think we can, no, it's a little fresh creater.

IRWIN Yea, fresh creater.

IRWIN And you do kind of get the impression there's a Rille, rim here.

SCOTT Yea.

IRWIN Or levee. Off to the left there, the higher part.

SCOTT Yea. Sure do. I see how it is.

IRWIN There's a rough terrain ahead of it.

SCOTT Yea.

IRWIN We drop down into another, another little valley. There's another one of those shallow depressions off on at 1 o'clock. Right now our bearing is 8, 89 range 1.4.

CAPCOM Roger.

IRWIN It must be, holly cow. This must be, I'll go around to the left here. Yea,

SCOTT Or to the right there, it's fairly smooth to the right.

IRWIN Yea, it's closer here. Okay, we're heading down into another depression. It has oh 1, 2, 3, 3 other recent creators. The one on the southern rim looks to be the most recent, in fact it's kind of a doublet with a smaller creater on the north rim of it.

SCOTT We'll look at the two here, yea.

IRWIN Could be a doublet there on the left.

SCOTT Yea. Another one.

IRWIN Okay, we heading 087, right now we're heading 2, oh about 250. Range 1.5. Look at the fresh blocks ahead of us.

SCOTT Yea.
CAPCOM Rog, we copy. You must be very near
Scarp creater.
IRWIN Oh yea. I was going to say that's
probable Scarp crater.
SCOTT The fresh one.
IRWIN Yea.
SCOTT It's a beauty.
IRWIN It sure kicked up a lot of rocks. What
are you going to do, go on the north side of it.
SCOTT I'm going to take a look and see if
that's it. Yea. Boy it's really fresh with a lot of debris.
Nice injection blanket. Nice injector blanket. Good typical
one. That's Scarp. And we're 088 for 1.6. I'd say this is
probably Scarp creater wouldn't you.
IRWIN I would because we can definitely see
the far side of the Rille now.
SCOTT Yeah.
IRWIN We could drive back to this one.
SCOTT Sample it right. Yea, let's press on.
IRWIN Take a look.
SCOTT Yea.
CAPCOM Roger, we agree. And with any luck
at all that is Scarp crater.
SCOTT Yea, let's do this one anyway Jim.
IRWIN Just drive it back.
SCOTT Okay, I, wait a minute let me get to
where I can -
IRWIN And we can definitely see the west side
of the Rille from here.
SCOTT Yea.
IRWIN You can probably see, oh 10 to 15 percent
of the far side.
CAPCOM Copy.
SCOTT Oh, let me get it for you.
IRWIN And the reading 267 088 2.2 1.6 90 92
100 108 and motor temps are still low.
CAPCOM Roger.
SCOTT Valve okay, good.
IRWIN I'm going to see if I can fix my camera.
CAPCOM Good idea Jim -

END OF TAPE

CAPCOM Roger.

SCOTT Double take, good.

IRWIN I want to see if I can fix my camera.

CAPCOM Good idea, Jim and Dave if our TV camera is still tilted down, could you fix it for us please.

SCOTT Rog.

IRWIN There you go, it's up. I'll try and get you on the AGC, you ought to be there.

SCOTT AGC looks good.

CAPCOM Okay, thank you DAVE, and a word on that camera. We'll position it before the two of you start to move and just leave it in whatever position we put it in.

IRWIN Okay, we're not parked very good for you to see, Joe, but I guess that's the breaks.

CAPCOM Dave, could you give us an EMU status check please.

SCOTT Yes sir. I've got clear flags about 74 percent and 3.85.

CAPCOM Sounds good.

IRWIN I've got 3.85 flags are clear and 75 percent.

CAPCOM And Jim, do you want some help on that 70 mm camera mal procedures?

IRWIN Well, I'm holding the trigger depressed and advancing the film, manually, to see if it -

CAPCOM That's right on.

IRWIN ... it'll kick over. But it's not. I guess it's not working. I guess the only thing I could do at this point is change the mag.

CAPCOM Jim, before you do that could - try rotating the lens in front, it may be hung up between detents

IRWIN Yeah, I'll try that. You mean the locking device on the lens itself?

CAPCOM That's right.

IRWIN No, it's locked. Dave, you want to take the time here to let me change the mags?

SCOTT Yeh, why don't you try it Jim.

IRWIN Okay, I'll try it -

CAPCOM Sounds good to us, Jim.

IRWIN I'll get to work here -

SCOTT Okay.

SCOTT I'll get a pan from the rim of Scarp and the rim is very very soft. My boot sinks in a good, if I push on it, a good 4 inches. And the whole center part of the crater is just full of debris. Very angular, glass in the center. It's about - oh I guess 40 meters across and maybe 5 or 6 meters, naw, not that much - 3 or 4 meters deep. And a slightly raised rim - an ejecta blanket that goes out about

SCOTT one crater diameter, quite uniform, I don't see any rays that are (garble) from some of the fragments and we'll get the sample in a second here.

CAPCOM Roger. Jim you might try cycling that camera without a mag in it, if we've caught you in time here.

IRWIN Yeah, you have, just right. Okay I'm trying it. Yeah, I think the camera is working, Joe. Put Mag Romeo on it.

CAPCOM Sounds good.

SCOTT That mag for a while this morning didn't it Jim?

IRWIN Camera's got so much dust on it -

SCOTT There is a little bench in the bottom of Scarp Crater halfway up about a tenth the diameter of the crater. That's only - And it seems to be all the way around, somewhat irregularly.

CAPCOM Rog, Dave, please continue.

SCOTT Okay, I'm going to get a couple of samples from the rim here, on the surface. The first one I tried to pick up just fell apart.

IRWIN Here's a couple pieces of it.

SCOTT Won't be able to look at it for you, but I'll bring it home. It's a clod, just a caked clod, and it's 273.

IRWIN I'll come over there Dave, I put on the other mag - it doesn't work. I think the shutter is working on the camera but the drive is not.

SCOTT That camera was working fine last night.

IRWIN Okay I'll come over.

SCOTT Okay. This stuff is really soft.

IRWIN 73.

CAPCOM Roger.

IRWIN Well, if you want Dave, I can take your camera and do the documentation pictures.

SCOTT Oh, I can do them just as well. Look at that there's slipping slides on that one.

IRWIN Got something on the rim.

SCOTT Boy this - well, you've probably commented - sure is a neat crater, neat - than we've seen so far.

IRWIN Hey, you're right, very soft on the rim.

SCOTT - isn't it though. Sink in about 6 inches - look like bit pieces of mud don't they. Okay, let's take a couple of steps at the rim here. I've got one on the rim.

IRWIN You did get the sample all ready.

IRWIN Yeah. Move down here a ways out on the ejecta and see if we can get a couple more. Here's a nice big one. It's too big for the bag.

SCOTT So much sparkleys Jim, think we can get that in the bag?

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IRWIN I'll try.

SCOTT This has the appearance of those small ones we sampled with the exception there is no concentration of glass in the very center, except every fragment has glass on it.

IRWIN That's right. Well, not every fragment, many of these clods don't have any at all, most of them don't have any glass. Look at that one there. Give me a - oh, you got a bag, okay. Just a second here. Okay.

CAPCOM Dave and Jim, this is Houston. When you finish this we suggest you move over closer towards the rim of the rille.

IRWIN Rog, Joe, bag number 255 is covered with dirt but it looks just like a big piece of glass. GARBLE fines in with the GARBLE.

CAPCOM Roger, Jim throw in a little soil there please.

IRWIN Let me have the bag.

END OF TAPE

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IRWIN (garbled) in with the station.
CAPCOM Roger Jim. Throw in a little soil there,
please.
IRWIN Don't mess up the rock, but pick up that little
glass ball next to you too. The little glass ball next to where
you scooped up.
SCOTTq To the left of it you mean?
IRWIN Yes
IRWIN That's an idea.
SCOTT Yeah.
SCOTT That's it, That's it; don't worry about it;
think you dropped it Jim.
SCOTT Yeah. Good?
IRWIN Okay.
SCOTT Okay.
IRWIN Right Away.
CAPCOM Dave and Jim. This is Houston with the News
Report for you.
IRWIN Go.
CAPCOM Roger. Be advised your Command Module Pilot,
Alfredo just hit a perfect plane change burn.
IRWIN Oh, that's good news. But we knew he would.
CAPCOM Rog. He's coming back to look for you.
SCOTT Good for him.
SCOTT Hey, Jim; I'll tell You. You've got to drive
slowly. In fact, let me walk. I can walk as fast as you
drive.
IRWIN No, you can't. No way.
SCOTT I'll hop on but I don't need the belt.
Where's your camera?
IRWIN Under - yeah put it under, and take 1 crack
at it. Where did you put it?
SCOTT On my - next toyou.
IRWIN Oh, yeah. Let me take 1 crack at it here
before we go.
SCOTT Okay, the master craftsman.
IRWIN Made it. Take it out.
SCOTT Okay. I thought it would be easier to work if
IRWIN Look's like it's trying to drive.
SCOTT Yes, the shutters driving, but it's just
not driving the film.
IRWIN What a pity. It's a bubble. Right you want to
carry it or chuck it?
SCOTT I think I'll just put it in the seat.
IRWIN Yeah.
IRWIN Joe, we'll try and see if we can run your
TV while we're running.
IRWIN Okay, hang on good.
SCOTT Yeah.
IRWIN Ready?
SCOTT Ready.

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IRWIN Okay, we're moving west.
SCOTT Maybe you can - I'll just keep this heading and with any luck at all you might be able to point out the front and take a ride with us. Going slow. I see the camera moving.
IRWIN Over on the far side of the rille, Dave - I sure see layering over at 1 o'clock.
SCOTT Let's get up here first.
IRWIN Yeah.
SCOTT Sure do.
IRWIN See if we can find one of the twins here.
IRWIN Get the feeling we're coming up a real ridge line, don't you?
SCOTT I can see one of the twins about 1:30. There's a fresh one. Oh, look at the good blocks on there.
IRWIN Yeah -
CAPCOM Dave, this is Houston.
SCOTT Good places all along here to sample - large blocks on this side of the rille.
IRWIN Yeah, you're right.
SCOTT Look down there at 12:30. It looks like a block there almost in position. Sure do and it's a big out-crop.
IRWIN Yeah.
SCOTT And we are on the terrace, and there is a terrace.
IRWIN Yeah.
SCOTT Pretty good slope. We could probably drive down there though.
IRWIN I think we can drive over - straight ahead and stay on a fairly level contour. We don't want to
SCOTT You just want to drive up there to where
IRWIN (garble) twins.
SCOTT Think that's Rim Crater there.
CAPCOM Could very well be -
SCOTT Drop down to them?
IRWIN Yeah.
SCOTT This should be right where we park. Those should be good pictures in Houston. Isn't it though. I think they'll enjoy that. (garble)
CAPCOM Dave, when you climb off could you dust off our TV lens please.
SCOTT Certainly. We're off and stopped and going to get on with the task here.
CAPCOM Okay, and Jim, you may want to use Dave's camera to record this on film while Dave uses the 500 millimeter camera.
IRWIN That's exactly what we're doing. You must have dropped COMM there, Joe. That's what we're in the process of doing here. After I dust your eye off.

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IRWIN Not bad, Joe.
SCOTT Yeah, that a boy, swing it around there and
you're going to see a spectacular place. Boy oh boy.
CAPCOM Dave, if you're still there. We'd take
the Rover readouts, but they're not crucial.
IRWIN I'll get them, Dave.
SCOTT I've got them right here. 9092 uh, the voltage
is 6868, battery temperatures 101 and about 110 and motor
temps are off scale low, the bearing is 088, the range is 1.8,
distance 2.5.
CAPCOM Right on, thank you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/2/71, 5:57CDT, 165:22GET, 483/1

SCOTT the 68 and 68 battery temperature's 101 and about 110, and motor temps are off-scale low, the bearing is 088, the range is 1.8, distance 2.5.

CAPCOM Right on, thank you.

SCOTT And I have the 500 out.

CAPCOM And look at that rille.

SCOTT How about that?

CAPCOM How about that hill.

SCOTT From the top of the rille down.

There's debris all the way and it looks like some outcrops directly at about 11:00 to the sun line, it looks like a layer about 5 percent of the rille wall with a vertical face on it and within the vertical face I can see other small lineations, horizontal about maybe 10 percent of that - that unit. And that unit outcrops along the rille; it's about 10 percent from the top and it's somewhat irregular, but it looks to be a continuous layer. It may be portions of flows, but they're generally at about the 10 percent level. I can see another one at about 12 o'clock to the sun line, which is somewhat thinner, maybe 5 percent of the total depth of the rille, however, it has a more well defined interior - internal layering of about 10 percent of its thickness. I can see maybe 10 very well defined layers within that unit.

CAPCOM Beautiful, Dave, beautiful.

SCOTT As I go down the rille, below this - below this upper layer at 10 percent, there seems to be mostly debris in the order of large angular fragments, maybe the largest being like 5 percent of the total depth of the rille, and then they gradually break on down to - uh - very small fragments and a table slope. I see no significant collection of talus at any level. It seems to be fairly uniformly distributed in patches all the way down to as far as I can see to the bottom of the rille. In looking on to my 12:30 to 1:00 on up the rille, and I guess we'll get a little closer when we get down to sampling it down there; why it looks very much the same; outcrops of this one unit irregularly spaced discontinuous, but along the general 10 percent from the top line, with the talus sliding down into the bottom of the rille. I see no differences in the color, however, the vertical section of the unit, which is exposed looks to be somewhat lighter in gray; the blocks which have fallen down into the talus seem to be - have a more tanner, or different tone of gray or color tones, sort of like the fresh vertical section was more recently exposed. Let me let you digest that for a minute and let me take a bunch of 500's so I can get you the vertical and the horizontal and oh there's lots of things to shoot at over there. Jim, where'd you take the pan? Right over here?

IRWIN No, there's a little circle on the ground.

SCOTT Okay.

SCOTT Okay. Lens cap is off.

CAPCOM Thank you.

SCOTT Okay. First, I'll get you a horizontal strip along the two outcrops.

IRWIN Okay, Joe, I just sampled a fragment here with a great number of vesicles - vesicles about 2 millimeters in diameter. It's in 274.

CAPCOM Roger, Jim.

SCOTT And, I'll get you a horizontal strip of the - I guess I'll have to say there is more of an accumulation of talus at about the 60 percent from the top level that I can see, Joe. If I think about it for a minute, I can see more talus accumulation there so - that there might be some change in slope, but it's not apparent by looking at the slopes, and I'll get you a horizontal strip there.

CAPCOM Isn't that something?

IRWIN And down about, oh 20 feet from where Dave's taking a picture, there's a block about 2 feet; it's almost rectangular and the top surface is covered with large vesicles and almost looks like a contact there between a thin - that thin layer of vesicles and a more rough - it's a little later in color with pure vesicles. In fact there's really orin - horizontal orientation of the vesicles in this one. I'll take a closeup on it.

CAPCOM Beautiful, Jim. Thank you.

SCOTT Oh, and there's a - looks like a crater in the far wall at about 9:00 to the sunline. It's a round circular depression almost - doesn't look like the kind of crater that would occur in a slope like that; there's no build up at the bottom. It's a - the rim seems to be fairly parallel to the slope of the rille. Get that one.

CAPCOM Okay, Dave.

SCOTT Horizontal strip across it; horizontal strip above it which should take in the upper 10 percent; vertical strip through it.

IRWIN Let me know if I get in your way, Dave.

SCOTT Okay.

IRWIN Looking to the south along the rim, along the - this side of the rille, Dave can you comment on that horizontal bedding that's probably - oh at least a kilometer south of it at higher - higher elevation.

SCOTT On the other side?

IRWIN No this side.

SCOTT No, I didn't even look on this side, to tell you the truth, Jim.

SCOTT Oh there's a - I can see a couple of outcrops on the far side which look like they might be in place at about the 40 percent level of the rille; very large boulders with fractures in them rounded. It's hard to tell whether they're really in place, but they may be in place covered by talus. And they're about 50 percent down. Let's see if there's any continuity to it. I can see some suggestions of continuity there, Jim. Look at that - well it looks like that the talus

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SCOTT of fragments and fines is covering another layer or it's a suggestion of continuity of outcrops which are rounded at about the 40 to 50 percent level down.

IRWIN Yeah, I see what you mean.

SCOTT Yeah. See that? All the way across.

IRWIN Yeah. It's worth shooting a picture.

SCOTT You know, I'm really surprised that the bedding is as obvious.

CAPCOM The frame number Dave.

IRWIN Sure is. Yeah.

SCOTT Okay, let's summarize your -
Oh, frame number, yeah. 76.

CAPCOM Okay.

SCOTT I guess that will do it for here. To summarize here, I think we see from the top to the bottom; one distinctly about 10 percent, which has the multilayers within it and another at about 40 percent which looks like a solid unit of a somewhat tanner hard rock, but it's covered with fines and talus, and we haven't seen to the bottom, but we think we'll get a chance to look - -

END OF TAPE

SCOTT And about 40 percent which looks like a solid unit of a somewhat tanner hard rock but it's covered with fine, some talus. And we haven't seen to the bottom. I think we'd get a chance to look further down.

SCOTT Hang on.

IRWIN Yeah.

SCOTT All right.

IRWIN Yeah.

SCOTT Very soft there.

IRWIN Stumbled over that rock.

SCOTT Yeah.

IRWIN Ease that up for me?

SCOTT Yeah.

IRWIN Just a minute. Let me get that one over there.

SCOTT I did it.

SCOTT Durable little fellow.

IRWIN Yeah.

CAPCOM Okay, Dave. You might check the lens and if it looks reasonably clean see if you could get the bit of outcrop on the near side to the south.

SCOTT Okay.

IRWIN The lens is reasonably clean and I'll brush off anyway.

CAPCOM Rog, that or blow on it.

SCOTT Oh, that's better. There.

CAPCOM Okay.

IRWIN I'm documenting another rock. The other looks fairly representative of what's on the surface, here.

SCOTT Okay, I got the stop at 8, see what I can do down --

IRWIN Did you know what we're talking about down there, Dave.

SCOTT No. What do you see?

IRWIN I see horizontal (garble)

SCOTT Oh, yeah. I heard what you said. Somewhat -- it looks like it might be dipping very slightly to the east.

IRWIN Yeah.

IRWIN Right. See -- the exposed upper surface of that layer?

SCOTT Yeah. You're right.

SCOTT Yeah, I see. Got it.

IRWIN Gee, I'll shoot some more while I get some more rocks, there.

SCOTT Let me come help you.

SCOTT While you -- Pick a few.

SCOTT Yeah. Okay, that's enough 500 and --

IRWIN I think we ought to -- maybe either move downslope toward the large block.

SCOTT Yeah. Let's go down there and sample.

IRWIN Okay.

CAPCOM Same count, Dave?
IRWIN This time I'll look and make sure I don't
fall over some silly rock.
SCOTT 86, Joe.
CAPCOM Okay.
SCOTT Okay, Jim. Let's go --
IRWIN Why don't you head down. I'll be right
behind you. I got one more here I want to gather.
SCOTT Okay.
SCOTT You'd better hand the camara so I can't do
anything. I know what --
IRWIN (garble) working on documented.
SCOTT Let's -- Let's -- ease down to
this outcrop here in front of us. It's a good solid firm
ground here, Joe. Good footing.
SCOTT You could probably see.
SCOTT And I'll see how it is going back up?
IRWIN Yeah.
SCOTT No problem coming back up.
IRWIN Oh, did you -- Oh, yeah, you looked at the
one that has the (garble) close up to that --
SCOTT Boy, that's a beauty.
IRWIN You should see the vesicles in that the
alinement, the orientation of the vesicle.
SCOTT Called organization, huh?
IRWIN Yep.
SCOTT Oh, we can almost see --
SCOTT Looks like a little pits in the dirt.
CAPCOM Dave, is that a reasonable area for a rake
sample, do you think?
SCOTT Yes, definitely, Joe.
SCOTT It sure is.
CAPCOM Okay, maybe that's the quick way to get a
bunch up.
SCOTT I didn't bring the rake. We'll take the
rake samples here on the rover.
IRWIN Yeah, right, Dave.
CAPCOM Okay, sounds good.
SCOTT Aha. Here's some -- Oh, well, we got to
get some of that.
SCOTT Gosh, big angular blocks?
IRWIN Vesicles.
SCOTT It looks like basalt. I think I see (garble)
yet. To break a chip off one of those.
SCOTT Coming?
IRWIN Yeah, right behind you.
SCOTT Okay. Let's sample this up. See these frags
right on the surface, here?

IRWIN Yeah.
SCOTT Looks like it came from somewhere.
IRWIN Yeah. All -- all the same.
SCOTT Yeah.
SCOTT Yeah, let me --
IRWIN Pick one up and I'll take pictures.
SCOTT Okay.
SCOTT Right there. We'll do that one right there.
SCOTT Hope the -- Do you have --
IRWIN Get a fragment, you mean.
SCOTT Yeah.
SCOTT There's a big one.
SCOTT Just this side of the gnomon.
IRWIN You're right.
CAPCOM And Dave and Jim. This will be probably
our last documented sample that we will have time for. We're
going to ask you to move on back to the rover when you're
finished here for a rake sample.
SCOTT Okay.
CAPCOM And we're looking to about 10 to 15 more
minutes with this stop. No more.
SCOTT Careful. Careful. Don't do like me.
IRWIN That's a big rock there.
SCOTT It sure is.
IRWIN Good picture.
SCOTT Go ahead.
IRWIN Did you get the tube?
SCOTT Yeah.
SCOTT (garble)
SCOTT See where that frag went?
IRWIN No, I didn't see that.
SCOTT Keep your eye on what I got here.
IRWIN There.
SCOTT Don't lose that one.
IRWIN I see it. Here I'll get the tongs.
SCOTT Get your bag out.
IRWIN Are we going to have time to go down and
sample the --
SCOTT Apparently not.
IRWIN The bedrock.
CAPCOM Stand by for an answer on that, Jim. And
in the meantime, we have a truly magnificent view of the two
of you here.
IRWIN Okay.
SCOTT Joe, this is a -- is a tan fine grained crystalline
rock. I've got to say that because it's got up to 2 milli-
meter glass or plage in it randomly oriented. And the
(garble) matrix is sort of light gray to tan. It's a very well

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SCOTT indurated rock. On the outside, I've got nice glass filled tip and some other pits in it. It's sure solid and sure looks crystalline. It's a beauty. It came from this large block over here 275.

IRWIN You ought to put some of those other fragments that are --

SCOTT Yeah. Let's just get some of the other frags right there.

IRWIN Yeah.

SCOTT Bring your bag.

CAPCOM And that is a beauty. And Dave and Jim. we've got an answer on your question when you're ready.

SCOTT We're ready.

CAPCOM Roger. If you think you can get pieces of true bedrock, we'll be willing to give up mare sampling station on the way back to the LM.

SCOTT I think we can get -- I think right to the --

IRWIN Yeah, to the north of us.

SCOTT Yeah.

IRWIN Yeah.

END OF TAPE

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SCOTT I think we can get - I think right
IRWIN Yeah, to the north of it.
SCOTT Yeah. Right over there I think that is true bedrock. It's just too massive not to be. Okay, that one is too much. Why don't you - here let me hold that frag. Get a scoop for the fines and then - and then put the other frag in the bag too. Up here - that would do -that a boy.
IRWIN Okay. Okay Joe, that chip off the old boulder there was 275. Why don't you zip this one, and I'll get oh man seven bags. Let me get a bag off of you there.
SCOTT Okay. Sure miss having two cameras.
IRWIN Yeah. Slow us down. Little ones here, and 278.
CAPCOM Copy that. And out of sheer curiosity how far back from what you would call the edge of the rille are the two of you standing now?
SCOTT Well, I don't know - from where the - about 50 meters from where I guess we'd say we see real outcrops.
CAPCOM Rog, Dave, and how far back from the lip of the rille do you think you are probably standing?
SCOTT I can't tell I can't see the lip of the rille.
CAPCOM Okay, it looks like you are standing on the edge of a precipice on TV that's why we're asking.
SCOTT Oh, oh, gosh no, Joe, it slopes right on down here. The same slope. It's just a little inflection here. GARBLE in here. Get your after pictures too.
SCOTT Okay.
IRWIN Get a little closer so you can get that big chip out of there.
SCOTT A little closer Jim. Yeah, that's right. Let's go down and get a chunk of the bedrock here.
IRWIN You're going to get the bedrock here huh?
SCOTT Yeah, okay.
IRWIN I thought you were going to press on to the north.
SCOTT Well, he said you'll get the bedrock and I think we ought to try and get it if we can, because it sure looks like bedrock to me. I looked at the rille or down the rille to the south and it's just a - one great big massive layer of the same kind of fragmental debris on the order of meters, quite well rounded.
IRWIN Yeah, but the thing that bothers me Dave, is look to the north there and there's a flocked area there, looks like it might be the top of the bedrock and those blocks are - seem to be slightly different, a little darker.
SCOTT Almost have to GARBLE.
IRWIN Look to the north here.
SCOTT Yeah I see what you are talking about. Come on down here let's get a frag off of one of these boulders

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SCOTT and then we'll head on back to the Rover.
IRWIN That's a good one.
SCOTT Did you get the GARBLE from over here, Jim?
IRWIN On that side, okay.
SCOTT Yeah.
IRWIN That's for the picture.
SCOTT Yeah, standby. Hey, Joe, these rounded fragments down here on the order of meters in size expose some very large oh two - three centimeter vesicles, rather than the finer stuff that Jim saw back there before and I believe when I take a chip out of this we're going to find it's the same kind of crystalline basalt and they are all - well there's some angular - looks like they have been weathered, fairly clean on the surface and all buried and I can look down to the south and it's just a whole mass of great big boulders along the terrace here. And there is another break off down at the end of the rille and I'm - I guess we're just about at the lip.
CAPCOM Amazing.
SCOTT I have the pictures. Beautiful stuff. Okay, I've got them all located, in bag 281.
CAPCOM Roger.
SCOTT Okay. I've got them located.
IRWIN Right here Dave. Right under my -
SCOTT Yeah that's right. Okay.
IRWIN Okay this is a - looks like a darker, fine grained, black vesicular basalt with vesicles on the order of millimeters, nonuniformly distributed - there are a mass of plagioclase about 3 millimeters long and it may be a half a millimeter wide, randomly oriented throughout, and that's about the only other mineral I see. And that - did you get the number on that, Jim.
IRWIN Yeah. I gave it to them.
SCOTT There is one other frag down here and it fell. I got it. Let me get a couple around it.
IRWIN Ones here too, just on the surface. I can't tell what that is but we'll put it in anyway as representative of surface material, this fragmental surface.
SCOTT Okay, why don't you zip that one. Here let me zip it and you can take the after picture Jim.
IRWIN Okay. Boy it hurts not to have two cameras.
Oh, well. Ah, damn it. Cover up what I just did.
SCOTT Okay. I have it.
IRWIN Okay. Tell them that was 281.
CAPCOM Roger we copied and Dave when you finish this, we'd like you to move back towards the rover.
SCOTT Yeah, I think we ought to do that.
IRWIN Let me stick the hammer on you.
SCOTT Boy what a rock.

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SCOTT I just wonder if that rock to the north up there is the same.

SCOTT I know but -

IRWIN Maybe we could stop there for the - maybe we can stereo pan.

SCOTT Okay, let's head back to the Rover.

CAPCOM Right on Dave and we want a rake sample near the Rover, at the soil sample with that and the double core please.

SCOTT GARBLE infinity, F8 to infinity and maybe take another one up here another 15 or 20 meters or so. Get a good stereo down to the south. Hold until we get back to the Rover to talk about the rake sample, Joe. Because you will just have to tell us again.

CAPCOM That's fine, Dave, sure will.

SCOTT We can see a boulder exposed to the surface here which has got layering within it, it's been weathered away, apparently and just the surface top was exposed but the boulder must be oh, about a meter long with 2 to 3 inch layers. Get a picture of that where I stopped, Jim, just a quicky cross shot. See where that thing is exposed - there.

IRWIN Oh, yeah there - beautiful. Dave I think a cross sun stereo would be neat right there.

SCOTT Okay.

IRWIN Yeah, as a matter of fact I'll drop the gnomon that'll tell them what it was. Just to get a real quick picture. Oh, you are kicking up white albedo.

SCOTT Yeah I know.

IRWIN That's the only place I've seen it. Get a little closer, huh?

END OF TAPE

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IRWIN Let's get a real quick picture.
Oh, you're kicking up white albedo.
SCOTT Yea, I know it.
IRWIN It's the only place I've seen it.
Get a little closer. Okay, good.
SCOTT To bad we don't have time to pick some
up, but we'll get probably pieces.
IRWIN Good footing.
SCOTT Okay Joe. Say again your rake
requirements, they're different from others.
CAPCOM Negative, no different Dave, just a few
frags using the rake if you think it's resonable.
SCOTT Yea, I think there's probably good statistical
samples to be had here.
IRWIN Go partner.
SCOTT Yea, why don't you hand me the camera.
That's right.
IRWIN Okay, yea I will. You can take the
pictures.
SCOTT Yea.
IRWIN What are you raking? Take it off, it would be faster.
SCOTT Okay.
IRWIN Pick a spot, I'll rake.
SCOTT Why don't we take a few steps down Jim.
Okay.
IRWIN So we get where there's more.
SCOTT There are more frags down here I think.
IRWIN They're a bit large, large down there.
SCOTT Alright here.
SCOTT It's a good spot.
IRWIN All down the hill. I think I'll rake
down hill.
SCOTT Yea. Make it easy on yourself.
Just a minute, let me get the (garble) down here.
IRWIN Yea. Have at it partner. I'll pick us
out a rock to go when we leave here. Get up to north twin and
there's a nice out crop up there.
SCOTT Okay, I need a bag.
IRWIN Yes sir.
SCOTT Okay 282.
IRWIN Oh gee, I just walked right into your
area. Sorry.
SCOTT Oh you can (garble)
IRWIN Fix it.
SCOTT Oh yes.
IRWIN Vesicular basalt.
SCOTT Do it again.
IRWIN Okay, I'll try to avoid that larger one there.

SCOTT Yea. I think I've kicked up some more light colored albedo. I think if we have some time when you get through, we ought to make a quick trench here maybe. It looks like maybe the upper couple of inches might be, be dark gray and below the very light gray albedo. Okay, there are two swaths about a meter long and one rake width wide.

CAPCOM Okay, Davey. And are those frags?

SCOTT It looks to be down about oh I'd say, yea.

CAPCOM Out standing.

SCOTT That I have in my hand, yes, they are. He's getting about oh 8 to 10 in each one and it seems like there's a fair variety in there.

CAPCOM Wouldn't be at all surprised.

SCOTT Yea. Do it once, let me move the gnomon here. We'll, they can reconstruct that. Take another swath over here so -

IRWIN It looks like we can take two swaths if you want.

SCOTT Yea, I think we're getting some here. Yea. Yea, it looks like you're getting a good 2 to 3 inches down as you rake through there.

IRWIN I'm hung up on a large one here.

SCOTT Yea, that's right. Okay.

IRWIN Alright take another one. Take one more, and we'll fill the bag. Hey Joe, how about a quick single core here.

CAPCOM Yes sir. Maybe even a double core. We think you can probably drive two of them.

IRWIN Okay. I think we probably can too. I was just giving you a little bait there.

CAPCOM Roger, a piece of cake compared to that drill.

IRWIN Even I can agree with that Joe.

SCOTT Good, good comprehensive sample. Now we need some soil. I think that's probably the best one they'll see.

SCOTT Okay. Soil. Okay, let's get one more load. There's a big rock in there.

IRWIN Okay, there you go. Okay.

SCOTT Okay, maybe one more.

IRWIN Let's get a whole bag full.

CAPCOM A comprehensive to end all comprehensive.

SCOTT Yea, I think this is a number 1 kind Joe. You can hold on to that or you can put into my pack while I zip this.

IRWIN Okay.

SCOTT 283 for the soil.

IRWIN Did you give him the number for this one?

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SCOTT Yea. Good. Close it up. Hey, wait a minute and here I'll hand you this one, and the other one too.

IRWIN Okay.

SCOTT Here, I'll get yours. Okay, let me get the pictures.

IRWIN Listen, I'll go and take the rake off.

SCOTT Yea.

IRWIN Then set up for the core.

SCOTT Yea, good idea.

CAPCOM Sounds good Jim.

SCOTT And Joe you can remember on this particular sample that I moved the gnomon about 2 feet, so Jim could get a 1, 2, 3, 4, I guess we got 1, 2, 3, 4, 5, swaths there.

CAPCOM Roger.

SCOTT About a meter each. But you know, I don't know a double core - we may find ourselves driving into bedrock if we're not carefull.

IRWIN Yea, I'm afraid of that.

IRWIN Give it a go.

SCOTT Okay. There's a nice crater here. On the edge. Maybe we hit the rim of that crater.

CAPCOM Sounds good Dave.

SCOTT Hit the rim of the crater Jim. I bet we could do a good one right there.

CAPCOM Rog. Dave, sorry, bad information I gave to you. I guess we'd prefer it away from the rim.

SCOTT Yes sir. Okay.

CAPCOM And if you hit bottom you've hit bottom.

SCOTT the lower side of the -

SCOTT Okay let's right here Jim. This ought to do, get us anything. I'll grab the core while you take the pictures.

IRWIN Yea.

SCOTT Both of them.

IRWIN Grab one at a time. Let me get the other.

SCOTT Yea, put one on and I'll take the pictures and then I'll -

IRWIN Yea.

IRWIN Okay, I have a number.

SCOTT Okay. And it's a little, maybe we can do it here.

CAPCOM Jim, did you call the number.

IRWIN 09.

CAPCOM Thank you.

IRWIN 09 or 60.

CAPCOM Oh, we'll figure it out.

IRWIN No, that light colored albedo normally occurs on the lower, the lower rim or the down hill rim.

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SCOTT Yea, go ahead Jim. Get the other core.
You're right. I have it if you will pull the bag in.
IRWIN Okay. Yea (garble)
SCOTT Here's the hammer.

END OF TAPE

CAPCOM Jim, did you call the number?
 IRWIN 09.
 CAPCOM Thank you.
 SCOTT Okay, let me get ready to take your picture.
 IRWIN It's in position.
 SCOTT Okay, I have the picture.
 IRWIN Push it.
 SCOTT Good, I'll push a little more.
 IRWIN Yeah
 SCOTT Got a half a tube. Good, now you got 3/4.
 IRWIN It feels like it's hung up on a rock.
 SCOTT Okay, I got the picture. Go ahead and hammer.
 IRWIN Blocked huh?
 SCOTT No, it's going in. You're getting it. There's
 a full core. You're getting a couple inches a stroke - very
 nice. There's 1/2 - good, doing good.
 IRWIN Change arms here.
 SCOTT Notice when you hit it, the whole ground around
 it raises up for about an inch away from the core. You've got
 about 3 more smacks and you ought to have it all the way in.
 SCOTT Hey, good. I'll give you a double core on
 that. Good show. Okay, I got the picture.
 IRWIN Very lucky.
 CAPCOM Better check off the double core square on that
 one, Jim.
 SCOTT Okay, I got the cap, go ahead and pull back.
 IRWIN These are ones where I can push them in, Joe?
 SCOTT Atta boy. I think you got a good one.
 IRWIN Yeah, we went right through a rock. No wonder
 it was hard pounding.
 IRWIN A rock right in the bottom of the -
 SCOTT Might clean it off so you get a good seal on
 the can.
 SCOTT Get a good seal?
 IRWIN I'm not going to get too good a seal cause it
 took a portion of the rock you know.
 SCOTT That's what I mean, if you could clean that
 off. I think we got a good seal.
 IRWIN Okay. Oh yes, take off your end and I'll
 ram it.
 IRWIN Okay - all my tools here.
 SCOTT Okay.
 IRWIN Push the rammer, will you?
 SCOTT Good. Ready?
 IRWIN Get it tight, holding this in and lets see if -
 SCOTT Oh, good. Now hold mine and you pull yours off
 easy and I'll get you a cap.
 IRWIN Hold that end.
 SCOTT Yeah. Screw this off.
 SCOTT Is it?
 IRWIN Sure.
 SCOTT Let me get you a cap, here. Here's your
 cap. You got 2 hands full. Okay.
 IRWIN (garble) I'll pound it on.

IRWIN I got it. Okay.
SCOTT I can't get that cap on any more than that.
SCOTT That one?
IRWIN Hey, we've got 2 handy dandy tools here -
SCOTT Hold this, I'll put them both - okay.
CAPCOM Standing by for the number on that before you
tock it away.
IRWIN Okay, 4 - that was - let's see 4 was the
lower and 60 was the upper.
CAPCOM Thank you Jim. Copy.
SCOTT Which one did I hand you? I know 60 was the
top one.
IRWIN Yes, you put that on first - right.
SCOTT Yes.
CAPCOM Dave, while you're getting loaded up there,
our next request is 2 undocumented 6 inch blocks and then
we'll want you on the Rover driving north.
SCOTT Okay, Joe.
SCOTT That's your picture. We're all loaded up. 2 un-
documented 6 inch blocks.
IRWIN We've got a choice on that.
CAPCOM Roger. Just for variety.
SCOTT It's a vesicular one. Here's a good
vesicular one.
IRWIN I've got one that was -
SCOTT You got one that's vesicular or not?
IRWIN Yeah.
SCOTT Huh?
IRWIN Yes, I do.
SCOTT Okay.
IRWIN I don't know if we ought to be too selective
here if we're supposed to move on.
SCOTT Okay.
IRWIN Oh, me. Want me to come down, Dave?
SCOTT Got a good one.
CAPCOM I guess so.
SCOTT It was a little better then 6 inches, but
it was neat looking.
CAPCOM Well, that makes up for it.
IRWIN I'll probably move that camera over on your
side, Dave so we can put rocks in that side.
SCOTT My sides full.
IRWIN Can't put my camera over there, huh?
SCOTT Nope. There's room in your -
CAPCOM Dave and Jim, we want you to climb aboard
now and head north about .3 or .4 clicks by the easiest route
and we'll pick up the stereo pan with the big camera.
SCOTT Okay.
CAPCOM And Davey, we suggest you take those big
camera pictures of the same items you photographed before and
Jim, you can get the pan.

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IRWIN Here, let me just get my camera down. (garble)
120 on the frames on my camera here.
CAPCOM Copy. Thank you.
CAPCOM Dave, we also need the TV camera turned off
this time, and see if you could brush the top of the camera
with your glove, please. It's getting very warm. I'm sorry,
that bad input, brush the top with the brush.
SCOTT (laughter)
IRWIN I'll get the brush. Jerry's quick today on you,
isn't he?
CAPCOM He's sitting on me.
IRWIN Get in and then I can brush the - I can brush
and tie you in -
SCOTT Well - if you will help me in.
IRWIN We're not going that far, Dave.
SCOTT Yeah at .3 of a click, let's get in. I want you tied in.
SCOTT Joe, the top of the camera has virtually no
dust on it whatsoever, the LCRU does, but the top of the camera
is almost clean.
CAPCOM Okay, thank you.
SCOTT I think we're just getting to a high sun
angle.
CAPCOM Might be right.
IRWIN I think so too.
SCOTT I feel a little warmer today than I did yester-
day.
IRWIN Yes, I do too, as a matter of fact. You're
right.
IRWIN Hey Joe, your TV's going off now.

END OF TAPE

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SCOTT Okay. I'm strapped in and you're strapped in; see if I can get the switches on here. Okay, Joe, now you're going to have to say again where you want us to go.

IRWIN Just north, Dave, along the side of the rim.

SCOTT I think you said something about three-tenths of a click.

IRWIN Yeah.

CAPCOM That's affirm Dave; just three-tenths to four-tenths of a click; via of the easiest route north and all we need is the photography from the point where you stop.

SCOTT Okay.

IRWIN Tell me when you get to 2.8, Dave, distance.

SCOTT I'll let you know, okay?

CAPCOM And, troops, what you're picking up is just the base for the stereo photography.

SCOTT Right.

IRWIN It's fairly easy driving here, isn't it?

SCOTT Sure is. It's a lot easier than the other place.

IRWIN Yeah.

IRWIN Fairly good soil; we're doing about 8 clicks.

SCOTT Look, there's a big one.

IRWIN We're heading 310 to 320.

SCOTT You don't want me to roll over that big one there, do you?

IRWIN Please no. (laughter)

IRWIN Take it easy on the old rover. Get a good trade-in value on it.

SCOTT Yeah. How much further we got to go? I got to plan where we're heading here.

IRWIN About another two-tenths to go; I'm reading you. Okay 7 - oh, another click, Dave, say maybe up by that large block at 12:00 o'clock.

SCOTT Yeah.

IRWIN If you can negotiate that?

SCOTT Gee the one with the great big vesicles in it.

IRWIN Notice that fresh one that's just this side of it looks like a light color, almost a yellow ray that extends to the west of it.

SCOTT No, I can't now. I'm busy driving.

IRWIN Yeah. (laughs)

SCOTT (laughs) Oh and keep talking.

IRWIN Very fresh crater right on the rim of it.

SCOTT Oooo, look at this. This is one of the Twins.

IRWIN Yeah, it probably is, yeah.

SCOTT Hey, we're right at it, and it's a deep fellow.

IRWIN Let's keep a little momentum going here.

SCOTT Yeah.

IRWIN There's a flat part over there to the left.

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SCOTT Yeah.
IRWIN Look at that great big one.
SCOTT That vesicular one there looks exactly like - uh oh - guess what we just lost again; the front steering. Oh, I know what there; turn the switch on, it works a lot better.
IRWIN We're at 2.8, Dave, so getting close, huh?
SCOTT Yeah. Let me get to this level spot over here. Okay. Looks like the rim of the Twin there would be a great place to take a pan.
IRWIN Either that or over on those rocks over at 11 o'clock.
SCOTT Yeah, maybe; maybe. Or go to the rim of the Twin there.
SCOTT Okay. We've stopped, Joe.
CAPCOM Okay, Davey, thank you.
SCOTT Yeah.
IRWIN Okay, heading 310 093 028 020 90 92 102 and 110.

CAPCOM Okay, Jimmy, thank you. And thinking downstream, here, all we need is photography from this stop and we're looking towards arriving back at the LM in about 45 minutes.

SCOTT Okay.
IRWIN Shoot. No time to go to the Northern Complex, huh?
SCOTT Do you want TV, Joe?
CAPCOM Yes, please.
SCOTT You got it.
SCOTT Hey Jim upon the - upon the rim. Move over here to the rim.
IRWIN Okay, at the rim of uh -
SCOTT Yeah. Let's go to the rim, then you can get one of the crater and you can get - all over the place. And I can take the 500 from up there, too.
SCOTT Okay, Joe, the crater is very uniform; it has debris on the order of - oh a foot or so almost throughout, no accumulation of talus at the bottom and it's got fines covering everything; nothing really sharply exposed, And most of the fragments are subangular and it looks like nonvesicular, although I do see one high vesicular one right in the bottom, And it's about 60 meters across and maybe - oh 10 meters deep; smooth sides and a very slightly raised rim.
IRWIN Dave let me - oops.
SCOTT I'm sorry.
IRWIN I'll just complete this.
SCOTT And, as craters go around here, it's deep.
CAPCOM Jim, are you taking your pan, now?
IRWIN Yeah. Pan's complete.

CAPCOM Beautiful and maybe you could get us some
(garble)
IRWIN (garble)
IRWIN Oh, okay. (laughs). Looks like you're
looking back at Earth.
CAPCOM Yes sir and our backs are killing us here.
IRWIN But there's a large block there just to
the north of that, Dave. It looks like it might have con-
tact in it between a dark, very vesicular basalt and that
light colored tan.
CAPCOM Thank you sir.
CAPCOM And, Dave, are you firing off the big
camera?
SCOTT Yep.
IRWIN I've got an angular fragment here, subangular
about 4 feet by 5 feet and the vesicles on - that are facing
to the southwest are very large vesicles about 3 inches -
2 to 3 inches in diameter.
CAPCOM Amazing. Amazing.
IRWIN A gradual - -
CAPCOM Leave it there, though Jim. The rover's
not dressed for it.
IRWIN - - trend. A gradual trend this - oh I'd
love to bring it back. I guess I'll just take some closeups
there.
CAPCOM Yes sir! Please!
IRWIN Got the tongs?
SCOTT Oh you've got your thing here - -
IRWIN I don't have my (garble) ball; I'll estimate
it.
SCOTT Uh, it won't work.
IRWIN There.
IRWIN Just to the north of this - the large one
I just mentioned, there are two other large frag -

END OF TAPE

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IRWIN Just to the north of this, the large one. I mentioned there, two other large fragments and there's a fracture right between them and they also have the large vesicle pattern.

CAPCOM Rog, Jim. Copy.

IRWIN We already sampled this. And the material that has the large vesicles has a long glass of probably plagioclase.

CAPCOM How long, Jim?

SCOTT What's a (garble)?

IRWIN A long (garble) about centimeter.

CAPCOM Roger, Jim, we copy that, as much as we hate to, we're going to get you aboard the rover. Head on back across the mare towards the east, please.

IRWIN Okay.

SCOTT (garble) is 155.

CAPCOM Good show, Davey.

IRWIN Getting ready to move out, Dave?

SCOTT Yeah.

SCOTT Leave something here for the next guy.

SCOTT Okay, hop on then we'll get on with it here.

SCOTT Joe, handy dandy seat belts fixed up here because we'll be going all the way back.

IRWIN Yeah, hop on.

SCOTT Okay.

SCOTT Okay, the TV is coming off.

IRWIN And TV camera (garble).

IRWIN Unlock that seat belt off, Dave, I have to get off.

SCOTT I'll get it.

IRWIN You can't.

SCOTT Oh, really? Okay, hop off.

SCOTT Jim, let me get it and hold it.

IRWIN Okay, Dave.

SCOTT Just a minute.

SCOTT Too much back, Jim. You go back too much. Come to your right now. Come to your right now. Come to your right.

SCOTT That's it. Now you're in.

SCOTT Can;t get too far back when you get on.

SCOTT Okay, you're in.

SCOTT Hey, Joe. Are you planning a mare stop on the way back?

CAPCOM Dave, we're standing by for a mark when you're rolling and we'd like for you to press on back towards the drill site we've got a procedure for you to -- to separate two sections of the deep stem from the other two sections and we're going to carry the two halves in to the LM that way.

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SCOTT Okay.
CAPCOM And the mare site, Dave, we will do a good
mare site but fairly near the LM.
SCOTT All righty.
CAPCOM Are you buckling up for safety?
SCOTT Yeah, man. We always do that. Switch coming
on.
SCOTT Okay, Joe. We're moving.
CAPCOM Okay.
IRWIN Right to 093, okay?
CAPCOM Sounds about right and you might pick up
your rover tracks before long.
SCOTT Boy, what a big mountain that Hadley is.
IRWIN Yeah, it's beautiful.
IRWIN You might want to swing a little more to the left,
here, Dave.
SCOTT Yeah. Let me go around this. I'm
sure we can get through two craters ahead of us there.
IRWIN I think I'll come this way.
IRWIN Yeah, the mountains up here are truly beauti-
ful.
CAPCOM Rog, Jim. We copy you loud and clear.
SCOTT Okay, now, to the right.
IRWIN 2097, Dave.
SCOTT Okay.
IRWIN A friendly swallow depression there at
(garble).
SCOTT South of that.
CAPCOM Jim, this is Houston.
SCOTT Just over hill and dale, isn't it?
IRWIN Yep.
IRWIN Go ahead, Joe.
CAPCOM Roger. If you can take your eyes off the
separation procedure if you'll like it now.

separation procedure if you'll like it now.

IRWIN Fire away.

CAPCOM Roger, your choice. I can give you the pro-

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CAPCOM Okay, Dave. Copy that. It may also be that it's quite dusty and the brush might help you out there.

SCOTT Okay. We'll try that. Didn't try that.

CAPCOM And to set your minds at ease, we think that even if you can't separate it into two pieces, we can get the whole thing into the LM. So, we'll bring it home anyway. We'd like it in two separate pieces, though.

SCOTT I guarantee you we're not going to leave it here now after we got that much invested into it.

IRWIN Looking directly east now as we head back to the LM -- Did you put your visor down?

SCOTT Haven't yet but I think I just might.

IRWIN Like wow, the Sun is really fierce.

IRWIN And I can see as I look to the east several places up the slope. Big rock mountain where their outcrop's exposed.

CAPCOM Roger, Jim. Copy. And the name of the mountain again, please?

IRWIN (garble). That was big rock mountain.

END OF TAPE

CAPCOM Rog Jim. Copy and the name of the mountain again please.

IRWIN (GARBLE) That's was Big Rock Mt.

SCOTT You know Joe. Big Rock-0 Candy Mt.

CAPCOM Roger, we copy. And do we have a big smile here in the MOCR.

SCOTT I'm not going in there Jim.

IRWIN I hope not. I haven't picked up our tracks yet, I think we're probably still a little north of them.

SCOTT Yeah. Because we came 3 tenths north.

IRWIN We're heading 105 range 1.4.

CAPCOM Copy and sounds good.

IRWIN Can't see the LM today.

SCOTT Oh look at the mountains today Jim, when they're all sunlit isn't that beautiful?

IRWIN It really is.

SCOTT By golly that's just super. You know unreal.

IRWIN Dave, I'm reminded about my favorite biblical passage from Psalms. I'll look unto the hills from whence cometh my help. But of course we get quite a bit from Houston too. Okay, we're heading 13, 140.

SCOTT We've got to go around this -

IRWIN Yea.

SCOTT Crater here, buddy.

IRWIN What's your estimate of when we'll be able to see the LM?

SCOTT Who's mine?

IRWIN Yea, do you think we'll be able to see it at 1 killometer?

SCOTT Nope. I think we're going to be going up and down the valley's here.

IRWIN No, I think I see the top of it Dave, at 12 o'clock.'

SCOTT Really.

IRWIN Yea. You can just brarly see the top of it.

SCOTT Okay, you look far range and I'll look near range.

IRWIN Yea. Cause there's our tracks.

SCOTT Yea, we got our tracks. How about that.

IRWIN And the rover is a little black blob over there at about 12:30.

IRWIN That's exactly where the map says it is.

SCOTT I think we could do better going straight ahead on don't you?

IRWIN Yea, I think it's got that one depression over that next ridge. Why not just drive through it.

SCOTT We'll let's see how we do.
IRWIN Say, wasn't that the deep one though
that had the crater in the lower part.
SCOTT heading 093 and heading 08, so coming
right is going to help us. No, we're okay.
IRWIN Yea.
SCOTT Okay.
IRWIN Yea, this is a better route than we
used coming out.
SCOTT Yea. would you get, that 16
millimeter camer.
IRWIN I'll change mags on it.
SCOTT Okay.
IRWIN And see if that helps.
SCOTT How about that for maneuvering.
IRWIN Slick.
SCOTT This thing would really be great in
shirt sleeves up here you know it.
CAPCOM Jim, concerning that 16 millimeter
camera, if your changing the mag out, you might try the 1
frame per second trick at the beginning. It worked before.
IRWIN Yea, I did that this morning Joe, on
this mag. It -
CAPCOM Roger, you've got plenty of mags.
keep trying.
IRWIN Yea, we will. By the way, do you
want us to bring back those jammed mags or should we chunk them?
CAPCOM Let me check with span.
IRWIN Boy, look at the huge big boulders
up there.
SCOTT Yea, that's pretty neat. Up on the
slope of -
IRWIN Yea, it's appropriately named don't you think.
SCOTT Yes it is. It's the only one around
here.
CAPCOM Dave and Jim. We think it will be
just as easy for you to bring them back and we'll trouble
shoot them.
IRWIN Alright, we'll do that.
SCOTT Yea, so far in the past our NAV
system is always been biased pointing us to the right
a little bit more than we should, so I'm going to bias it
a tad left here, because I know if we get too far left we'll
pick up our tracks. Noticed on the other two trips when we
got back it was asking us to hit 83 or so to the right.
IRWIN I see our tracks running to the
east there at 12 o'clock position. Just over that next ridge
(garble)
SCOTT Oh yea, your right. We cut a big
chunk out.

IRWIN Yeah.

IRWIN Range now .5.

SCOTT Hey, this shade really helps. It's
no problem at all driving up sun, with the center visor
down. Fact I reckon we're making pretty good time.

IRWIN Going at about 11 clicks there.

SCOTT Yea.

IRWIN There's the LM at 12:30.

SCOTT How about that. By golly we must
have come just about straight back. And the bearing -

IRWIN Yea it's great.

SCOTT says 096 and I'm -

IRWIN Hey, let me take a picture right here.

SCOTT Oh yea.

IRWIN (garble)

SCOTT Yea, let me stop on the rim here,
and point you. Oh isn't that pretty. Okay, a little too
much. Let me get around. There, how's that?

IRWIN A little more?

SCOTT Are you okay.

IRWIN Swing it.

SCOTT Okay. Okay.

IRWIN 056.

SCOTT Yea.

IRWIN That's a super picture. Bring it
a little more to the right and let me take -

SCOTT Sure there you go.

IRWIN a picture here. Got it.

SCOTT Okay.

SCOTT Let's see. We'll go find the ALSEP site.
I think we've been there before.

CAPCOM And Dave and Jim, I want you to notice
how we planned the 4th stop at the ALSEP site for you.

SCOTT Yea, it's got to be a new all time
record. It will probably stand for ever.

CAPCOM Rog, it'll certainly scare the competi-
tion.

SCOTT - - get up here some day.

IRWIN Yeah, we didn't get a chance to get
up to northern complex to see Pluton (garble)

SCOTT I know it.

IRWIN Eagle Crest.

SCOTT Dog gone. All the good places.

IRWIN Yea, the really big surprise was up
there.

SCOTT Jim, I'm going around the north here
and avoid the dust. Our trusty Alsep. Hey that's a pretty
nice picture right there Jim. Let me point you in around there

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SCOTT That's really pretty.

IRWIN Got a mag.

SCOTT No you've got black and white. You
better change that mag buddy. Okay, there you go. Got it.

IRWIN Yea, I'll change it all when we stop.

IRWIN Drive slow, and there's our trusty
drill.

END OF TAPE

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IRWIN Got it.
SCOTT Yeah, I'll change it out when we stop.
SCOTT Try slowing here, there's our trusty drill.
I thought you left it in an erect position.
IRWIN No. No.
SCOTT Friendly plains of Hadley.
CAPCOM Dave and Jim, this is Houston.
SCOTT We stopped, Houston. We're at ALSEP.
CAPCOM Roger, troops. We're thinking that when you ride back to the drill site - Jim, why don't you hop off and pick up the 3 important items there, the drill stem, the treadle and the wrench, and Dave you can drive on back and park by the LM. Over.
IRWIN Okay, give me the (garble) too.
Got it Joe. It worked. Okay, I'll just get the (garble)
SCOTT Yes.
SCOTT Let's see - you have all the other stems in the bag.
IRWIN Yeah.
SCOTT You have the wrench in there, too, don't you?
IRWIN Yes, I think so.
IRWIN If it's not there, I've got it in the bag.
It's not here by the treadle. So all I do is pick up - pick up the treadle.
SCOTT I don't know why we need the treadle.
IRWIN I don't either.
CAPCOM Just take it on back. We might use it as a wrench.
SCOTT Yes, I guess you could. Right.
CAPCOM And that's Walter Mitty plan number 2.
IRWIN Okay, I have the treadle, stems and I'm heading back.
SCOTT Okay, I'm off the Rover, Joe.
IRWIN When I get up there, Joe. I'll give you the readings.
CAPCOM Okay, Jimmy. We're standing by.
CAPCOM Dave, are you arriving at the LM, now?
IRWIN Yeah, Daves been here for a couple minutes.
CAPCOM Okay, sorry. I guess I missed it.
CAPCOM We're standing by for TV, Dave.
SCOTT And the heading is.
IRWIN Rog, Joe. Understood.
IRWIN The heading is 001 032 5.1 08890 108 113
and motor temps are still low.
CAPCOM Copy, Jim. Remarkable (garble) system.
IRWIN Sure is.
IRWIN Okay, AGC says you should have it, Joe.
CAPCOM Okay.
IRWIN Dave, are you going to use that camera?

SCOTT Yes sir.
IRWIN Okay, cause I want to - we never have taken any dust pictures of the Rover.
SCOTT I'll do it right now.
IRWIN Give me 2 cross sun and 1 down sun.
SCOTT Okay. An AF 11, 1 250 at 11 feet.
IRWIN All the way, huh?
SCOTT Yes. And also, I'm going to take a photograph of the solar wind.
IRWIN Okay. I'll get it.
CAPCOM And we need some help on our camera, Dave.
IRWIN I guess we kind of follow the checklist here, for awhile, huh?
CAPCOM Jim, that's affirm, but we want you to break down the core stem first, please. That is, separate it.
IRWIN Boy, the crew will break down, the stem never will.
SCOTT Okay, I got a pan of the Rover. Get that stem there. Jim, keep going the way you're going. Okay, the stem. Don't bother with the treadle yet.
SCOTT Oh, shoot, the tool isn't in there. Must be in your seat. You didn't see the tool out there?
IRWIN No. All I saw was a UHT.
SCOTT Must be in your seat then.
IRWIN Is it?
SCOTT Let's see -
SCOTT Oh, shoot, I don't see it.
IRWIN I'll look out there again, but the only thing I saw was a UHT lying on the surface out there. Did you have a UHT in that area?
SCOTT Yeah.
IRWIN Yeah, that's all that was out there.
SCOTT But you know, I thought I put the tool in the bag, with the stems.
IRWIN Maybe you did.
SCOTT How could it get out and the stems not get out.
IRWIN How many stems did you have?
SCOTT Two.
IRWIN I don't know, Dave.
SCOTT I don't know either. Maybe we'll have to use the treadle. It's not on my side either. Darn. Man that's hot. I'll tell you what - the treadle -
IRWIN You want to hold it and I'll get on the end of the (garble)
IRWIN Okay.
IRWIN How are we going to get the treadle over the cap though.
IRWIN We'll have to come in from the other end.
SCOTT No, the other ends got the same kind of cap, Jim. I don't think I can get it through the hole with the cap on.

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IRWIN I'll take the cap off and do it gently. I'll put the cap back on. Let's see which way should the treadle - that's right. I guess it -

SCOTT No, don't do that - don't do that - we'll never get the treadle on. No, don't put the treadle on. Never get it off. We've got nothing to get it off with. Back off. Pull treadle off. Best thing. - Joe, will this stem fit in the LM some place?

IRWIN I think it will.

CAPCOM We think so, Dave.

SCOTT I think that's what we're going to do. We're going to take the stem with us just like it is. I think if we try and fiddle with it, we're going to mess it up.

CAPCOM We hear you, Dave. And our camera is (garble) again.

SCOTT Okay. Now.

IRWIN Get it?

SCOTT I got 1 off. Okay, I'm going to work with a 16 here and see what I can do.

IRWIN Good.

CAPCOM What did you do, Dave?

IRWIN I'll tell you - my hands -

SCOTT Well, Joe, I just decided it was time to take that drill apart and I took it apart.

CAPCOM That sounds easy enough.

SCOTT So, now we have a 3 stem section and 3 1-stem sections.

CAPCOM That ain't half bad.

END OF TAPE

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CAPCOM sounds easy enough.
IRWIN So now we have a 3 stem section and three 1 stem sections.
CAPCOM That ain't half bad. Dave we're standing by for a bag number on that and Jim we need some help with the camera.
IRWIN See what this one is here. Hotel is the upper part of the 3 stem session.
CAPCOM Copy.
SCOTT Those caps aren't on there very good, Jim so be awful careful of it, awful careful.
IRWIN Put it in the bag. I can't.
SCOTT Oh, I see what you mean, yeah.
IRWIN That one. The first is mag Alpha.
CAPCOM Dave bag 2 for that short section and Jim we need help on our tv camera, please.
SCOTT Okay, I'll get it Jim. You try and get that 16 millimeter working. You guys have almost lost control on this camera, haven't you?
CAPCOM Dave point it down - Please.
CAPCOM Thank you.
SCOTT Joe all pointed down.
CAPCOM It's okay, Dave, it's okay now.
SCOTT How far do you want it. How about that.
CAPCOM It's okay Dave.
SCOTT Boy I tell you what I need now is some gatorade. Wow, I could drink three gallons of the stuff. I opened up my checklist and look at all that work and that reminds me
CAPCOM Dave and Jim this is Houston.
IRWIN Hey Joe I have mag golf on here now. Go.
CAPCOM Roger, we need a EMU status check from both of you and we're five minutes from close out. All we need is a few graph sample.
IRWIN Okay, I've got 50 percent. The flags are clear at 3.9.
SCOTT I'm 3.85 flags are clear and I'm reading 50 percent.
CAPCOM Thank you Jim and Dave. Got it.
CAPCOM Okay troops we're asking for the undocumented sample to go into the B-SLSS bag, please.
IRWIN GARBLE run them all in one frame per second. We need a temp check comment Joe.
CAPCOM Rog, Jim, I'm sorry I cut you out, asking that the undocumented sample go into the B-SLSS bag.
IRWIN Okay.
SCOTT We'll do that.
IRWIN Just grab a bunch, huh?
SCOTT Hey Joe how about bag- oh well okay - B-SLSS
IRWIN Joe, when I start the camera it runs for about

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IRWIN 3 seconds and then stops.
CAPCOM Okay, Jim we copy that. Thank you.
IRWIN I can put on another mag if you like.
CAPCOM Negative, Jim. I think we should just go ahead with your other tasks.
IRWIN Okay.
CAPCOM And Jim we've got another question on topography for you. We would like a picture of the Rover saddle which hung up on original deployment so do you think you have one of those already.
IRWIN No, but I'll go get one Joe.
CAPCOM Okay, sounds good.
IRWIN Right now.
IRWIN Dave we have everything in this bag that you are going to put in it, right? In this bag here.
SCOTT Yeah, but how about the rocks under the seat.
IRWIN I wanted to put those in there that's why I wanted to get the right bag.
SCOTT Yeah, that's everything I've got.
IRWIN Well we've got the SES SESC in here that has not been used - of course there are remaining caps.
SCOTT Okay I'm working on the bag 2 now, Joe. Taking the caps out of it that we have not used, I've got an SESC here that hasn't been used and then I'm putting the rocks, the samples that are under my seat in bag two.
IRWIN Hey, Joe I got your picture of the saddle, a couple of them.
CAPCOM Okay. Fine.
IRWIN What else would you like? Did you document this large one Dave?
SCOTT Sort of.
IRWIN Okay, I'll try to get it in this bag, then. It'll be a heavy bag. I think I'll wait and put that in the B-SLSS bag.
SCOTT Okay.
IRWIN I've got to get the tool - whenever you are ready I'll get the tools off of you. I'll be packing ETB in the meantime.
SCOTT Okay.

END OF TAPE

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SCOTT I'm gonna get the tool - whenever you're ready, I'll get the tools off for LB pack and the ETV in the meantime.

IRWIN Okay.

IRWIN Got to go over and get the engine bell sample.

SCOTT They want to get that?

IRWIN I guess so; I don't know. Isn't that part of the closeout?

SCOTT Yeah. But I heard you ask him; I didn't hear any answer.

CAPCOM Dave, that's affirm. You just should be following your checklist for closeout, now.

SCOTT Okay. Okay, I'm ready to -

CAPCOM And we're plenty comfortable on the time; you're allotted the time, Jim.

SCOTT Yeah, but I want to get the descent engine sample first.

SCOTT Okay. Let's get the descent engine sample, Jim.

IRWIN Okay, well I don't need my bags for that.

SCOTT Nope. I've got a bag, if you'll get the

--

IRWIN I'll get the SCSC.

SCOTT Yeah.

IRWIN You got a scoop?

SCOTT Yeah.

SCOTT We had to do so much work around the rover, there's hardly a spot that's not messed up.

SCOTT Okay.

IRWIN I'll get the pictures.

SCOTT Okay. Need to fill that little jewel.

IRWIN Fill it.

IRWIN Don't spill it, I want to get the top for it.

SCOTT I won't.

IRWIN (garble)

SCOTT Okay, scoop up the top layer there right next to the one you just scooped. And can you put the top half inch or so.

SCOTT Okay, that looks good, Jim.

SCOTT Okay, I can take care of the rest. Take that back.

IRWIN Or you can just put it in my bag, that's where it supposed to go.

SCOTT Okay.

IRWIN Oh boy!

SCOTT Gold (garble)

IRWIN Save your DSKY finger.

SCOTT Yeah.

SCOTT In we go.

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SCOTT Boy, they sure make them tight.
SCOTT Okay. It's your baby.
IRWIN Got it in?
SCOTT Yeah. Okay. I'll take the - -
IRWIN I'll move off.
SCOTT Jim, give me your scoop; while you're
moving give me your scoop and I'll bring it over to you.
IRWIN Okay, listen. You're going to keep that camera for
awhile.
SCOTT Yeah.
IRWIN You take the - a down front of the solar
wind, for me.
SCOTT Yeah. Sure.
IRWIN Got the LM in at 7 feet.
SCOTT Okay.
IRWIN I'll collect it.
SCOTT Okay.
SCOTT Let's get going.
IRWIN Go ahead. You've got to get there first.
SCOTT I know. I'm just right behind you.
IRWIN Oh good. I was waiting for you to pass
me.
SCOTT I'll tell you, it's a high sun angle, it's
warm isn't it?
IRWIN It is.
IRWIN You know, to collect these large rocks,
Dave, if we had time, you could almost use the rover to drive
out there.
SCOTT No, I don't think we have time.
CAPCOM Jimmy, we've got plenty of rocks.
SCOTT Okay, down sun.
SCOTT Okay, (garble) good? I got the picture.
IRWIN Okay.
IRWIN So much stuff there is on this --
SCOTT Say again.
IRWIN How much stuff there is on this sun screen.
SCOTT Yeah, sure is, isn't it.
SCOTT Okay.
SCOTT Okay, Joe, well, Jim's getting that over
to load the ETV.
CAPCOM Okay.
SCOTT And I've got this --
IRWIN It's not rolling up very well Joe, I've got
to roll it up manually.
CAPCOM Sounds okay, Jim, just as clean as possible.
SCOTT Whiskey in.
IRWIN Okay.
SCOTT Okay, Joe Whiskey Sierra, Victor - Do you want
any of the 16 millimeters to stay out or are we through with those?

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CAPCOM Dave, you might save one for the drive away
and put the rest in the ETV, please.

SCOTT Okay. Union and I'll save Item - this
would be a good item for the drive away.

CAPCOM Okay.

SCOTT Juliet and Hotel and Kilo and Foxtrot.

SP, The maps,
IRWIN I'm ready to get the tools off, Dave, any
time you are.

SCOTT Okay. That's a good time to do it. So
am I.

IRWIN Okay, the solar wind is MESA table.

SCOTT Okay, Heck, we don't have to do anything;
let's just take a walk. Picture of (garble)

IRWIN Yeah, I'm taking it.

SCOTT Okay. Turn around and I'll get your bags,
the other way. Oh me. Okay, right there.

SCOTT Okay. (garble) did you get a dover, Jim?

SCOTT Okay, there's your bag.

IRWIN Got it off?

SCOTT It's off; you're clear.

IRWIN Say, I guess we might be able to consolidate
the contents of both those bags into one.

SCOTT That probably would help.

IRWIN But we can do that inside.

SCOTT Yeah. And then just, why don't you get
mine.

END OF TAPE

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CAPCOM You're clear.

IRWIN Yeah, I guess we might be able to consolidate, the contents of both those bags into one. That probably would help. But we can do that inside.

SCOTT Yeah, and then why don't you get mine?

SCOTT Can you bend over a little?

IRWIN (garble) the two harnesses out here.

SCOTT Yeah, that's a good idea. Why not? See if it works. If you're clear.

IRWIN Okay.

IRWIN Did you put my bag in my seat? Them?

SCOTT Your bag? What bag?

IRWIN Collection bag on the side. Where did you put it?

SCOTT Right here on the seat --

IRWIN No, here it is. Right here.

SCOTT Oh, I see. Put it on the handtool carrier. Give it to you and you can consolidate.

IRWIN I guess those undocumented ones we want to put in the B-SLSS bag. Let me deploy your - it didn't come out - let me -

SCOTT I didn't get the lanyard. It fell off my head.

SCOTT (garble).

IRWIN Okay, it's off. Why don't you get mine?

SCOTT Yeah.

SCOTT Good.

SCOTT You didn't put any rocks in the B-SLSS bag?

IRWIN No, I didn't because they're on the floor there. I just never had a chance to get it up to put in there.

IRWIN Dave, rather than waste time out here, I'm just going to leave these all like they are. I think they are stored just as well that way.

SCOTT I think you're right. We'll put them all over on the MESA table.

IRWIN Okay.

SCOTT We got one little thing to take care of here next on my check list.

IRWIN I'll get the penetrometer drum.

SCOTT Don't worry about that.

IRWIN Okay.

SCOTT I'm going to take care of that other little item here. Just now due.

IRWIN Yep.

SCOTT Maybe you ought to lift up the front end of the rover so you're clearly visible.

IRWIN That's a good idea. Let's just swing it around -- Let me get this side here. Let's just swing it clockwise for about -- Let you grab the handle over there. Let's just swing it clockwise for about 15 to 20

IRWIN degrees.
SCOTT Houston, if you've got your big eye there.
CAPCOM Dave, you going to have to realine our
antenna, please.
SCOTT Yeah. Clever of you to think of that, Joe.
SCOTT Figures.
CAPCOM I had a subtle reminder.
SCOTT You should have it according to my AGC.
CAPCOM Yes, sir.
SCOTT Get one, Joe.
CAPCOM Yes, sir, we have it.
SCOTT Okay, why don't you follow me? Follow me
around to the MESA.
CAPCOM Okay.
SCOTT And turn on your zoom.
SCOTT Just to show that a good postal service
takes care of the mail just about any place in the universe. And
there's a pleasant task to cancel the -- wait till you get
around here. You've got a slow TV today.
SCOTT Meantime.
SCOTT Tell me when you get a good picture, Joe,
and I'll show you something.
CAPCOM Rog, Dave. We're doing the best we can.
SCOTT Okay.
IRWIN If you want Joe, I can help you.
CAPCOM Okay, Jim. We could use it. Ed's whipping
the horses, but it just doesn't work.
IRWIN Okay. be right with you.
IRWIN I'll point your -- point the TV right at Dave.
SCOTT How's that?
CAPCOM Tally Ho.
SCOTT Hold it right there, Houston.
SCOTT Okay?
SCOTT Got a good picture, Joe?
CAPCOM Good picture, Dave. Have at it.
SCOTT Okay. To show that our good postal service
is -- delivers any place in the universe, I have the pleasant
task of cancelling here on the Moon, the first stamp of a
new issue dedicated to commemorate United States achievements
in space. And I'm sure a lot of people have seen pictures
of the stamp. The first one here on an envelope, at the bottom it
says United States in Space, a decade of achievement and
I'm very proud to have the opportunity here to play postman.
pull out a cancellation device. Cancel this stamp. Is
August the second, 1971, first day of issue. What can be a
better place to cancel a stamp than right here, the Hadley
Rille.
SCOTT My golly, it even works in a vacuum.
SCOTT But not too well. But it's the first time

SCOTT so I guess they're just learning.
IRWIN You put a thumb print on there, Dave.
IRWIN Well, the first room left. I've got several
dusty thumb prints. Now, I'll stick this back in a special
mail pouch here and we'll deliver it when we return.
CAPCOM Roger.
SCOTT I think that's pretty good after only ten
years. Here we are spending three days on the Moon. That's
moving ahead.
CAPCOM Dave, this is Houston.
SCOTT Go ahead.
CAPCOM Roger. We're wondering if you could use
that to mail home an ounce of rocks, please.
SCOTT Well, all right. I'll do that. I bet we
could.
SCOTT Now I'll stick this on a ETB. Joe, hold
your camara right there. I'll be right back. There's some-
thing I think you'll find very interesting. It'll only
take a minute.
IRWIN I'll put this penetrometer in the ETB, DMve.
SCOTT Okay.
IRWIN Solar - Solar wind.
CAPCOM Jim, we copied both solar wind and penetrometer
drum in the ETB.
IRWIN Not quite, Joe. I haven't put the solar
wind in yet but I will shortly.
IRWIN I want to watch this.
SCOTT Joe, I've got a good picture there. I've
got --
CAPCOM Beautiful picture, Dave.
SCOTT Well, on my left hand, I have a feather.
In my right hand, a hammer. I guess one of the reasons we
got here today was because of the gentleman named Galileo
a long time ago who made a rather significant discovery
about falling objects in gravity fields and we thought where
would be a better place to confirm his findings than on the
Moon? And so we thought we'd try it here for you. The feather
happens to be appropriately a Falcon feather for our Falcon and
I'll drop the two of them here and hopefully, they'll hit
the ground at the same time.
SCOTT How about that?
SCOTT This proves that Mr. Galileo was correct.
And his findings.
CAPCOM Superb.
SCOTT Okay, let's see. What else do we have
here.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/2/71, 7:57CDT, 167:22GET, 495/1

CAPCOM Superb.
IRWIN Okay. Let's see. What else do we have here?
(garble) 70 millimeters, 500 millimeters, 16 millimeters.
maps.
IRWIN I can get the maps, if you want them. Okay,
the solar wind is in there now, Joe. Solar wind penetrometer
drum.
SCOTT ETB.
SCOTT Nothing like a little science on the moon,
I always say.
CAPCOM Been saying it for years.
SCOTT Okay, Jim, we got it all in the ETB? I'll
seal it up.
IRWIN If - if Joe's happy.
SCOTT Joe, are you happy with our ETB now?
CAPCOM Dave, I'd be happy if you'd police the
area there under the seats and on the console.
SCOTT Yes, I'll do that Joe, for sure.
CAPCOM Okay, thank you.
SCOTT (garble)
IRWIN I don't know what we'll need it for.
CAPCOM And in particular Dave, we're looking for
mags Tango and Romeo.
SCOTT Oh, I'm pretty sure I got them in Joe. I
was reading all that stuff out to you. I hope - got a chance
to copy it all.
CAPCOM Okay. Just check in those seats there
and on the consoles and we're happy.
SCOTT Okay.
SCOTT (garble) the magnetometer -
CAPCOM Jim, a word on that core stem. When one
of you takes it into the LM, you can stow it on the floor
against the mid step, Z27 bulkhead.
IRWIN Okay. Doing a little - the tools here
CAPCOM Dave (garble)
SCOTT The seat pan is in the -
CAPCOM Roger.
IRWIN I'm not reading Joe very well.
CAPCOM Jim, we're reading you loud and clear.
It's okay.
IRWIN Oh, yeah I hit my volume low, that might have
something to do with it.
CAPCOM Dave, this is Houston. When you drive
the rover out to its final parking site, we'd like you to
take the dust brush, please; in fact, both dust brushes please.
SCOTT All right Joe.
SCOTT Okay, I have them both right here right now.
SCOTT (garble)
IRWIN Yeah, I just released it there Dave, it
should come off; had to use the tong.

APOLLO 15 MISSION COMMENTARY, 8/2/71, 7:57CDT, 167:22GET, 495/2

SCOTT Resetting the nav system.
IRWIN Okay, Dave, I'm going to get the gate for
you and you'll be ready to go.
SCOTT Yeah. I got it.
SCOTT Okay, I think we have everything.
SCOTT All set, buddy?
IRWIN Yeah.
SCOTT Okay.
SCOTT Oh ho ho. How about the 16 millimeter mag,
Jim?
IRWIN One that didn't work?
SCOTT It looks like it did. It's got a little
on it.
IRWIN Oh it wasn't driving. I was just checking
it out.
SCOTT I wonder if they want us to bring mag Golf
back. We'd better bring it back.
CAPCOM Jim, you might try that - -
IRWIN I've got one large rock in the beast.
IRWIN Say again, Joe.
IRWIN Try another mag?
SCOTT No, it's too late for that.
IRWIN Yeah.
SCOTT Hey, Jim?
IRWIN Yeah.
SCOTT Here's mag Hotel in your camera, and I
can't get off; you might work on that while I drive - (garble)
SCOTT Hey, hey Jim, would you check my lower hooks
on my PLSS. Are they hooked?
IRWIN I'll check. Yeah they're both hooked.
SCOTT Okay. My OPS on good? Check that.
IRWIN What made you wonder?
SCOTT I bounced, the PLSS bounced a little.
IRWIN Well it looks like you're secure.
SCOTT Okay.
IRWIN Watch your TV cable.
CAPCOM Dave and Jim, for your information - -
SCOTT Okay, Joe I'm getting ready to drive it.
CAPCOM - - the TV camera's gotten so hot that
we've turn it off temporarily, here.
SCOTT Okay.
CAPCOM Okay, Dave, and your nav system should be
zeroed and we're looking for a range distance reading, which
you know.
SCOTT Righto! I'm just about getting on it
right now.
SCOTT Stow your antenna, Joe, for a few minutes.
going TMLWB.
CAPCOM Roger.
IRWIN Okay, I got that mag off Dave.

APOLLO 15 MISSION COMMENTARY, 8/2/71, 7:57CDT, 167:22GET, 495/3

SCOTT Good.
SCOTT Put it in the ETB.
SCOTT Okay. 096;
IRWIN Dave, you're going to bring the dust brush
back with you, then, huh?
SCOTT Yeah. Remind me.
IRWIN I'll wait here for you.
SCOTT And 096; okay, we're Oooo, we almost ran
in the middle of a big crater.
SCOTT Distance one-tenth;
CAPCOM Dave, are you getting off yet?
SCOTT No, I'm driving, Joe. Sorry about that.
CAPCOM Okay fine. A couple of requests: when
you get there, we'd like for you to report on possible dust
condition on the battery mirrors, and we'd also like for you
to tap the amp hour meter just to see if the readings - -
SCOTT Joe, wait - Joe, stand by. Break, break.
Hey, Joe, wait till I get there will you, please. I've got
to concentrate on driving right now.
CAPCOM Rog.
SCOTT Just going to have to repeat it again.
CAPCOM No problem.
IRWIN Oh my! That (garble) just hit the Reset On.
SCOTT No wonder I couldn't find my way. I was wondering
why I wasn't getting anything.
IRWIN Why don't you drive back fast and reset?
SCOTT I will.
CAPCOM Plenty of time Dave, and I should have
called it.
SCOTT But, you know, with the cratering out here,
if you're going to see the lift off, I'm almost tempted just
to take a shot up on a rise here. If I take it right to the
exact spot I'm - -

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET16733 CDT0808 496/1

SCOTT I was wondering why I wasn't getting anything.

IRWIN Why don't you drive back fast and reset.

SCOTT I will.

CAPCOM Plenty of time Dave, and I should have called up.

SCOTT But you know with the cratering out here, that you going to see the lift off. I'm almost tempted just to take a shot up on a rise here. If I talk it right to the exact spot, I'm afraid that you're not going to see it Joe. Because of the depressions in the hummocky and everything. What do you think about that.

CAPCOM Sounds good.

SCOTT I think I'll stay out here and put you at about 300 feet which we are. There's a nice little rise here. And I'll point you, you want to be heading 255. Yea, that's all messed up too. Just slightly Okay. I'll come west. I got a good spot for you Joe. Joe, what's my realitive azimuth that the sun right now with the west.

CAPCOM 30 degrees Dave.

SCOTT 30 degrees okay. I can give you a nice spot here.

CAPCOM Okay, it's about between 30 and 40 degrees.

SCOTT Okay, I think I've got a good place for you. Right upon a rise. We're about 300 feet away. I think you'll like this. Okay. Switches are off. Brakes on. Now tell me what else you wanted to do Joe that was different besides dust.

CAPCOM Okay Dave. Tap the amp hour meters just to see if the readings change.

SCOTT Okay, wait a minute. I'll dust off this LTRU. Camera's dusted and the LTRU's dusted. Tap the amp hours. And the amp hours read 83 and 90.

CAPCOM Okay Dave, and the rest of the readings please.

SCOTT Oh, okay. Okay 00 on the amps of course, the battery temps 112 and 119, and motor temps are still off scale low.

CAPCOM Okay Dave. Set up your circuit breaker configuration and open the batt covers please.

SCOTT Alrighty. It worked. Everything is going to be open except buss A and buss C in the OX assembly. The OX is now closed. BussB is open, Buss D is open. Open the others. Amp hours open. Okay Joe, all circuit breakers are now open with the exception of OX buss A and buss C.

CAPCOM Roger Dave and power external, TV remote.

SCOTT Okay, stand by. Let me, I'm in the middle of getting your covers here, just a second.

CAPCOM Okay, and comment on the dust on the battery mirrors. Do not brush them though.

SCOTT Oh, okay. Well there's a little dust on the central mirror, but the other two seem to be fairly clean. I just happen to have a camera which I'll take a picture for you.

CAPCOM Okay.

SCOTT So you'll know what everything looks like.

CAPCOM Why not.

SCOTT Okay I'm going to power, there's so much dust on here. The down positions is remote, right Joe. I mean external ox.

CAPCOM That's affirm.

IRWIN Here's that dust brush to dust it off.

SCOTT It's in a shadow and I can't see.

IRWIN Oh.

CAPCOM No problem Dave. The down position. And Dave. We'd like for you to aline the high gain per the check list proceedures but we're standing by for your readings on how possible you think that is because of the dim intensity of the earth.

CAPCOM Dave, do you read, Houston.

CAPCOM Hadley Base do you read Houston.

CAPCOM Hadley Base do you read Houston.

SCOTT Yea, I'm five by, Joe.

CAPCOM Okay. And I guess we're standing by for your high gain alinement per the check list.

SCOTT Okay, stand by.

CAPCOM Jim how are you doing.

IRWIN Oh fine Joe. Transfer to 2 bags up to the porch.

CAPCOM Sounds good.

IRWIN We have about 3 more to transfer up.

CAPCOM Super. And Dave, you might want to check TV remote.

SCOTT Okay Joe. Thanks.

CAPCOM Dave, give me a call on your present activity.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 167:43 CDT 08:18 497/1

CAPCOM Dave, give me a call on your present activity.
SCOTT Oh, just cleaning up the back of the Rover
here, Old Joe.
CAPCOM Okay.
CAPCOM And Dave, We do not have our TV yet. You might
want to check TV remote.
SCOTT Okay, Joe.
SCOTT It's sure hard to see the Earth.
IRWIN Circ on. You were in TV remote.
CAPCOM Okay, you might --
SCOTT We're back again.
CAPCOM You might want to verify the OX circuit breaker in.
SCOTT that's verified, Joe. The OX circuit breaker
is in.
CAPCOM Thank you.
SCOTT But you probably aren't getting --
SCOTT But you're probably are getting -- We haven't found
the Earth yet.
SCOTT Looking at into the Sun, it just tough and
then trying to aline this thing.
IRWIN You want me to go out there and see if
I can assist in any way, Dave?
SCOTT No. I'm going to try it from the other side, now.
CAPCOM Dave, maybe the best idea is just to use the
HEC technique.
SCOTT Yeah, I will.
CAPCOM That's plenty good enough.
SCOTT Okay.
SCOTT Hang right there, Jim for a minute.
IRWIN Okay.
IRWIN And you can use that background sound too.
SCOTT Yeah.
IRWIN When you're about done.
SCOTT Oh, Earth where are you?
SCOTT Tug at my viser.
SCOTT Yeah, I think that might be one.
SCOTT How are we doing, Joe?
IRWIN Why don't I come out and watch the EGC meter.
SCOTT No, I got it.
IRWIN Good.
SCOTT Okay, Joe, you should be alined.
CAPCOM Okay, Dave, thank you.
SCOTT I'll wait till you give me a go because --
Make sure you've got what you need.
CAPCOM Dave, cycle the switch internal and external
once for us, please.
SCOTT All right.
SCOTT Internal. External.

CAPCOM And we got it.
SCOTT Good show.
CAPCOM Thank you D.R.
SCOTT And Joe, let me ver --
SCOTT And Joe, let me verify that the position
of the Earth in the grid is the important thing and not the
angle at which the grid intersects the local vertical,
is that correct?
CAPCOM Dave, that's more or less correct. I think
we're satisfied with the alinement here. We guess that I
need some help on tilting our camera up to the level.
SCOTT Okay, just a second.
CAPCOM Dave, we need some help upping our camera up,
please.
SCOTT Okay, Joe.
SCOTT We're camera.
CAPCOM Okay, thank you. And I guess our only other
request is to take the dust brush with you back to the LM.
CAPCOM However, we may have also --
SCOTT (garble) one last pan here.
CAPCOM Rog, and we may have overshoot on the camera.
We might -- might have to have some help getting it towards
the horizontal.
SCOTT Okay.
SCOTT One last comment on the mountain that's south
of Hadley. I can see some large outcrops on the upper slopes --
on the upper 10 percent. And they really stand out and there's
a tailless downflow. As a matter of fact, it almost looks like
we have some laboring on the upper slopes number 10 percent,
apparently --
CAPCOM Okay Dave, we copy that. We need the camera
fixed.
SCOTT Yes sir. Going right there.
CAPCOM Roger and we're interested in --
SCOTT (garble) 05 degrees.
CAPCOM Rog, we're interested in moving on back
towards the LM. Carry the dust brush with you.
SCOTT Okay. How's the camera? Is it okay?
SCOTT Back to LM.
CAPCOM Okay.
SCOTT Is the camara all right now?
SCOTT That last time you called the tilt-up was
only up about 10 degree.
CAPCOM Roge, Dave. I think Ed must have lost control.
SCOTT Well, Ed's been doing pretty good.
CAPCOM You're right. He has.
CAPCOM He surely does.
CAPCOM Dave and Jim, we're ready for you to move the
baggage up into the Falcon and climb in.
SCOTT Okay.

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 167:43 CDT 08:18 497/3

CAPCOM As the space poet Rhyling would say we're ready for you to come again to the homes of men on the cool green hills of Earth.

SCOTT Thank you, Joe. We're ready too but it's been great.

SCOTT Fabulous place up here.

IRWIN Dave, I'm going to start getting in.

SCOTT Good.

CAPCOM Roger.

SCOTT Let me brush off maybe a little, partner.

IRWIN I'm almost through.

SCOTT Good time?

IRWIN Yeah. What Dave?

SCOTT Brush off.

IRWIN (garble).

SCOTT (garble). really the right stuff.

SCOTT Get if off you.

IRWIN (garble) Okay if you're ready you can dust me off.

END OF TAPE

CAPCOM Jim while you are dusting there how many suit-cases have you carried up?

IRWIN I only have two up there. There are two more down here plus ETB. Four stem up there on the porch.

CAPCOM Okay, good. And that core stem will go inside and lie on the floor against the midstep.

SCOTT Okay, we understand.

IRWIN Man I'm glad we got that core. (garble) core. I'll tell you. Okay, Dave, picture, I think we're going to get you.

SCOTT Okay.

IRWIN Take that along - oh, here's another mag, stick this in your pocket. That's a broken one. I'll put it in for you.

IRWIN GARBLE.

SCOTT Yeah.

SCOTT Take two over here. I use the LEC. I think oh I think I'll be okay Jim.

IRWIN Okay, I'm getting in, Dave.

SCOTT - I think with a little practice, Jim, I could jump all the way to the porch.

IRWIN Okay, I'm in.

SCOTT Okay. GARBLE.

IRWIN Come up if you hand me that tool it will help.

SCOTT Oh, yeah, I will. This ETB let me get you the tool.

IRWIN Okay, I have it. Go back now and get the others.

IRWIN Tell me when you are right there, pardner.

CAPCOM How are you doing Dave?

SCOTT Getting the last one right now, Joe.

CAPCOM Oh, boy.

SCOTT Okay.

IRWIN Dave just a reminder on the stems there.

IRWIN Yeah, let me get to this bag. There.

IRWIN Get it?

SCOTT Yeah these are good little holders here. Last thing will be the stems.

IRWIN Get them?

SCOTT Yeah I got them.

IRWIN Hey, watch it, the caps are on not very tight so be careful.

IRWIN Lie it on the floor here.

SCOTT Why don't you put it back in the -

IRWIN I'm afraid it'll get bumped there Dave.

SCOTT Yeah, I guess we'll just have to be careful and not step on the thing.

IRWIN Okay.

SCOTT Okay coming in.

APOLLO 15 MISSION COMMENTARY, 8/2/71 GET16753 CDT0828 498/2

IRWIN Okay, let me - hold on Dave, let me oh yeah
move out of the way.
SCOTT LEC out too. Okay.
IRWIN And I'll get behind my GARBLE.
SCOTT Okay.
IRWIN Okay the LEC is over the side.
CAPCOM Jim, this is Houston.
IRWIN Okay, I moved. Go ahead Joe.
CAPCOM Roger, Jim, we're hoping you got 4 sample - 4
collection bags and EGB in the cabin with you now.
IRWIN Well, we do. We've even got the core stems.
IRWIN Hold it there Dave, I'll get your antenna.
SCOTT Okay.
CAPCOM Dave and Jim I've noticed a very slight smile
on the face of the professor i think you very well may have
passed your final exam.
SCOTT Okay.
IRWIN Okay it's down, Dave.
SCOTT Okay coming through.
IRWIN A little more to your left. Straight ahead.
IRWIN More to your left, okay.
SCOTT Okay.
IRWIN You're hung up a little on me - if you can
shift to your right.
SCOTT Okay. Let me get that cover. Okay. Say why
don't we close the door.
IRWIN Yeah.
IRWIN My water's closed.
SCOTT Okay. Now, let me get yours.
IRWIN Struggle - maybe I'll struggle too.
SCOTT I got it.
IRWIN Now I'll let you get mine then?
SCOTT Yeah.
IRWIN Now start - you can turn around.
SCOTT Okay, back into your corner. Let me get back
into my corner. There now I think you can turn around

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET16803 CDT0838 499/1

IRWIN (garble)
SCOTT (garble)
IRWIN I don't, you.
SCOTT Thinking maybe I could shut your pliss valve. There I shifted you pliss, now you try it. Hold your shoulders back. Yea.
IRWIN That ones on. Yea, I can't get down that low. Get down that low. Go ahead and repress maybe it'll open.
SCOTT Let me try. Cooling. I'll put some water right there. Okay, I've got you. Okay, now.
CAPCOM Troops, we need your water off.
IRWIN (garble)
IRWIN Okay. (garble) Yea Joe, it's off.
SCOTT Get back in your corner if you can. You going to have it turn right so you can get the dump valve.
IRWIN I've already got it in auto.
SCOTT Really.
IRWIN Yea.
SCOTT Okay. just move back so I get the door.
IRWIN Dump water. I'm back in my little corner.
SCOTT Good.
IRWIN Yea.
SCOTT That a boy.
IRWIN Okay.
IRWIN Close the mock Dave.
SCOTT Okay. Okay dump valves both auto.
IRWIN Yea.
SCOTT Okay, cabin repress auto.
IRWIN Stand by.
CAPCOM Jim, we're having trouble verifying your water off.
IRWIN We'll check it here on the repress.
CAPCOM Jim, we'd like for you to check it now, and we're going dump water in the cabin if you miss it.
SCOTT Okay, you get in your corner and I'll get you from the rear. Turn around and get in your corner. Go back to your little corner. Oh. If I could just feel something.
IRWIN You must have got it Dave. I just got a (garble)
SCOTT Did you.
IRWIN Okay Joe, now can you confirm it.
CAPCOM Looks good.
IRWIN Yea, I got an A flag. Got it.

APOLLO 15 MISSION COMMENTARY 8/2/71 GET16803 CDT0838 499/2

SCOTT Well it was off.
SCOTT Okay. Give me 16 ECS cabin repress
closed.
IRWIN Closed.
SCOTT Okay, up she comes.
SCOTT There's one. 1.5, 2, 2.5,
3.5, 4, okay press A and B to cabin.
IRWIN Okay (garble)
CAPCOM Dave and Jim this is Houston.
IRWIN A and B are cabin.
SCOTT Okay. PLSS 02 going off.
IRWIN Joe's trying to call us.
SCOTT Yea, I know it.
CAPCOM Troops.
SCOTT Go ahead Houston.
CAPCOM Rog, Dave and Jim. Ed's coming on
the line down here just wanted to say I enjoyed it.
SCOTT Oh, well thank you Joe. You did a
super fine job. Appreciate you keeping such good track of
us.
CAPCOM Wouldn't have missed it for anything.
IRWIN Thank you Joe.
SCOTT Hey.
GRIFFIN Hadley Base, this is flight crew. The
whole mission control team wants to take their hats off to you
for a fine job. I was a lot of fun.
SCOTT Well thank you Gerry. We'd like to
take our hats off to the whole team. By golly you guys are
really sharp down there and we sure appreciate it. Cause
you know as well as we do, we sure couldn't do it without
you.
SCOTT Okay, let's see. Cabin warning lights
off. Cabin pressure's stable at about 45. The purge valve to
depress, we're depressed. I am aren't you.
IRWIN Yea.
SCOTT Verify EVA circuit breaker configuration.
If you can move forward I can get in there to verify it a line.
IRWIN Stand by.
SCOTT Are you trying to get your 02 off.
IRWIN Yea. Okay, it's off.
SCOTT Good. Okay.
IRWIN Okay, my circuit breakers are okay
except fan 2 for fan DELTA-T which we'll pick up.
SCOTT Yea. Check mine here.
SCOTT Okay, mine are okay. Let's see.
TB 16 ECS suit van 2 closed.
IRWIN Okay closed.
SCOTT Suit van DELTA-T closed.
IRWIN Closed.

SCOTT Okay dock the gloves and stow in the
comm panel.
IRWIN Wait, I didn't depress.
SCOTT Why don't you use the purge valve.
IRWIN Oh you didn't. Yea. Okay.
SCOTT Can you get it okay.
IRWIN Yea. Stand by. I can't Dave, I'll
turn around.
SCOTT Okay. Let me get out of your way.
IRWIN Okay, it's coming down but very slowly.
SCOTT Okay come on around.
SCOTT Okay, put you in high flow here.
IRWIN There you go.
SCOTT Okay, let's take off you gloves.
When you get down.
IRWIN I'll verify the safety here.
SCOTT Auto, safetoes pm tje di,! va;ve/
Next thing is remove purge valves anyway. Descent water
valve open when you get to it Jim.
IRWIN Okay, just a moment. Back up a little bit.
Okay, descent waters is coming open.
SCOTT Okay.
IRWIN Okay pull the purge valve out, you
disconnect OPS 02 hose.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET16813 CDT0848 500/1

FALCON Okay, mine's up.
IRWIN Dave the next thing is connect the LM 02 hoses. At the red blue blue.
SCOTT Connect the red blue and blue.
IRWIN Yeah, we've got to do a dump.
SCOTT Yeah.
SCOTT Better make sure we got GARBLE OPS.
IRWIN PLSS.
SCOTT Okay.
IRWIN Garble. Looks like my GARBLE water is off.
SCOTT Say again.
IRWIN I feel like the (garble) water is off. I've got my hands now let me get back here. Take them off.
SCOTT You didn't water (garble)
IRWIN I know.
SCOTT It was off and you must have bumped it maybe.
IRWIN It was off and we're getting water alright. I feel it running down my legs.
SCOTT I can't understand that it was on.
IRWIN It wasn't off then - but I never turned it off and it went off.
IRWIN It's probably catching up on something Dave just like it did yesterday.
SCOTT Yeah, I turned it off.
IRWIN Okay, mu 02 hoses, connected at water circuit flow.
SCOTT Okay.
IRWIN PLSS pump off - man off -
SCOTT Fan off.
IRWIN My 02 hoses and I did a GARBLE inflow. And suit isolation suit probe PLSS pump off, GARBLE pump off, GARBLE off.
SCOTT Fan off.
IRWIN Okay disconnect the PLSS water to PGA and connect LM water to the PGA.
SCOTT Okay, water is connected.
IRWIN How about a little LCG pump action.
SCOTT Yes sir. The COMM on?
IRWIN Not yet.
SCOTT Let's press on down here.
IRWIN Okay your flow ought to cool you there, it's cooling me pretty good.
SCOTT Yeah.
SCOTT Okay PLSS mode both to 0. Audio circuit breaker open and connect the LM COMM.
IRWIN Okay.
IRWIN Okay, you back on?
SCOTT Back on, Jim.
SCOTT Okay, that's better. Okay, audio panels for both of us VHF A to RECEIVE and B to GARBLE.

APOLLO 15 MISSION COMMENTARY, 8/2/71 GET16813 CDT0848 500/2

SCOTT E to OFF.
IRWIN No and I see SPTT in relay OFF.
SPEAKER garble.
CAPCOM Hadley base, Houston, do you read?
SCOTT Rog, Houston, Hadley base, go.
CAPCOM Okay, could we have the power amp, please.
SCOTT Power AMP coming on.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 168:23 CDT 08:58 501/1

PAO This is Apollo Control at 168 hours 24 minutes ground elapsed time. After a third EVA at 4 hours and 50 minutes and 9 seconds from depress to repress. They started depressurization of the Lunar Module at 163 1750 ground elapsed time. The crew loaded the equipment aboard the Lunar roving vehicle at 164 04 which time they began the trip out to the ALSEP area. And the -- abbreviated time line for the third extravehicular activity included recovering the core tube which had been driven yesterday and partially loosened and had to be recovered from the ALSEP area. Then, they drove over to station 9 on the edge of Hadley Rille and northward from there to station 10 and from both places, the crew collected samples more core samples as well as bags of rocks and finds and it was desired to get the crew back to the LM at about 167 hours which was followed fairly closely. They returned at -- to the LM actually at 166:47 ground elapsed time. At station 9 on the edge of the Rille, the -- Scott tripped on a rock that he was unable to see because of the restrictions of his helmet visor but he recovered with some assistance from Irwin. They collected a double core sample at this station. Made several stereo photographs. And upon returning to the Lunar Module, they were successful in partially separating the balky drill stem core. Dave Scott cancelled the new stamp which is being issued today. The stamp was on a blank envelope addressed to no one and will go to the Post Office Department. Scott also recreated or paraphrased, I should say, Mr. Galileo's experiment of several centuries ago by dropping a hammer and a feather to show that gravity was not dependent upon the weight of an object. They parked the Lunar roving vehicle about a 100 yards east of the Lunar Module on a slight rise to view the ascent into Lunar Orbit with the television camera which was also acting up somewhat today with slipping clutches. Finally returned to the Lunar Module and completed repressurization at the end of third EVA. AMP hours remaining on the two LRV batteries are 83 and 90 respectively. The Command Service Module made a plane change at 165:11 which changes the plane to coincide with the plane of the Lunar Module when it ascends into lunar orbit again. And the plans are now is to command the television camera back on to hopefully record at least the ignition and staging phases of Lunar Module ascent. Handover going on in the Control Center from the Gold Team to the Maroon Team, we have at this time no estimate of when the change of shift briefing will be in the Houston News Center. And at 168 hours 30 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/2/71, 9:08CDT, 168:33GET, 502/1

FALCON Houston, this is Hadley Base with a weight report for the day.

CAPCOM Okay, Hadley Base, we're ready to copy.

FALCON Okay, Ed, the B SLSS bag was 25, 25; bag number 7 was 24 and bag number 2 was 23 for a total of 72;

CAPCOM Okay, we copy. Do you have a bag 8 number?

FALCON We do, but we don't - we're not - we don't have any rocks in it.

FALCON Okay, Ed, no weight to that.

CAPCOM Roger, and Jim, the - -

FALCON But we don't want the contents of - -

CAPCOM The only thing we need to advise you before you go on here is to tape the caps on your long core stem, both ends of it, before you depress.

FALCON Okay, we understand.

FALCON And Ed, we shuffled - we took the contents out of bag 8 and consolidated it into bag 7.

CAPCOM Okay, bag 8 went into bag 7. Thank you.

And be advised: we're going to delete your P22 to give you a little more time; we're a little bit pressed on lift-off time, now.

FALCON Okay.

PAO This is Apollo Control at 168 hours 50 minutes. We estimate the change of shift news briefing to begin shortly after 9:30.

PAO This is Apollo Control at 168 hours 55 minutes. The news conference participants are enroute to the news center and the change of shift briefing will begin shortly.

CAPCOM Hadley Base, Houston, observe you're doing your pressure integrity check; we'd like your (garble) gage readout please.

FALCON Okay. 3.7 to 3.6 in a minute.

CAPCOM Very good, thank you.

FALCON Roger.

FALCON Okay, Houston. Hadley Base stand by for a go for depress.

CAPCOM Okay, Hadley Base, you're go for depress.

FALCON Okay, thank you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 169:59 CDT 10:33 503/1

PAO This is Apollo Control at 170 hours. We'll play back the tape of the air/ground conversation that occurred during the news conference.

SCOTT Houston, are you ready for the -- the battery reconfiguration?

CAPCOM Okay, let's have it.

SCOTT Okay.

FALCON This is Falcon. We observe the batteries coming on and I have lift off time when you're ready.

CAPCOM Stand by.

SCOTT 37 2236.

CAPCOM I think I heard that. Let me read it back.
171 37 2236. I have some star changes for the P57.

FALCON Okay, go ahead.

CAPCOM For the P57 coming right up now, let's use star 5 and decamp 3 and you should find it at a (garble) 182.2 and at the (garble) of 284.0.

FALCON Roger, I copied that.

CAPCOM And Falcon, when you get around to it, how about a E batt check, please.

FALCON Roger, Ed. 37 on both.

CAPCOM Thank you.

FALCON And Ed, an E Memory dump coming down.

CAPCOM Okay, we're ready. Let her come.

FALCON Hadley Base, Houston, we got your E mod, we're ready to give you an uplink.

CAPCOM All right.

CAPCOM All right (garble). you got it.

CAPCOM Falcon, Houston. Looks like we need to do a verb 96. You're doing (garble) through an integration loop.

FALCON Yeah, I thought that threw us. Data might get you in trouble.

FALCON Okay, how's that?

CAPCOM Okay, we'll try again.

CAPCOM Falcon, the computer is yours.

FALCON Rog, thank you.

CAPCOM Okay, you can torque.

FALCON Rog, torque at 38.

CAPCOM Falcon, Houston, how do you read?

FALCON Go ahead, Houston, five by.

END OF TAPE

CAPCOM Falcon, Houston. Can you read me?

FALCON Go ahead Houston. Five by.

CAPCOM Roger. How are you coming with you stowage. We have these locations available still if you're not too well stowed up yet.

FALCON Well we were just mushing along with the check list here and why don't you go through what you have in mind, I'm sorry. We're pressing on. We'll take a listen to what you've got here.

CAPCOM Okay. What we were expecting was bags 4 and 6 in the ISA, bag 3 in the aft engine, behind the aft engine, and 2 and 7 in the right and left hand stowage compartment with 7 in the left hand 2 in the right hand.

FALCON Ed, let me tell you where we, where we have them.

CAPCOM Okay.

FALCON We have the aft engine cover is bag 3, the left hand mid section is bag 2, the right hand side is bag 7, and the one remaining bag we figured we'd put in the ISA.

CAPCOM Okay Jim. We seem to have bag, that would either be bag 4 or 6, and we seem to have both of them indicated for the ISA.

FALCON Okay, we'll put it, other words you would like bags 4 and 6 in the ISA. That would work out fine.

CAPCOM That's great, and it sounds like the rest of it's as per planned. And be advised we're showing total weight of slightly in excess of 230 pounds, which is a little over what we expected. However by deleting a plane change we're going to have plenty of fuel for it.

FALCON Roger thank you.

PAO This is Apollo Control at 170 hours 07 minutes. We're back live on air ground now.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/2/71, 10:44CDT, 170:10GET, 505/1

PAO This is Apollo Control at 170 hours 17 minutes. The updated coordinates for the LM impact point are 26 degrees 24 minutes north, 1 degree 6 minutes east.

PAO This is Apollo Control at 170 hours 20 minutes. We've had loss of signal on Endeavour in it 47th lunar revolution. All systems look solid as it went behind the moon.

CAPCOM Falcon, Houston.

FALCON Go ahead, Ed.

CAPCOM Give us a little bit of an idea where you are Jim. We're starting to worry about time a little bit.

FALCON Well, we're just configuring circuit breakers right now.

CAPCOM Okay. One thing we do need is you to weigh your ISA and we need the weight on it please.

FALCON It's all weighed and stowed.

CAPCOM Okay, have you got a weight that we can have?

FALCON Stand by one.

CAPCOM Well, if it's too much trouble, ignore it, Jim, but if you have it real handy I'll take it.

FALCON We'll give you a weight here shortly.

CAPCOM Okay, thank you.

FALCON Okay, Houston. Falcon.

CAPCOM Go ahead Falcon.

FALCON Okay. And the rendezvous radar shop test to the verb 63 I have no shaft variation on the noun 72. The trunnion's going about a half a cycle per second, but the shaft seems to be at 220, although the cross pointers are moving.

CAPCOM Okay, we copy that. Stand by one.

CAPCOM Dave, If there's any chance you can see the shadow, the antenna is moving is it not?

FALCON Yes, and it looks like it's moving the shaft; I can't really tell, but I - the shadow's moving and the cross pointers are moving.

CAPCOM Okay, thank you.

FALCON Okay, Houston, the designate seems to work okay. You uh - -

CAPCOM That's affirmed Dave. We just think you might have driven it into a stop.

CAPCOM And Falcon, Houston, I observed you're starting your AGS load; I'd like to give you the pad before you do that.

FALCON Okay. I was wondering when you were going to send it up, Ed.

CAPCOM Been waiting for your call, Jim. Okay, I've got a direct pad, a coeliptic pad, and a CSI pad for you.

FALCON Okay, ready for the ascent pad.

CAPCOM Okay, here comes the direct: 171 37 2236
55304 00320 minus 0004 plus 37742 plus 01722 plus 58516 plus
56943 plus 00320 plus 01496; TPI is 172 29 3900; the LM weight
10936; TIG one rev late 173 35 34; coeliptic ascent pad:
171 40 1341 55320 00200 minus 0005 plus 37742 01722

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 170:42 CDT 11:17 506/1

CAPCOM 00 minus 0005 plus 37742 plus 01722 plus 58550 plus 56943 plus 00200. The rest NA. Read back.

FALCON Okay, for direct. Read back 171 37 2236 55304 00320 minus 0004 plus 37742 plus 01722 plus 58516 plus 56943 plus 00320 plus 01496 172 24 03900 10936. Tape for one rev late 173 3534. CSI -- coelliptic rather. 171 40 1341 55320 00200 minus 0005 plus 37742 plus 01722 plus 58550 plus 56943 plus 00200.

CAPCOM Okay, Jim. One error on the direct NOUN 37 TPI time. It should be 17229 3900.

FALCON Okay, 17229 3900.

CAPCOM That's affirmed. Now the CSI pad.

CAPCOM 172 35 0800 174 27 all zeros. 0490 plus all zeros. 01551 02670 plus 0490 plus all zeros plus 0010.

FALCON Okay, see if I (garble). 172 35 0800 174 27 all zips plus 0490 all zips, 01551 02670 plus 0490 plus all zips plus 0010.

CAPCOM That's a good readback, Jim. Be advised - we had a little COMM problems with the Command Module before it went over the hill. We're going to be a little busy with him at AOS giving him some numbers and an uplink. And we were wondering down here. Did you get any food after you got back in and the medics would also like your PRD readings from page 12-4.

FALCON Stand by on that.

CAPCOM Falcon, Houston. If you are having to dig the PRD's out, skip it for now, please.

FALCON Okay, we will.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET17047 CDT1122 507/1

FALCON Okay Houston, the RCS hot fire looks okay.

CAPCOM Okay Falcon. And Falcon Houston. For your P57, we'd like to use star 5 again and you should find it in detent 3, and a curser of 184 and a spiral of 282.

FALCON Okay, we already have those Ed.

CAPCOM Okay, I think I inverted them. Spiral with 282 and a curser 184.

FALCON That's okay, we'll find it. It's a good star.

FALCON And Ed, I'm ready to call out the mags K factor whenever you have it.

CAPCOM I'm trying to get it for you now, Jim. You beat me by about 15 or 20 seconds. Falcon Houston, your AGS K factor 170 00 00.80.

FALCON Roger, copy 170 00 00 80.

CAPCOM That's affirm.

CAPCOM Copied your angles.

FALCON Okay, thank you.

CAPCOM And be advised I have some new rendezvous radar angles for you Dave. I'll explain them when we get time.

FALCON Okay Ed, go with the radar angles.

CAPCOM Roger, 186 and 277. And the reason for this Dave is that the command module is a little bit more in an elliptic orbit than we're used to and I'll have some more words about the TPI burn after while after we look at it a little more.

FALCON Okay fine.

CAPCOM Rog, his orbit's 64 by 54 about 10 miles difference in perilune and apolune.

FALCON Alright.

CAPCOM 2 0 zero's. We copy 4705.

FALCON (garble) batts on.

FALCON Roger. SN batts going on right now Ed.

CAPCOM And we copy. And Falcon, we will not up link you at lift off minus 35. You can press on with your check list.

FALCON Okay, thank you.

CAPCOM Endeavour Houston standing by.

ENDEAVOUR Hello Houston, Endeavour.

CAPCOM Okay Al, loud and clear.

FLACON Hey Ed, I'm in react noun now.

CAPCOM Roger, and Falcon your 047053 are okay. Al, did you get the TPI and lift off time for the direct ascent before LOS over.

ENDEAVOUR Affirmative.

CAPCOM Okay, let us have P00 and ACCEPT and we'll give you an up link.

APOLLO 15 MISSION COMMENTARY 8/2/71 GET17047 CDT1122 507/2

ENDEAVOUR You have it.

CAPCOM Okay, let me give you the coelliptic pad,

Al.

ENDEAVOUR Go ahead.

CAPCOM Okay, at lift off is 171 40 1341,
and GET of CSI 172 35 0800 and noun 37 your take TPI is 174
27 all zero's. Read back.

ENDEAVOUR Okay, understand on a direct ascent
it's lift off 171 37 2236 TPI 172 29 39 00 GSM weight 35995
coelliptic lift off 171 40 1341, CSI 172 35 0800 TPI 174
27 00 00.

CAPCOM Okay Al, that's a good read back.

And Al, let me advise you that because of your orbit, the
TPI is going to be non-nominal in angle about the same Delta V
however, different angle, we'll have more words after insertion.

ENDEAVOUR Okay, do you want the gyro torquing angle
on the last P52?

CAPCOM That's affirm, I'm ready to copy.

ENDEAVOUR Okay, minus 4 balls 6, minus 00017,
and minus 000 -

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 171:06 CDT 11:40 508/1

FALCON Okay. If you want the gyro torquing angles on the last P52.

CAPCOM That's affirmed. I'm ready to copy.

FALCON Okay. Minus 4 balls 6 minus 0017 and minus 00017 and they were torqued out 17006.

CAPCOM Copy. Minus 4 balls 6 minus 3 balls on 7 minus 3 balls 17 torqued at 17006.

FALCON Roger.

CAPCOM And give us auto on the high-gain and Al, we're not going to bother with your P27 pad readup unless you especially want it.

ENDEAVOUR Negative, Ed.

PAO This is Apollo Control at 171 hours 7 minutes. We have the Command Module Endeavour back on the air/ground circuit now with the Falcon so you will hear both spacecrafts on the -- the same air/ground circuit.

FALCON (garble) on the relay. How do we sound?

CAPCOM Hello Falcon, Endeavour here. You're loud and clear.

FALCON Okay, we're all set. Ready to give us some warm chow?

CAPCOM Yes, sir.

FALCON Great. I'll tell you a cold tomato soup isn't too good.

CAPCOM Endeavour, the computer is yours.

ENDEAVOUR Roger, Houston.

CAPCOM Endeavour, Houston.

ENDEAVOUR Go ahead, Houston.

CAPCOM Al, were you having any COMM difficulties before LOS on our last pass. We've lost you for about 20 to 25 minutes.

ENDEAVOUR Sure didn't notice any, Ed. I was busy down in the LEB but I didn't get any signal in the headset indicating that we've lost S-Band lock and I had to squelch off.

CAPCOM Okey, doke.

PAO This is Apollo Control at 171 hours 10 minutes. We're 26 minutes 55 seconds away from ignition on lunar lift off. We have passed up to both the Endeavour and the Falcon, the information for a direct ascent which we do plan to do and also information for a coelliptic rendezvous as a backup to the direct ascent.

CAPCOM Endeavour, Houston. Omni DELTA.

ENDEAVOUR Omni DELTA.

CAPCOM And Falcon Houston. I have some PIPA BIASES when you'll like them.

ENDEAVOUR Stand by, Houston.

PAO This is Apollo Control. Because of the clutch problems in the camera controls on the lunar surface, we will not attempt to track Falcon after lift off. We'll

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 171:06 CDT 11:40 508/2

PAO get a picture of the lift off but we will not attempt to track it.

CAPCOM Falcon, Houston. Verify slew. We're about to hand over.

FALCON We're going SLEW.

CAPCOM Falcon, Houston. Handover complete. Verify auto, please.

FALCON Roger, going back to auto.

CAPCOM And Falcon, Houston. I still have some PIPA BIASES I need to give you.

CAPCOM Okay, Falcon, Houston. Observe your in VERB 83 lift off minus 12. We're right on schedule. I have a couple of updates for you, please.

CAPCOM Falcon, Houston. Do you read?

CAPCOM Falcon, Houston. In the blind, while we're looking at our COMM problem, your PIPA BIAS -

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/2/71, 12:01CDT, 171:26GET, 509/1

CAPCOM while we're looking at our comm problem.
Your PIPA bias verb 21 noun 01 ENTER; enter it - put that in
if you read me.

FALCON Houston, Falcon.

CAPCOM Okay, Falcon, there we have you; had
a little net problem. I have a PIPA bias update for you.

FALCON Well, stand by. You ready to watch the
APS pressurize?

CAPCOM Okay, let's let her go.

FALCON Okay, here comes tank 1. And we'll stand
by for your call for tank 2.

CAPCOM Roger.

CAPCOM Okay. Go with tank 2; looks good.

FALCON Okay. Tank 2 coming now.

CAPCOM Looks good down here.

FALCON Okay, thank you; looks good up here.

CAPCOM And Dave, you're go for the direct rendezvous;
both guidance systems look good; PGNS is your recommendation.

FALCON Roger. Go for direct on the PGNS.

CAPCOM Falcon, are you still with us?

FALCON Roger.

CAPCOM Okay. Have a couple of numbers I need to
read for you Dave, when you're ready.

FALCON Okay; pencil's out; go ahead.

CAPCOM Okay. PIPA bias is Y PIPA the verb 21 noun 01
a 1454 ENTER; and the data is 04366 ENTER; X PIPA verb 21 noun 01
address 1452 ENTER data 04672 ENTER.

FALCON Okay. Here's the readback on that Ed. Verb 21
noun 01 1454 ENTER, 04366 and in verb 21 noun 01 1452 ENTER
04672.

CAPCOM That's a good readback and when you have
your timeline book out I'd like to change some range and range-
rate numbers because of this ellipticity command module orbit.

FALCON Okay Ed. Do you want those PIPA biases loaded
now?

CAPCOM That's affirm.

FALCON Alright.

FALCON Okay, Ed. What are the changes in the time-
line book?

CAPCOM Okay, the range and range-rate at insertion:
range rate is 137 range minus - sorry range is 137;
range rate minus 431 at plus 5 minutes range 117 range rate
minus 398 and at 10 minutes range is 98 range rate minus 355.

FALCON Okay, I copied that data.

CAPCOM Good enough.

ENDEAVOUR Falcon, Endeavour. On(garble) VHF how do you
read?

ENDEAVOUR Okay Falcon, Endeavour. How do you read
us now? 5 by?

FALCON Loud and clear.

CAPCOM And Falcon, Houston we'd like you to change

APOLLO 15 MISSION COMMENTARY, 8/2/71, 12:01CDT, 171:26GET, 509/2

CAPCOM your 053 number to plus 01722.
FALCON Copy. The 053 to plus 01722.
CAPCOM That's affirm.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET17132 CDT1207 510/1

CAPCOM Falcon, Houston. Can you make your VHF check so we can hand over to the network please.

FALCON Rog. We tried and I got no response and I'll stand by. We should be hot miked to the Endeavour.

FALCON Okay, Houston. We've got trouble on the VHF check as he approaches the mountains back there. We usually don't get him until he's almost over head, because of the -

ENDEAVOUR Okay Falcon, there you are. I've got you now.

FALCON Okay.

CAPCOM Understand VHF check is good now.

ENDEAVOUR (garble) Dave.

FALCON Rog, VHF check is go Ed, Falcon.

CAPCOM Endeavour, Houston. We're going to hand you over now.

ENDEAVOUR Endeavour Roger.

FALCON Falcon, hey Houston, Falcon. How do you read on vox.

CAPCOM Okay loud and clear Dave and your go for lift off, and I assume you've taken your explorer hats off and put on your pilot hats.

FALCON Yes sir, we sure have. Ready to do some flying. Stand by for 1 minute. Okay, steering is in. Okay.

CAPCOM Mark 1 minute.

FALCON Master arm is on I have 2 lights. MHG is on. 4th stage engine on to (garble) 99 probe. Good lift off automatic. Stable at about 306. Hey good smooth ride Ed.

CAPCOM Roger copy now.

PAO Looking good altitude 24 00 feet.

FALCON All looks good at 30.

CAPCOM Falcon you're go at 1 minute before auto start. Normal shut down.

FALCON Roger auto start and normal shut down.

FALCON Both guidance systems are good Dave.

FALCON Okay, looks good up here.

FALCON It almost sounds like the wind whisling doesn't it.

FALCON What a view of the rille. Rover tracks (garble)

PAO That music is from the CSM down link.

FALCON (garble)

PAO Network corrects that to say it's from the LM down link.

FALCON Pretty.

FALCON Right on profile.

CAPCOM Falcon, Houston you're looking good at 3 minutes.

APOLLO 15 MISSION COMMENTARY 8/2/71 GET17132 CDT1207 510/2

FALCON The only thing unusual I noticed is
the RGS oxidizer manifold pressure oscillates ever time the
jets fire. That's backing up to the (garble) copy. (garble)

PAO Altitude 30 thousand feet. Velocity
2 129 feet per second.

CAPCOM Falcon, Houston. You're go at 4.

PAO 42 thousand feet now.

FALCON Radar lockup.

FALCON 5 minutes.

FALCON Sounds good.

CAPCOM Falcon, Houston. You're still looking
good. Your PGNS are showing a slight radio error but it's
a little bit more than nominal, but everything's go.

FALCON Rog, understand.

FALCON (garble) radar.

FALCON (garble)

FALCON Yea.

FALCON A thousand to go. (garble) 500.

FALCON Okay.

END OF TAPE

FALCON (garble) 1000 to go. SMC 500.
 FALCON Okay.
 CAPCOM Falcon, Houston. Trim AGS.
 FALCON Roger, understand. Trim the AGS.
 CAPCOM Falcon, Houston. Trim in plane only.
 FALCON Roger, in plane only on the AGS.
 CAPCOM (garble)
 FALCON The ARM is off?
 FALCON We'll shut down on the PGNCS.
 FALCON Okay, auto shut down.
 FALCON AGS 500?
 FALCON 502.
 FALCON Master alarm AGS, master alarm.
 CAPCOM Copy.
 FALCON Hey, we got a master alarm on the AGS, but we trimmed the AGS. Stand by for a tweak or a trim.
 CAPCOM Okay.
 FALCON (garble) okay.
 FALCON PGNCS says it's in a 40.6 by 8.9.
 CAPCOM Roger, copy. Guidance still looks good to us.
 FALCON Okay.
 CAPCOM Falcon your AGS still looks good.
 FALCON Ed, we copy.
 FALCON Okay, understand. AGS still looks good.
 CAPCOM Falcon, Houston. No tweak.
 FALCON Roger, no tweak. Thank you.
 ENDEAVOUR Okay, Falcon, Endeavour. I got you locked up on the VHF at 127.
 FALCON Okay, I understand. 127, Al.
 CAPCOM Do you read?
 FALCON Roger, go ahead.
 CAPCOM Okay, we're picking up the radar track unit too. We didn't get a lock on it on the way up. We'll give you a call as soon as we get locked up.
 FALCON Okay. I was watching for that and I'll let you know.
 FALCON And Houston. We're watching the roll angle.
 CAPCOM Falcon, Houston. We have you on a 42 by 9. You're looking good.
 FALCON Okay. 42 by 9.
 FALCON (garble) Jim.
 FALCON (garble)
 ENDEAVOUR Dave, you're locked on now.
 FALCON Rog, we're locking up now.
 ENDEAVOUR Rog, got good signals (garble).
 FALCON Rog.
 ENDEAVOUR VHF range has us at 117 now. 117.
 CAPCOM Endeavour, Houston. We're ready to uplink you.

APOLLO 15 MISSION COMMENTARY 8/2/71 17141 GET 1216 CDT 511/2

ENDEAVOUR Go ahead, you've got POO and ACCEPT.
ENDEAVOUR What kind of range is radar giving you, Dave?
CAPCOM Falcon, Houston, we will not uplink a state
vector to you, your PGNCS and AGS are both good; we will keep
them independent.
FALCON Falcon rog.
CAPCOM Endeavour, Houston, the computer's yours.
ENDEAVOUR Rog.
CAPCOM Okay, Falcon, Houston, I have a MSFN TPI for
you and some words.
FALCON Go ahead, I'm ready to copy the TPI.
CAPCOM Okay, it's an off nominal TPI angle. (Garbled).
DELTA-V Z minus 31.2; total 73.7; TPF DELTA-V will be 26.0.
Your're going to be pointed almost along the line of sight
for TPI. You could omit the roll maneuver for TPI, your
choice, and you will undoubtedly break lock.
FALCON Okay, I'm up, and I have plus 66.3 plus 7.8
minus 31.2; total for 73.7 and 26.0 for TPF.
CAPCOM That's affirm, and the approach at TPF is
going to be right along the local horizontal.
FALCON Okay, thanks for the information, Houston.
I think if radar's working good and we get a good solution
we will probably stay heads up and go ahead and accept the
breaklock.
CAPCOM Roger, roger. And Endeavour, Houston. The
same goes for you; your attitude, if you were to have to make
the burn would be along the line of sight as well.
ENDEAVOUR Endeavour roger.
FALCON And Houston, Falcon, I have a visual on the
Endeavour now; the COAS is exactly foresighted, the radar needles
are boresighted --

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/2/71, 12:28CDT, 171:53GET, 512/...

CAPCOM Endeavour, Houston. The same goes for you. Your attitude, if you would have to make the burn would be along the line of that as well.

ENDEAVOUR Endeavour, Roger.

FALCON And Houston, Falcon. I have a visual on the Endeavour now and the COAS is exactly boresighted; the radar needles are boresighted and the PNGS needles are boresighted and the AGS needles are boresighted, so we're looking pretty good.

CAPCOM Very good, Dave.

CAPCOM And, Falcon, Houston, as far as we can tell, your AGS is completely go; we see no reason for the master alarm yet.

FALCON Understand.

FALCON Okay, Endeavour; Falcon, I'm looking at about 94 miles 355 feet per second.

ENDEAVOUR Oh Rog. I'm looking at 94 miles also.

FALCON Okay, good show.

FALCON And the PNGS state vector agrees with that.

CAPCOM And Falcon, Houston. You're go for an APS PTI. You have 180 feet available.

FALCON Oh Rog. Understand. Go for the APS TPI.

PAO TPI will be performed behind the moon.

LOS on the LM in 19 minutes 12 seconds; on the command module 20 minutes 01 second.

ENDEAVOUR Falcon, Endeavour. You got your lights on Jim?

ENDEAVOUR Okay.

CAPCOM Falcon, Houston.

FALCON Houston, Falcon. Go.

CAPCOM Be advised your direct rendezvous TPI charts are no go because of this elliptical rendezvous; your midcourse charts are good.

FALCON Okay. Understand. The TPI charts are no go and the midcourse charts are good.

FALCON Roger. I'm turning the lights on.

FALCON I don't see your tracking lights.

PAO Range about 70 miles now.

ENDEAVOUR Falcon, Endeavour. I don't have your lights.

FALCON Okay.

FALCON Houston, Falcon. What's your LOS time?

CAPCOM Falcon, Houston. LOS in 12 minutes.

FALCON Roger; 12 minutes. Okay.

ENDEAVOUR Okay, I got your lights now Dave.

FALCON Okay. Very good.

PAO Falcon is still on the primary guidance system. The crew trimmed the numbers in the secondary system at insertion.

ENDEAVOUR Falcon, Endeavour. I'm getting some large updates on you there Dave on the first MARK.

FALCON Okay.

PAO But both guidance systems are good. And

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PAO they're operating on PNGS.

ENDEAVOUR Yeah, that's right. VHF's going okay.
First optics is up, I by passed to them. I'll take them
there.

CAPCOM Falcon, Houston.

FALCON Houston, Falcon. Go.

CAPCOM You need to tweak up your pippers a little
bit more Dave, before TPI.

FALCON Okay, fine. Pencil's out go ahead.

CAPCOM WS 1452 05210. WS 1456 03170. And those
report VERB 21 NOUN 01.

FALCON Okay we copy. A VERB 21, NOUN 01, 1452
should be 05210, and 1456 should be 03170.

CAPCOM Good readback.

PAO This is Apollo Control. Biomedical moni-
toring was on Dave Scott during lift off. His heart rate at
lift off was 74.

END OF TAPE

ENDEAVOUR Okay Dave. The first up date was the only large one, the rest of them are all falling in.

FALCON Okay, very good. Hey Houston, Falcon, we're seeing a fairly large difference reads between the on board solutions and the ground solutions, but I guess that can be expected at the recycle.

CAPCOM I'm checking it for you now, Dave. Your PGNCS and AGS seem to be pretty well.

FALCON Rog, and I think we can expect a fairly large zee at the recycle.

CAPCOM I'll give that some words on the (garble) in a minute.

FALCON Rog.

CAPCOM Falcon, Houston. We're going to watch it for a few more minutes and see how they converge the other solution.

FALCON Roger.

ENDEAVOUR Okay Dave, I've got a recycle solution for you.

FALCON Rog.

ENDEAVOUR minus 69.4 minus 6.2 plus 12.0

CAPCOM Endeavour, Houston. I need omni alpha.

ENDEAVOUR Omni alpha.

CAPCOM Falcon, Houston.

FALCON Houston, Falcon, go.

CAPCOM Roger, FIDO thinks you had a good solution, but not a great solution before. He's now saying the z component will be, should converge to about a minus 19, and if it does, your approach angle will be more nominal rather than along the horizontal.

FALCON Okay, that sounds like we're all converging to the same spot. Thank you.

CAPCOM We agree, Dave.

FALCON Okay, Houston, Falcon our (garble) shown as pretty nominal. I guess we'll probably stay with the nominal procedures on the TPI.

CAPCOM Roger, Falcon, we have you a minute to LOS. Your solutions look good in both computers. We'll see you on the other side, and be advised we did monitor your lift off and we can confirm you lifted off.

FALCON Well very good. That's nice to know, thank you much. Save the tapes for us will you.

CAPCOM Say again please.

FALCON Save the TV tapes for us, will you please.

CAPCOM Will do, you're 30 seconds from LOS, Falcon.

FALCON Rog, see you around the corner.

CAPCOM Roger, roger Dave.

APOLLO 15 MISSION COMMENTARY 8/2/71 CST12:41 GET172:06 513/2

PAO We have had loss of signal from the lunar module about 40 seconds away from LOS on the command module.

CAPCOM And Endeavour, Houston. I have you 30 seconds from LOS.

ENDEAVOUR Endeavour, Ron see you on the other side.

CAPCOM Oky doke, Al.

PAO This is Apollo Control. We've had loss of signal on Endeavour now. Terminal phase initiation for their rendezvous will be performed behind the moon at 172 hours 29 minutes 39 seconds. We will reacquire both spacecraft just a few minutes before the TPF, the terminal phase breaking as they're rendezvousing. Had 2 firsts on this lift off. First we've seen it on television, also the first melodious lift off. The Air Force song coming from the lunar module and its Air Force crew, they perhaps would have to alter the lyrics a little to, off we go into the wild black wonder, from the lunar surface. We'll reacquire the command module at 173 hours 1 minute 40 seconds. The lunar module at 173 hours 3 minutes 29 seconds. At 172 hours 17 minutes, this is Mission Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GER17300 CDT1334 514/1

PAO This is Apollo Control at 173 hours. We're just under a minute away from acquisition of signal with both the command module and the lunar module. We'll be getting a TPI burn report from Falcon soon after acquisition. And Falcon will be starting the rendezvous breaking maneuver a few minutes after acquisition. We expect television to begin at about 173 hours 10 minutes as scheduled in the flight plan and see this rendezvous. We'll stand by live now for the first conservation.

PAO We have acquired both vehicles now, we'll stand by.

CAPCOM Falcon, Houston, standing by.

FALCON Rog, Houston. Falcon had a good TPI. It burned a small midcourse 1, and a small midcourse 2. Presently we have a visual on the command module and all the solutions have been agreeing very well.

CAPCOM Okay, did you write down your solution, Dave?

FALCON Yes, we got them all in.

CAPCOM Okay, we'll ask you for them later.

FALCON Okay.

PAO Range is about 2 1/2 miles now. Range rate 29 feet per second.

ENDEAVOUR Houston, Endeavour.

CAPCOM Hello, Endeavour. Standing by.

ENDEAVOUR Okay, TV go.

CAPCOM Say again.

CAPCOM Roger, copy TV go.

CAPCOM Endeavour, Houston. We're not copying your high gain, yet.

ENDEAVOUR Okay.

CAPCOM We've got a black and white picture now. Be coming in color in just a minute.

CAPCOM We have your picture, Endeavour.

ENDEAVOUR Roger.

ENDEAVOUR Okay, I've got you visually there, Falcon.

ENDEAVOUR Yes, you're looking good.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 173:07 CDT 13:41 MC515/1

IRWIN You're very garbled, Dave, say again.
SCOTT Okay, I got you at 1.28 miles.
SCOTT Okay, I'll be right with you.
CAPCOM Endeavour, Houston, give us auto on the high
gain, please.
SC On auto.
SC Hey, one mile and 27 feet per second on
the radar.
CAPCOM Rog.
CAPCOM Endeavour, Houston. Do you have the Falcon
on your monitor?
ENDEAVOUR No, I wasn't watching it, Ed, stand by one.
CAPCOM Okay, 3000 feet, breaking down to 20.
CAPCOM Don't waste any time on it, Al.
ENDEAVOUR 1500 feet breaking down to 10.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 17314 CDT 1348 516/1

FALCON Okay 500, breaking to 5.
FALCON (Garble).
ENDEAVOUR (Garble).
FALCON Okay, Houston we're stationed at about 100
during the command module picture, and we'd like for you to
take - -
CAPCOM If you're not familiar I can give you a page
number in your LM data systems book. Just take a look at it.
FALCON Okay, stand by one.
ENDEAVOUR No, it's not - it's not in the LM data catalog
(Garble) cycle, it's on the body of the camera.
CAPCOM We've got a picture of it, Al.
ENDEAVOUR Course tells them what feet to take the picture
at.
FALCON Okay, we'll get a picture of it.
FALCON Okay, I'll go ahead and do your picture.
ENDEAVOUR Hey buddy, give me a call when you start.
FALCON Okay.
FALCON Houston, what page is that on in the LM check-
list book?
CAPCOM Okay it's page 43 in the LM's system's book -
data book.
FALCON Okay.
CAPCOM Okay, on the right hand side, Dave, you see that
one little line that says, mapping of pan cameras in view
press systems assembly.
FALCON We haven't got it out yet, stand by.
CAPCOM Okay.
FALCON Yes, I'll go the higher rate, Dave. kay, here
we go.
CAPCOM Go ahead.
FALCON Hey, it looks good your going the right way.
CAPCOM Dave, while he's pitching, I'll tell you -
in about the middle of the page at about center.
FALCON Very nice maneuver, Endeavour.

END OF TAPE

FALCON Okay Houston. We don't see them labeled in here, is the label, Ed, on the picture.

CAPCOM Negative, as soon as you have the picture I'll tell you where to look.

FALCON Okay, we got the picture, tell us where to look.

CAPCOM Okay, way over on the right hand side where it says mapping and pan cameras into present system assembly. It's on the right picture.

FALCON The one with the covers open.

CAPCOM That's affirm. Between the end of that aerial and the lens about half way is a little dot. This represents the V over H assembly. Now the camera lens will be covered, rather it will be folded up so you will not be able to see it. However that is the item you are looking for represented by the small circle about half way up between the end of the aerial and the lens of the camera.

FALCON Okay, I see a small circular object there just to the right of the handle and I don't see anything covering it.

CAPCOM You talking about the diagram, or in the SIM Bay?

FALCON On the SIM Bay.

CAPCOM Okay, that's what we wanted to know.

FALCON Yeah, it's a little round black holder type affair, right?

CAPCOM That's it, that's it, right. If you can snap a picture of it, we'd appreciate it.

FALCON Okay we'll get one in, stand by. Okay we've got the picture, Houston, and we'll proceed on with the docking.

CAPCOM Thank you, Sir.

ENDEAVOUR Okay, I'll pitch back around now, Dave.

FALCON Okay.

CAPCOM Falcon, Houston. Do you have any comments on the SIM Bay, anything look out of the ordinary?

FALCON No, it looks very clean, the doors are all covered and all the booms are retracted, and it looks neat and tidy.

CAPCOM Thank you.

ENDEAVOUR Okay, where did you go.

FALCON We should be right where we were. Have you completed your maneuver?

ENDEAVOUR Rog.

FALCON Okay, we are in the same initial attitude, I'll come back around to you. Just stay there.

FALCON Here we come.

ENDEAVOUR Okay Dave, you would go to station keeping.

FALCON Okay, Endeavour you have the station.
ENDEAVOUR Okay.
FALCON (garble)
FALCON (garble)
ENDEAVOUR Hey Houston, ready to give you those
(garble)
CAPCOM Stand by.
FALCON Roger (garble)
CAPCOM Okay, bring it on.
SPEAKER Roger 1, roger 2.
CAPCOM Go for PYRO ON.
FALCON Roger

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 17335 GET 1409 CDT MC 519/1

ENDEAVOUR I got barberpole.
FALCON There I got you.
CAPCOM Roger.
FALCON -- three. Okay, you ready to come in?
FALCON Roger.
FALCON Hard dock.
CAPCOM Roger, roger. Copy hard dock, and Falcon,
if you'll give us 105 and 67, we should have your steerable.
FALCON Roger, 105, 67.
SC Good show, Endeavour, it's nice to be
aboard again.
SC Welcome home.
SC Thank you.
CAPCOM And Falcon, Houston, now that we have the
steerable back, when you get a moment, pull the ECS auto-
transfer OPEN, and then the glycol pump #1 OPEN.
SC Roger, ECS auto-transfer is OPEN, and I'll
open the glycol pump #1 now.
CAPCOM Roger. We want to get a little data down
here.
SC Okay, do you want us to select too, or just
let it run?
CAPCOM Negative, just wait - will 30 seconds.
SC Okay, we'll stand by for your call.
CAPCOM Thank you.
SC And, Houston, Falcon, do you have an update
for us for the LM weight/ CSM weight?
CAPCOM Roger, stand by. LM weight 5444.
SC Roger, LM weight 5444.
CAPCOM I don't have the CSM weight at the moment and
you can close the glycol pump #1 first and then the auto-
transfer.
SC Roger, closing glycol pump #1 now; auto-
transfer now.
CAPCOM Roger, and I thank you.
PAO Docking time was 173 hours, 36 minutes,
27 seconds.
SC Alright, I got it.
CAPCOM And Endeavour, Houston, a couple of changes
to the Command Module, LM/Command Module transfer list on
stowage items when you can a break.
SC Okay, Houston, stand by 1.
CAPCOM Falcon, we'll take data and update you.
SC You've got it.
SC Okay Houston, Endeavour, you might as well
give me those updates now.
CAPCOM Okey-doke, Endeavour, on page 2 uh 283 -
SC Okay, go.
CAPCOM Okay, Al, about the middle of the LM to
Command Module transfer list, the second decom bag and the

APOLLO 15 MISSION COMMENTARY 8/2/71 17335 GET 1409 CDT 519/2

CAPCOM -- 4th decom bag, scratch.
SC Understand, scratch 2nd and 4th decom bag.
CAPCOM That's affirm and at the bottom, write
collection bag 3 and A9.
SC Understand, add collection bag 3 and A9.
CAPCOM Roger, and they're going to give you the
section of core stems 3 sections long; you're out to put
that on the left hand tray along A1 and A2 and secure it with
with either your LM tie-down rope or your extra webbing in
there.
SC Roger, I understand, the core tubes go
along A1, A2, tie-down on the on the tree.
CAPCOM That's affirm, you got it.
SC Dave, you want to verify this dump valve
in AUTO?
CAPCOM Roger, stand by 1.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 173:42 CDT 14:16 MC520/1

ENDEAVOUR Dave, you want to verify that the dump valve
in auto?

CAPCOM Roger, stand by one.

FALCON Verify.

ENDEAVOUR Okay, I'll go ahead and start equalizing
the pressure.

FALCON Okay, good.

CAPCOM And Falcon flight . . Falcon, Houston.
FIDO's on pins and needles for your TPI solution if you can
get a moment to feed it to us.

FALCON Rog, we'll do it right now. Okay, Houston,
I assume that you got the recycle before we went around
the corner there.

CAPCOM That's affirm.

FALCON Okay, on the final comp, I'll read PGNCS,
AGS and CMC, if you are ready to copy them in that order,
in local vertical co-ordinates.

CAPCOM Roger, ready.

FALCON Okay, PGNCS plus 70.3 plus 5.9 minus 17.7.
For the AGS plus 70.4, plus 5.9, minus 19.1. The CMC minus
69.1, minus 6.1, plus 16.1. We burn the PGNCS on time,
and we had about a 4 foot per second overburn on the APS
which we trimmed out to 2/10ths.

CAPCOM Copy.

FALCON Okay, the residuals were . . on the page after
the trim were plus .2, plus .2 and minus .4.

CAPCOM Copy. And assume mid-courses is reverse.

FALCON Rog, we'll give you those too. Okay and
I'll give you the same answers for mid-course one if you
are ready to copy it.

CAPCOM Okay.

FALCON Okay PGNCS was minus 1.1, 0 and minus 1.1.
AGS was minus 1.5, 0 and minus 3.0, CSTSM plus 1.5, minus
.2 plus 1.9 and we burn the PGNCS solution to 0.1 and .2.

CAPCOM Thank you Dave, that's about it, appreciate
it.

FALCON Okay, you want mid-course two.

CAPCOM No, we'll take your PGNCS . . we'll take all the
rest of them and look at them later.

FALCON Okay, fine. It was pretty smooth all the
way, every thing looked nice and the data went in very
well, and I thought it was a super rendezvous.

CAPCOM Very good, you can (garble)

FALCON Yeah, but you know, these systems are just
magnificent.

CAPCOM Yeah, they sure are, Dave. Okay, we suggest
you press right along with your transfer and cleaning up.

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FALCON Rog, we're in work right now.
CAPCOM And whenever Jim is ready to do the
targeting, we'll read him a pad on that one.
FALCON Okay, stand by, we'll give you a call.
PAO This is Apollo Control at 173 hours 47
minutes. The docked Falcon and Endeavour are in orbit,
64.1 by 53.8 nautical miles.
FALCON Ready to copy the impact pad.
CAPCOM Okay, understand you are ready for the
LM impact pad, Jim is that correct?
FALCON Yes, and that's a JETT pad.
CAPCOM Okay, it's a P30 pad 4179 06 2250 NOUN 81
minus 01219 plus 00560 plus 01488 00711 minus 00371 02003
127 047 174 the rest is NA, the LM weight is 5444.
FALCON Roger, read back for P30 pad, 179 06 2250
minus 01219 plus 00560 plus 01488 00711 minus 00371 02003

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 17349 CDT 1423 521/1

FALCON I have 01219 plus 00560, plus 01488 00711, minus
00371 02003, 127 47174 and LM weight is 5444.

CAPCOM Good read back, Jim.

CAPCOM And Falcon, Houston. The computer's yours.

FALCON Rog.

CAPCOM And we want to leave it in data of
course.

FALCON Okay, we'll leave it in data. It's all yours now.

CAPCOM Endeavour, Houston. Before you get LOS and
get too busy with transfer, I need to give you a camera
photo pad for the next pass.

ENDEAVOUR Okay, go ahead, Houston.

CAPCOM Okay, this is the one on that 17450, Al. T
start for the map camera - T start 1745004, T stop 1754936.
Your image motion DB plus 4 at T start and DP at 1753000, and
your pan camera photo pad, we copy your 17520. T start 1753432
T stop is 3652.

ENDEAVOUR Roger, Ed. Understand mapping camera photo
pad is T start 1745004, T stop 1754926 and at T start you
want image motion to go barber pole plus 4.

CAPCOM Thats affirm.

ENDEAVOUR And, at 17530 you want image motion to go to
barber pole.

CAPCOM That's affirm, Al, and the correct time for the
T stop on that was 1754936.

ENDEAVOUR Understand, 4936. And the pan camera photo
pad is T start 1753542, T stop 1753652.

CAPCOM Roger, the T start 1753432, T stop is good.

ENDEAVOUR Understand, T start is 1753432.

CAPCOM That's a good read back now, Al.

ENDEAVOUR Yes, thats pressurized, Jim. Can you read me?
Okay tulls pressurized and I'm up in it now checking the
legend.

PAO That cabin pressures are equalized, now.

FALCON Oh, Houston. The falcon is back on its roost,
and going to sleep.

CAPCOM Very good.

FALCON She's all yours now, Ed. We're going to 12
com and put her to bed.

CAPCOM Okay, one item, Dave. Your not marking these
bags before you head them down, are you.

FALCON The bags are all numbered. We've got the col-
lection bags and the cover bags with the proper numbers on
them and that was all we're finding to do.

CAPCOM Okay, your not helping him with the stowage
when you pass them in are you. I would change your flight
plan if you did, other wise I'll just give it to him.

FALCON Well, I guess the best thing would be to go
ahead and give it to him. Because we'll just pass them over

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FALCON then.

CAPCOM Okay, I've given them to him already, thank you.

FALCON Yes, that fine he's got a much better handle
on the stowage over there anyway, than we do.

PAO This is Apollo control at 173 hours 59 minutes.
Dave Scott and Jim Irwin are powering down Falcon, now. We'll
be off communications for some time. They'll power down the
LM and transfer the equipment and samples into the command
module.

CAPCOM Endeavour, Houston.

ENDEAVOUR Houston, Endeavour. Go ahead.

CAPCOM Al, we observed when your P79 just before the
docking that you kind of P00 D0. Do you have any words on
that.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 CST14:36 GET174:02 522/1

ENDEAVOUR Houston, Endeavour, go ahead.

CAPCOM Al, we observed when your P79, just before your docking that you got a Poo do. Do you have any words on that?

ENDEAVOUR No I don't Ed.

CAPCOM And Endeavour, Houston, we're going to have to update your flight plan with a couple of items before you go around the corner, whenever you can get around to it.

ENDEAVOUR Okay, Ed, let's go ahead and do them now.

CAPCOM Roger, and Al, give us a verb 74 when I'm talking to you.

ENDEAVOUR Rog, verb 74.

CAPCOM Okay, the first flight plan update is at 174:12.

ENDEAVOUR Okay, go ahead.

CAPCOM Okay, where it says the mapping camera lazer experiment covers open, ect. ect., delete that.

ENDEAVOUR Rog, go ahead.

CAPCOM And the second line after that, the map camera track, ect. ect., delete that, and we're going to move those to 174:40.

ENDEAVOUR Okay, understand.

CAPCOM Okay, down a little bit in the next group of words, where it says lazer altimeter on at 174:17 we're going to scratch that.

ENDEAVOUR Okay, scratch lazer altimeter.

CAPCOM Going to move that to 174:49.

ENDEAVOUR Roger, move to 174:49.

CAPCOM Okay, and at 175:49, going to add another lazer altimeter off.

ENDEAVOUR Rog, understand at 175:49, lazer altimeter off.

CAPCOM Okay, the next item is at, stand by on that a minute, and at 175:54, delete the lazer altimeter off.

ENDEAVOUR Understand at 175:58 delete lazer altimeter off.

CAPCOM That's affirm.

ENDEAVOUR Okay.

CAPCOM And at 176:02, the next page, right after all those words, we want to add in the map camera, that's about 176:02, map camera lazer experiment covers close talk backs barber polls/gray and then off. Looks like that item came down there about 4 minutes later, Al.

ENDEAVOUR Roger that, I see it now.

CAPCOM Yea, I just now saw it too, and I presume

CAPCOM they want it moved up there a few minutes. And at 178:02, oh sorry about that, at 177:56 put in a logic power 2 off.

ENDEAVOUR Okay, I understand logic power both of them off at 177:56.

CAPCOM Rog, next page 178:02, lazer altimeter on, delete.

ENDEAVOUR Delete lazer altimeter on at 178:02.

CAPCOM Okay and at 179:40, following page, delete lazer altimeter off, and about 179:41 delete those 2 lines, map camera lazer experiment covers and logic power 2 off, delete those.

ENDEAVOUR Okay, delete the 3 lines at 179:40, lazer altimeter mapping camera covers and logic power off, delete those 3 lines.

CAPCOM Okay, I think we got them all that time, thank you.

ENDEAVOUR Okay.

CAPCOM And Endeavour, Houston, if you can holler at Dave and Jim, and remind them to get their radiation meters out of their pockets. We'd still like those readings we didn't get earlier.

ENDEAVOUR Roger, Houston.

END OF TAPE.

APOLLO 15 MISSION COMMENTARY 8/2/71 CST14:44 GET174:10 523/1

ENDEAVOUR Roger, Houston.

CAPCOM Okay Endeavour Houston, can we have auto on the high gain and request Falcon to go to Aft Omni as he goes over the hill, or after he's over the hill.

ENDEAVOUR Okay, you want Falcon to go to Aft omni.

CAPCOM Yea, at LOS, and you're about 3 and a half minutes from LOS now.

ENDEAVOUR Okay, I'm in auto and they're going to go to Aft Omni at LOS.

CAPCOM That's affirm.

CAPCOM And ask them when they do that to verify track mode slough.

ENDEAVOUR Thank you.

CAPCOM And Endeavour we're about 40 seconds from LOS see you on the other side.

ENDEAVOUR Okay, Ed, thanks much.

PAO This Apollo Control at 174 hours 14 minutes. We've had loss of signal from both spacecraft as they go behind the moon and on the 49th revolution for Endeavour. As we acquired the Falcon on this pass, Dave Scott reported a good terminal phase initiate burn. He reported he had performed 2 small midcourse corrections, and at that time could see the command module. The breaking in the rendezvous went well. Al Worden brought the television up a few minutes early. We lost the picture for a while when the high gain antenna went to wide beam while Worden was maneuvering Endeavour for its inspection by Dave Scott and Jim Irwin. The picture came back in time for the docking, we copied the time of hard dock at 173 hours 36 minutes, 27 seconds. We're showing the spacecraft in a lunar orbit of 64.1 by 53.8 nautical miles, with an orbital period of 1 hour 58 minutes 33 seconds. The crew of Falcon has powered down the lunar module and is preparing to transfer the lunar samples into the command module. We'll reacquire both spacecraft in 33 minutes from now. At 174 hours 16 minutes this is Mission Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 17458 CDT 1532 524/1

PAO This is Apollo control at 174 hours 58 minutes.
We're a little over 30 seconds away from acquisition of signal.
There will be a news conference at 8:30 AM tomorrow on the
lunar surface activities conducted by Astronaut Jack Schmitt.
This news conference will be in the main auditorium. We'll
stand by now for first words on this 50th revolution.

CAPCOM Apollo 15, Houston. Standing by.

ENDEAVOUR Houston, 15. Still in the midst of doing a
little house cleaning.

CAPCOM Okay, kind of figured that, Al.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 17505 GET 1539 CDT MC525/1

CAPCOM Endeavour, Houston, would you ask Falcon to switch to forward OMNI?

SC Rog Houston.

CAPCOM And, Al, do you want to verify that you got your mapping camera started at 174:50?

SC Roger, Ed, with 1 minute late on that - on the mapping camera, but we got it, started at 174:51.

CAPCOM Okay, Al, thank you.

SC Houston, 15.

CAPCOM Go ahead, 15.

SC Roger, Ed, one other thing, I didn't get the P52 at E.

CAPCOM Okay, I understand, no P52.

SC Affirm.

CAPCOM Al, I'll keep track of your cameras for you and give you a warning on the stop and starts.

SC Okay, if you would, that would help.

CAPCOM 15, Houston, give me REACQ and NARROW, please.

SC Okay, REACQ and NARROW.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 175:10 CDT 15:45 MC526/1

CAPCOM 15, Houston, we're having a lot of trouble with the LM comm. Apparently we're right at the midst of the OMNI. Let's try aft.

ENDEAVOUR Houston, I was talking with Dave, say again please.

CAPCOM Roger, let's try the LM aft OMNI again, please.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 17515 CDT 1550 527/1

CAPCOM 15, Houston.
ENDEAVOUR Roger, go ahead.
CAPCOM How about the gamma ray gain switch step it
3 times for us please Al.
ENDEAVOUR Okay, 3 times.
CAPCOM Apollo 15, Houston.
ENDEAVOUR Houston, 15.
CAPCOM Al, we're going to change your mapping camera
procedures. I'm going to call them to you on time rather than
read them to you now. So press on and I'll give you a warning
here in about 5 or 6 minutes.
ENDEAVOUR Yes, that'll be fine, Ed. Just give me a couple
minute warnings so I can get over to the camera. As you
probable know the LEB timers not working.
CAPCOM Rog, I'll keep you posted on time, press on.
ENDEAVOUR Okay.
CAPCOM Apollo 15, Houston.
ENDEAVOUR Go ahead, Houston.
CAPCOM Al, we observe that your - you've got P00 up
instead of P20. Better check your attitude and get her back
in P20, and let's see if that camera if pointing at anything.
ENDEAVOUR Okay.
ENDEAVOUR Houston, 15.
CAPCOM Go ahead.
ENDEAVOUR Rog, that just happened about 15 seconds ago,
you must have caught it just as it went to P00. And I don't
think we're even out of the dead band.
CAPCOM Very good. And Al, just stand by, we still
got a couple of minutes, yet. What I'm going to do is have
you retract the mapping camera with it still running. And
then turn it off when we're running a little test on it, and
I'll call that for you in a couple of minutes.
ENDEAVOUR Okay.
PAO P20 is the orbital rate program which we want
for the camera operations in the SIM BAY.
CAPCOM Apollo 15, Houston. Stand by to retract the
mapping camera.
ENDEAVOUR Okay, stand by.
CAPCOM Mark, start retracting.
ENDEAVOUR Okay, it's retracting now.
CAPCOM Take about 4 minutes, Al, and I'll call you
after that.
ENDEAVOUR Okay.

END OF TAPE

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CAPCOM Apollo 15, Houston, turn your mapping camera off.

ENDEAVOUR Okay, Ed, mapping camera going off.

CAPCOM Roger, the lazer altimeter off, and the map camera lazer covers closed.

ENDEAVOUR Okay, lazer altimeters off.

CAPCOM And I'll have the pan camera T start here in just about 2 minutes. I'll call you and give you 15 or 20 seconds warning.

ENDEAVOUR Okay.

CAPCOM 15, Houston, stand by for T start on the pan camera.

ENDEAVOUR Stand by.

CAPCOM Mark T start, pan camera. 15, Houston, stand by for pan camera off.

ENDEAVOUR 15, Rog.

CAPCOM Mark, pan camera off.

ENDEAVOUR Rog. Off.

CAPCOM Okay Al, that completes all that for us, thank you.

ENDEAVOUR Okay, Ed, thank you very much.

CAPCOM Go ahead, 15. Okay, Apollo 15, Houston. We're getting a little itchy for some LM data. We'd like for them to bring up the sterrable if they can please at 146 and 29.

ENDEAVOUR Okay Ed, have them bring up the sterrable.

CAPCOM Roger, angles 146 and plus 29.

ENDEAVOUR Understand angles 146 and plus 29.

CAPCOM And 15, we verify that your pan camera is in and you can turn the power off on it.

ENDEAVOUR Okay.

CAPCOM 15, Houston, you can start your maneuver to jettison attitude at any time and I have a slight update to the attitude.

ENDEAVOUR Okay Houston, 15, stand by 1.

CAPCOM Roger, standing by. 15, Houston, your gamma ray gainstep shield off, please.

ENDEAVOUR Okay Ed, gamma ray gain shield, going off. Houston, 15.

CAPCOM Go ahead, 15.

ENDEAVOUR Okay, Ed, it looks like the caos is slowing down a little bit here if you want to talk about the flight plan.

CAPCOM Okay, Al, you can start your maneuvering to your LM jettison attitude most anytime, and I'll update the attitude for you. It's roll 14, pitch 38 and yaw 344.

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ENDEAVOUR Roger understand the LM jettison
attitude is roll 014 pitch 038 and yaw 344.
CAPCOM Rog, and the time is 177:20:33.
ENDEAVOUR Understand, Jettison time is 177:20:3300
CAPCOM That's right and the CSM sep time here
is 177:25:33.
ENDEAVOUR Understand, the CSM sep is 177:25:
33.
CAPCOM Rog, and your CSM weight for your
DAP is 36 370.
ENDEAVOUR Understand DAP weight is 36370.
CAPCOM Rog, and I'll call this gamma ray
gain step shield back on Al, we want to let it go for 10
minutes yet.
ENDEAVOUR Okay, gain step comes back to shield
on.
CAPCOM Negative, negative, I'll call it
back on in 10 minutes.
ENDEAVOUR Roger roger, understand.

END OF TAPE

CAPCOM Apollo 15, Houston.
SC Houston, 15, go ahead.
CAPCOM Rog, would you ask Dave and Jim to make sure that we go ahead and get steps 4 and 5 on page 14 of their checklist before LOS here and then as soon as we get into attitude, we can take a look at all this before we go LOS. We got about 16 minutes.
SC Understand that's steps 4 and 5 on page 14.
CAPCOM That's affirm.
CAPCOM And, Apollo 15, Houston, also go ahead and get the P30 in, etc, etc.
SC Rog, understand, go ahead and get the P30 in the LM.
CAPCOM And there is no update to the TIG, it's good as given to you earlier.
SC Rog, understand, TIG is good.
CAPCOM And Al stand by to turn the gamma ray gain-step shield on.
SC Gamma ray shield on.
CAPCOM Okay, mark ON and lets take the map camera on switch to stand by and the map camera image motion off.
SC Okay map camera stand by, image motion off.
CAPCOM That about cleans us up, Al.
SC Okay, Ed, thank you much for your help.
FALCON Oh, Ed, I'm back on comm, over in the Falcon.
CAPCOM Okay Jim, sounds good, should be an attitude in just a minute, and you're angles 205 and 70 as in the Flight Plan should be good and we're about 13 minutes LOS.
FALCON Okay, do you have any updates for me before we have LOS?
CAPCOM Negative, all we wanted to do was just the Guidance Systems, state vector's okay and configured before LOS and I don't believe we have an update, I'll check.
CAPCOM Falcon, Houston. We'd just like to complete down through step one or two of configure AGS before LOS, and Endeavour, if you can give us and Accept, we'll shoot you an uplink before LOS.
ENDEAVOUR Okay, it's in ACCEPT.
FALCON Falcon copies.
ENDEAVOUR You got ACCEPT.
CAPCOM Understand.
FALCON Ed, can you get form the P30 load here for me as I go through it.
CAPCOM Okay, stand by one. Okay go ahead. Got the first one.
FALCON Okay, how does that look?
CAPCOM Looks good. Looks good here, Jim.

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FALCON Okay, I'll (garble)
FALCON Okay, I'm going to go to P00.
CAPCOM Rog, Jim, that one looks okay too, don't
see much of it.
FALCON That's right. Okay, do we have a GO for
closeout?
CAPCOM Give us a 470 readout on the data, please.
FALCON Okay, you have it.
CAPCOM Okay, and Jim, can you verify that you've
done all of step 2 on the comm?
FALCON Yes, I meant slough on the track mode.
CAPCOM Okay Jim, you're GO for closeout. The next
time we see the LM, you'll all be buttoned up, so suggest
you make a very careful check of the items from now on.
FALCON Okay, thank you Ed.
CAPCOM And Endeavour, its your computer.
ENDEAVOUR Yeah, roger Ed.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 17608 GET 1642 CDT MC530/1

CAPCOM Okay, Endeavour, Houston, we're a minute and 20 seconds from LOS. Your ascent CAPCOM's going off duty, and I'll see you back on earth. It's been a lot of fun getting you up there.

SC Okay, Ed, you're - thanks a million, pal, you've been a great help and it was fun talking to you.

SC Hey Ed, Falcon, looks like we just about got things cleaned up here.

CAPCOM Very good, guys, we'll see you in a few days, thanks a lot.

SC Okay, Ed, thank you.

PAO This is Apollo Control at 176 hours, 12 minutes and we've had loss of signal on the 50th revolution. Dave Scott and Jim Irwin still in the lunar module but preparing to close it out. By the time we reacquire, they will be back in the Endeavour with the lunar module set up for jettison and later deorbit burn and impact on the lunar surface. During this pass, they transferred the lunar samples to the command module. Al Worden remarked they were doing some housecleaning, obviously a lot of dust and dirt comes up with those samples and they use the vacuum cleaner to clean up the cabin after the transfer. Al Worden in Endeavour conducted more orbital science during this pass while Dave Scott and Jim Irwin were configuring Falcon for the deorbit. Here in the Control Center, Flight Director Milt Windler is preparing to hand over to Flight Director Glynn Lunney and his team of flight controllers. We're estimating the change of shift news conference for 5:15 P.M., Central Daylight Time. At 176 hours, 14 minutes, this is Mission Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 17624 CDT 1758 531/1

PAO This is Apollo control at 176 hours 23 minutes. The change of shift briefing scheduled for 5:15 has been canceled to repeat the change of shift briefing scheduled for 5:15 has been canceled. And to repeat an earlier announcement. A news conference on lunar surface activities will be held at 8:30 AM tomorrow in the main MSC auditorium. Astronaut Jack Schmitt, the backup lunar module pilot for Apollo 15 will be present at that news conference. This is Mission Control, Houston.

END OF TAPE

PAO This is Apollo Control at 176 hours 56 minutes. We'll be reacquiring the command module, Endeavour, still docked with the lunar module Falcon in about 2 minutes. At that time we expect that all 3 crewmen will be buttoned up inside the command module, and on this revolution will be preparing to jettison the lunar module and perform a small separation maneuver with the command module prior to lunar impact. Glynn Lunney, the flight director for this shift has completed a review of the status of the mission with each of his flight controllers, and essentially that status is as follows, for the command module, during the evening, the simbay will have the following experiments deployed, the gamma ray and alpha particle sensors, that'll be on this coming revolution, however we will not be getting data from those 2 sensors because the spacecrafts will be in the separation attitude, which is not a suitable attitude for recording the particle data, and the gamma ray data. During the sleep period, Al Worden will wear the light weight headset and will have the watch to give Jim Irwin, and Dave Scott maximum opportunity for a good nights sleep. In the way of continuing problems, the Laser altimeter in the scientific instrument module bay is still not functioning and we are about to write that off as broken. We don't expect that it will begin functioning. The pan camera, the Laser altimeter, by the way is used with the mapping camera to provide altitude information on each of the frames that is shot. The panoramic camera is generally functioning well, however about 1 frame out of 10, or about actually about 20 percent of the frames shot with that camera are, we think, being smeared because of a problem with the sensor called the A over H sensor which senses the altitude at which a photograph is taken and rocks the camera on a pivot to compensate for the motion, and about 1 frame out of 8 or 9, this sensor is apparently sending either the wrong command, or the command is not being processed properly and the rocking motion is not as it should be and the frame is apparently being smeared, but all the rest of them would appear to be good frames. The mass spectrometer, we continue to have a problem with the boom, it doesn't appear to be a serious problem at this time, the instrument itself is functioning very well, providing very good data. We have, on several occasions when retracting the boom, the 24 foot boom, that the sensor is mounted on have found that the retraction is slower than we would expect, which gives an indication that perhaps it's hanging up, and, other than that, all of the simbay instruments are

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PAO functioning well, providing excellent data. We just had a call to the crew. We'll stand by for that.

SC Hello Houston, 15, how are you?

CAPCOM Roger, doing fine down here. Can you fellows confirm LM closed out and ready for jet.

SC Rog, LM's closed out and we're just now running our pressure integrity check and we'll be all set in a jiffy.

CAPCOM Roger.

PAO Dave Scott reporting that the LM is ready for jettison on time. The spacecraft communicator on this shift is Astronaut Robert Parker. During the LM impact, Doctor David W. Streinway, Chief of the Geophysics Branch at the Manned Spacecraft Center, will be available in the MSC newscenter briefing room to provide background information and answer questions on the LM impact and the seismic data that is received. That will be at 8 PM in the MSC newscenter briefing room. Also in the way of briefings, tomorrow morning at 8:30 AM there will be a lunar surface science briefing with Astronaut Jack Schmitt, and that will be at 8:30 AM in the main auditorium of Building 1. Also at 10:AM there will be a subsatellite briefing given by TRW. At the present time Apollo 15 is in an orbit of 52.7 at its low point with a high point, or apocynthion of 64.8.

END OF TAPE

SC Houston, 15.
CAPCOM Go ahead 15.
SC Okay, we are going to be a few minutes here, we got to put some LCG plugs in our suits and it's going to take probably about 10 or 15 minutes to get all that done.
CAPCOM Okay, and we'd like a verification from Al that x-ray is in standby and x-ray alpha covers are at closed before jet and set burn.
SC Okay, we'll get that for you when we get squared away here.
CAPCOM Yeah.
CAPCOM Apollo 15, Houston.
SC Houston, Apollo 15, go.
CAPCOM Say Dave, beautiful job today there, all the way around. Hey, one quick question . . . how come you guys need plugs for those suits?
SC Well, because apparently the LCG connection on the inside won't hold an air seal, so we're getting them taken care of with these special extra little blue plugs we got that are airtight on the inside. At least that's our first guess of . . . of why we didn't get a good suit integrity check or didn't even get a good buildup in the suit pressure.
CAPCOM Rog, we . . . we had a complete misunderstanding on that, the reason I asked the question, because we thought those plugs only were required when the LCG was not on. We could have caught that one for you down here, Dave, there's something screwy here.
SC Okay, well we'll put these plugs in and run another pressure integrity check and see how it works.
CAPCOM Rog.
CAPCOM 15, Houston.
SC Houston, 15 - go.
CAPCOM Rog, Dave, you guys talking about inside plugs or outside plugs?
SC Inside plugs.
CAPCOM Roger.
PAO This is Apollo Control. The plugs that are being discussed between Dave Scott and Donald K. Slayton, Director of Flight Crew Operations at the Manned Spacecraft Center, is a liquid cooling garment plug. It plugs the inside of the hole or the feed thru in the suit where the water is normally brought into the suit from the backpack, the portable life support system. Of course, in suit operations inside the spacecraft, the backpack is not required and there is a plug on the inside of the suit

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PAO that should seal this. Apparently Scott and Irwin were having some problems getting their suits to maintain pressure and were checking this particular plug . . . just a few moments ago the EECOM, Environmental and electrical systems engineer for the Command Module reported that it appeared from the telemetry data that they had got the problem squared away and were getting a good pressure integrity on the suit. We'll continue to follow the situation, there is no particular problem as far as the LM jettison is concerned if the jettison is somewhat late we can make up the difference by the time of ignition for the deorbit burn, and still get impact at the desired point.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 17718 GET 1752 CDT 534/1

SC Okay, Houston, 15, we've got a good suit circuit now.

CAPCOM Roger, we've been looking at it, copy, agree. And 15, we're still looking for an X-ray/alpha door CLOSE.

SC Okay, stand by 1, Houston.

CAPCOM Roger.

SC Okay Houston, the X-ray/alpha door is closed.

CAPCOM Copy.

PAO The spacecraft is now in the proper attitude for the separation, jettison and separation. And you heard Dave Scott report that, and we confirmed through telemetry on the ground, that their suits are now holding pressure as they should. Apparently they've gotten problem, whatever it was, with the --

SC Houston, 15.

CAPCOM Go.

SC Okay, we're ready to arm the logic.

CAPCOM Roger, we're looking.

SC Okay. Logic 1.

SC Logic 2.

CAPCOM Roger, you GO for pyro arm.

SC Roger.

PAO We do have a good seal on the plugs for the liquid-cooled garment fittings on Irwin's and Scott's suits. And we're moving toward the LM jettison at 177 hours, 20 minutes, 33 seconds and separation 5 minutes later at 177:25:33. We're counting down to separation, rather to jettison, in 2 minutes, 47 seconds.

SC 15, LM/CM DELTA-V is 2.5. 2.0, excuse me.

CAPCOM Copy, 2.0.

SC Houston, 15.

CAPCOM Go.

SC Houston, 15.

CAPCOM Roger 15, go.

SC Okay, the LM/CM DELTA-P doesn't look exactly right to us. What do you think?

CAPCOM Stand by. 15, Houston, we'd like to get another pound out of there, we're showing about 3.5 in there.

SC Okay, we had a suspicion that possibly the LM overhead dump valve was open and it might be.

CAPCOM We don't think so down here.

SC Okay, well, we'll go to tunnel vent for a little longer, must just be slow then; we've been in it for probably about 15 minutes.

CAPCOM Copy. 15, what position are you in when you're reading that out, in vent or in DELTA-P?

SC DELTA-P.

CAPCOM Roger.

SC It's up to about 23 now and I've been holding it in tunnel vent.

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CAPCOM 15, we'll take that, it'd take too long to get it down, we believe, so let's press on with JETT to DAP pressure.

SC Okay, well, the strange thing about it - we had it up to about 027 or 28 one time and then went back to LM/CM DELTA-P and for some reason it built back up in the tunnel. And I guess the only conclusion we could come to was from the LM, 'cause the hatch is pretty simple and secure in here.

CAPCOM Dave, we think that the increase in the cabin pressure during the suit integrity check could have raised it from your side.

SC Well, okay, that's true.

CAPCOM Bye Dave, confusion reigns down here.

SC Have you seen any -- well, I guess it sorta does up here, too. I wonder if you see any difference in the - ah you can't read the tunnel though, can you?

END OF TAPE

CAPCOM And 15, this is Houston we'd like to verify that you did get a good hatch integrity check back there a ways.

SC Yes that's firm. We got a good hatch integrity check, but, I guess what I'm thinking is that, you know there could be something in the seal there and perhaps the thing to do would be to repressurize the tunnel and pull the hatch down and take a good close look at the seal and then stick it back in. It shouldn't take too long.

CAPCOM Apollo 15, Houston. That seems to be the best conclusion we can come to down here but we'd kind of like to go into a hold briefly. Another indication is, that we would, we are seeing the LM cabin holding steady and not using any oxygen from the ascent tanks, which seems to say that we're not leaking into the tunnel from the LM.

SC Okay, understand.

PAO This is Apollo Control recapping our situation at the moment. We're going to hold off on the LM jettison until we've gotten a more fuller, more complete understanding of the pressure rise in the LM tunnel. We've seen a slow pressure rise in that tunnel.

CAPCOM Verify that the pressure equalization valve is closed.

SC That's verified, it's closed and on the yellow stripes.

CAPCOM Roger, and 15, we'd like to back out of your pyro arm situation right now.

SC Okay Houston, 15, power arm is safe logic is off and the power arm circuit breakers are pulled.

CAPCOM Copy. 15, can you give us a LM, cm delta p reading at this time please?

SC Okay right now it's 3.0

CAPCOM Copy 3.0.

SC And I've had the valve and tunnel vent for the last 5 minutes or so.

CAPCOM Copy. Apollo 15 Houston, recommendation right now is to stop the equal power vents and then we will sit and monitor the CM/LM Delta-P for a short while to see what happens to it. And after that, we're still considering opening up the tunnel to check the seal, over.

SC Okay, we're in LM/CM Delta-P right now and it's reading about 3.1.

CAPCOM Copy 3.1. 15, we'd pull the BB rogue's up.

SC Rog, BB rogue, it's coming off.

CAPCOM And 15, if one of you get's a chance would you put X-ray to stand by, please.

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SC Rog, X-ray to stand by. Okay, Houston
it's in stand by.

CAPCOM Thank you.

PAO This is Apollo Control. We
are going to continue watching the pressure in the tunnel
between the LM and the CSM, for a pressure rise. The pressure
has not dropped as we would expect and this implies that
perhaps there is some leakage into the tunnel since the
LM cabin appears to be stable, we suspect that if there is
leakage it would be coming from the command module side. If
this is the case, the thing we would suspect is some bit of
contamination in the CSM hatch. We're going to continue to
watch the pressure in the tunnel, see what happens, and if
necessary, we'll remove the hatch on the CSM side, inspect
it for any contamination, reseal it, double check the
integrity, and then try to vent the tunnel again. There hasn't
been any resolution as to just what effect this will have on
the LM jettison. The flight dynamics officer has asked the
flight director if he wanted to delay LM jettison for 1
revolution and we haven't gotten a decision on that at the
present time, so we're standing by watching and we'll see
how the pressure check goes on the LM tunnel, and if it
becomes necessary to remove the hatch, we probably will have
to delay jettison for 1 rev.

END OF TAPE

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CAPCOM And 15, if one of you has a chance, would you put x-ray to standby, please.

SC Rog, x-ray standby. Okay Houston, it's in standby.

CAPCOM Okay, thank you.

CAPCOM 15, Houston. Can you give us a reading now on that?

SC Okay Houston, stand by one. It's just a little under 3.1, just a hairline.

CAPCOM Roger, copy, and we're still looking at the possibility of opening the hatch, we're just trying to . . . right now just trying to understand the situation before we open the hatch and destroy the configuration we're in.

SC Okay, we'll stand by.

PAO This is Apollo Control, Flight Director, Glynn Lunney has just advised the Flight Dynamics Officer to be prepared to go either way with the LM jettison. We're holding the option open to jettison this revolution if we get the situation with the CSM tunnel cleared up, however, it begins to look more and more likely that we will be jettisoning the next revolution which would be two hours from the Flight Plan time, and would move the subsequent activities with respect to the Lunar Module, the deorbit burn and the impact also two hours later. Again the situation here is that we are holding the option open to go either way on that, it does appear at this point more likely that we will be delaying the LM jettison for one revolution, 2 hours and this would delay the subsequent activities with the LM, the deorbit burn and the impact by a like amount of 2 hours.

CAPCOM 15, Houston. Could we have another reading in 10 minutes?

SC Well, it's reading right now just about the same that it was when I last called you.

CAPCOM Roger, copy, there is certainly enough uneasiness down here that we think we ought to proceed back through and open both the Command Module hatch and the LM hatch, check the seals on both and the relief valves on both, proceed back through that doing those checks because there could be a very slight leak from the LM that the telemeter guys would not see at . . . for this small volume in the tunnel. Over.

SC Rog, we sort of think that's a good idea too. We'll proceed.

CAPCOM Roger, keep us posted when convenient.

SC Rog, will do.

PAO Flight Director, Glynn Lunney has just made the decision that we will delay the jettison one revolution

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PAO and consequently the subsequent Flight Plan relating to the Lunar Module will also slip by one revolution.

SC Rog, understand, we'll make sure they get cleaned.

PAO This is Apollo Control, one of the problems in diagnosing the pressure rise in the tunnel is that the tunnel volume is very small with respect to the volumes of the cabin in either the LM or the Command Module which makes it very difficult to detect the amount of a pressure loss in either of those vehicles that would account for the pressure rise we're seeing in the tunnel. The amount of oxygen lost would be on the order of 1/100th of a pound and this is really below . . . as they say, below the noise level, almost undetectable. So that's one of the reasons . . . the principle reason we are asking the crew to remove and inspect both the hatches from the LM side and from the CSM side since this is such a difficult problem to diagnose and we don't want to get sealed up and then find that the problem was in the LM hatch all along, so we will have them check the seals on both hatches and seal up the tunnel again and again try to vent and see if we can get a proper vent indicating that we have good tight seals on both hatches. The one revolution delay in the jettison will as we said, slip the events related to the LM impact by about 2 hours. This is an approximation and we'll have to wait for the Flight Dynamics Officer to come up with new event times. The orbital period at the present time is 1 hour 58 minutes, 28 seconds and for preliminary planning purposes this would be a good number to use in computing what the slip will amount to in total time, that's one hour 58 minutes 28 seconds orbital period. Again, though the precise times will have to be computed by the Flight Dynamics Officer.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 17753 GET 1828 CDT 537/1

SC Okay, Houston, 15, both hatch seals are clean, and both hatches are now closed and locked. Do you want to vent the tunnel again?

CAPCOM Roger, go ahead, Dave, thank you. And, 15, are you guys all still fully suited?

SC Rog, we did not break down the suits; we're still locked up.

CAPCOM Roger.

SC And the LM overhead dump valve was verified in AUTO.

CAPCOM Copy.

PAO And that is the proper position for that vent valve.

SC Okay, Houston, we're 1.3 on DELTA-P and coming, coming up.

CAPCOM Copy.

SC Okay, Houston, we're about 2.2.

CAPCOM Copy.

SC And, Houston, do you want to go to 3 and let it stabilize there?

CAPCOM I guess we'll do it with the checklist which is 3.5, right?

SC Well, not really, our checklist says before jettison only - LM tunnel vent valve, LM tunnel vent at least 10 minutes, period.

CAPCOM Okay, stand by.

SC 'Course that's after the hatch integrity check. If we want to go ahead and run through the full hatch integrity check and then we can run up to 3.5 and then run another 10 minutes, I guess.

CAPCOM Yeah, that's the point, Dave, we want to run a complete hatch integrity check in fact after the problem, we may ask you to run it longer than usual.

SC Okay.

CAPCOM Obviously, what we're thinking about here is a bad hatch seal, so we're particularly interested in that.

SC Rog.

CAPCOM And, 15, a reminder, when you're on the back side, the LM is still in 5 degree dead band, so, play it cool with this command module.

SC Rog.

CAPCOM And, 15, what we'd like to see you do is leave that tunnel at 3.5 the entire backside pass, and we'll see what happens to that leak rate. That gives us a nice, long leak check on the hatch. And we'll be satisfied with that DELTA-P for JETT if that's the way it works out on the other side.

SC Okay, and I guess in that case we'll

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SC -- probably break the suits down and then run another suit check before we see you around the corner. So,

CAPCOM Okay, we'll buy that.

SC It's about time for dinner.

CAPCOM I knew there was a reason.

SC Rog. Okay, we're about 3.2 now on the DELTA-P. We'll leave LM in vent.

CAPCOM Rog, I understand, 3.2 and still venting.

SC Rog.

CAPCOM Dave, stand by on taking your suits off, if you haven't taken them off already.

SC Okay. We hadn't planned to take our suits off; we were just going to break off the helmets and gloves so we could get something to eat.

CAPCOM Roger, stand by on breaking the suits down because it's a debate as to whether we want to do another suit integrity check.

SC Okay.

CAPCOM 15, press on, you may, you were permitted to break your suits down, but do not do the suit integrity check 'til you come back around the other side; we can take another look at that tunnel. Over.

SC Roger, understand, will break 'em down and hold off until we see you on the other side.

capcom Okay, good luck.

PAO This is Apollo Control at 178 hours, 11 minutes. We've had loss of signal now with the command module, with the LM still in tow. And to resummarize the situation on that last revolution front side pass: As the spacecraft came into acquisition at the start of this revolution, they were preparing to jettison the lunar module on the scheduled time in the flight plan. However, one of the checks that we run is a pressure integrity check on the tunnel in the command module - the tunnel used by the crewmen to pass from one vehicle to the other - which has hatches at both ends sealing the LM from the CSM. And this tunnel, which is vented down, which in turn produces a pressure differential across the CSM hatch, is checked by seeing how well it maintains this difference in pressure. If the pressure difference changes, it indicates that there's some leakage in the tunnel area. And we saw this sort of a pressure change a rise in pressure in the tunnel which indicated that either there was a leak across the LM hatch or across the CSM hatch into the tunnel. In order to assure that on jettisoning the LM, we had a good tight seal on the CSM hatch, the crew was instructed to open the tunnel up and remove the probe and drogue assembly and check the seals on both the LM and the CSM hatches. They did this, and Dave

PAO -- Scott reported at 177 hours, 56 minutes that the hatches had been checked, they were clean, resealed and ready to proceed. By this time, we had gone beyond the point which we could jettison the LM as per the flight plan. Flight Director Glynn Lunney decided to delay the LM jettison and subsequent activities with the LM for one revolution. After getting the hatches back in place and resealed, the crew will be going through the depressurization of the LM - the tunnel venting procedure again. They're going to let the tunnel depressurize until there is a 3 and a half pound differential in the tunnel compared with the pressure in the CSM cabin. And then they will watch this pressure and we'll read it when they come back around on the front side again at the start of the next revolution and see how well the tunnel has held the pressure differential. If we have a good tight seal at that point, we will proceed with the jettison. The conversation with the crew, just prior to loss of signal, about removing the suits centered around concern here in the Control Center that nothing be done to change the pressure in the Command Module cabin. In removing the suits, there would be nothing that would change the pressure, however, in running a suit integrity check, where the suits are pumped up and then the pressure bleeds off slowly, we do get a change in the cabin pressure. It was decided that there would be no problem in allowing the crew to remove their helmets and gloves so that they could get something to eat on this backside pass. They will then put their helmets and gloves back on, but will not run the pressure integrity check until after we've had a chance to look at the pressure in the LM tunnel. Once the tunnel has been verified, then they'll again run a pressure integrity check on the suits before jettisoning the Lunar Module. At 178 hours, 15 minutes, this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control at 178 hours 53 minutes and we are about 3 minutes away now from reacquiring Apollo 15 on its 52 revolution of the moon. The Command Module and Lunar Module are still docked at present time. We've delayed the jettison for one revolution because of an unexplained rise in the pressure in the tunnel which is used by the crewmen to pass from one vehicle to another which at jettison would have hatches both on the LM side and the CSM side sealing it off. During this backside pass while we were out of radio contact with the spacecraft, Flight Director Glynn Lunney reviewed the situation with his flight controllers and on reacquiring we'll be looking to see that the pressure difference in the tunnel has maintained an acceptable level while the spacecraft was on the backside of the moon. The crew, just before we lost radio contact with them on the last revolution, had vented the tunnel down so that it had a pressure differential of 3 and 1/2 pounds, in other words the pressure in the tunnel was 3 and 1/2 pounds lower than the pressure in the Command Module and if we have a good seal on the tunnel, if we have no leakage across the Lm hatch or the CSM hatch, the pressure in the tunnel should be fairly close to this number. The environmental systems engineer, the ECON has some acceptable leak rates which he will be looking for and will determine if the leak rate across the hatches, either of the hatches is more than acceptable. The previous time on the last revolution when the crew performed this pressure integrity check on the tunnel, part of the operation was done while we were out of radio contact with the spacecraft and on reacquiring the pressure difference, the change in the tunnel pressure, was not one that was necessarily unacceptable except that we had not been able to see how it occurred, and there was some concern that it might have been a rapid change in pressure rather than a slow change, a slow change, if it had been consistent could have been perfectly acceptable, but since there was an element of uncertainty and we could not be absolutely certain that we had good hatch seals, we instructed the crew to pull the hatches, both in the Lm and CSM and check them. We just had a call to the crew, we'll stand by for their response.

CAPCOM Apollo 15, Houston.

CAPCOM Apollo 15, Houston. Over.

CAPCOM Apollo 15, Houston. Over.

PAO Our network controller reports that we may have a ground problem, which is why we are not getting a response from the crew to our calls and he is checking that at the present time to see if we do have a problem on one of

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PAO our ground stations.
CAPCOM Apollo 15, Houston. Over.
PAO We do have telemetry data from the space-
craft but we are not getting voice communications apparently
because of a problem on the ground.
 Goddard voice, Houston contact netone.
CAPCOM Goddard voice, you're loud and clear.
 Apollo 15, Houston, reac and narrow. Over.
PAO Our telemetry data shows that the pressure
in both the LM and the Command Module cabin is normal.
CAPCOM Apollo 15, Houston. Over.
SC Houston, Apollo 15. Go ahead.
CAPCOM Roger, Dave

END OF TAPE

SC Houston, Apollo 15, go ahead.
CAPCOM Roger, do you have any good word for us?
SC I'd say LM/CM Delta-P is off scale high.
CAPCOM Roger, and how did the hatch integrity
check out?
SC Well we've just had it in tunnel vent
all the way around the back side as I think you suggested.
CAPCOM 15, did you ever look at holding it in
Delta P to see how it was holding on that?
SC No we just left it in tunnel vent all
the way around the back side, that's what we'd thought you'd
said to do, we can check it now.
CAPCOM 15, why don't you bring it up to 3.5
and let us watch it for a while, and you watch it. I think
we garbled something there.
SC Okay, our understanding was to let it
go all the way and then you get a good look on this side
so we'll bring it up to 3.5.
CAPCOM 15, Houston, 2 items, 1, we want to
make sure that you are aware that we can not read the tunnel
pressure and so we're depending upon your readouts of this
Delta-P to give us the confidence here in the hatch integrity.
One other item we do know, is that during all that period when
the tunnel was vented our O2 flow was off scale low which
does give us some confidence in the integrity of the hatch,
and meanwhile we're waiting for your call on a 3.5 reading
so we can begin a hatch integrity check, over.
SC Roger, mark 2 minutes and 3.5 plus or
minus 0.
CAPCOM Roger, copy.
SC And I think we have the same confidence
Bob, we noticed the low 2 flow also, the only question we
had was why did the Delta-P change.
CAPCOM That's the same question that is bothering
us.
SC But it's steady at 3.5 and has been now
for about 2 and a half minutes.
CAPCOM Copy. Hey 15, this is Houston, we'd like
to run that hatch integrity check to about 5 minutes total
because of what we suspect was the problem before and if it
passes at that point we'll press on per the flight plan for
following the normal steps and you can plan, if we have time
for it, we're looking for a jet at 179 30 at the present time,
over.
SC Roger, 179 30 and we'll give you a call

SC at the 5 minute point.

CAPCOM Thank you.

PAO At the present time, the crew has vented the tunnel to a pressure differential of 3 and a half pounds and then resealed it, and we're going to continue looking at it for a total of about 5 minutes to see if it continues to hold its pressure, to hold the pressure differential. Scott reported after the first 2, 2 and a half minutes that it was holding well and we'll continue to look at it for another minute or so before deciding with certainty that we have a good hatch seal.

SC Okay, Houston, there's 5 minutes at 3.5 and it looks solid.

CAPCOM Roger Dave, let's press on with a nominal timeline.

SC Roger.

SC And Houston, are you happy with 3.5 or would you like to bring it down a little more.

CAPCOM Roger Dave, we're happy with this hatch integrity and let's open the tunnel vent and bleed down towards 4.0 for the nominal set up. And I guess it's on the decal there.

SC Rog, no the decal says go for 10 minutes and then tunnel vent.

CAPCOM Roger, I guess that means after hatch integrity, which means beginning now.

SC Rog, step 7 and it's in work.

PAO With that test we're satisfied that we do have a good seal on the hatch and we're going to proceed now with jettison and separation. The LM jettison is scheduled to occur at 179 hours 30 minutes and the separation maneuver by the command module will be at 179 35, or 5 minutes after the jettison.

END OF TAPE

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CAPCOM 15, Houston, your suit integrity check looks good as far as we can tell down here.

SC Well, we had it for about 5 seconds there and then the O2 flow went back up so we'll hang on here and see if it comes back down.

CAPCOM Rog.

SC Okay, Houston. We got a good pressure integrity check. We're ready to press on.

CAPCOM Roger, we agree. And 15, we're still aiming for 179 30 for jet and be advised, of course this means we're going to have to retarget P30 to 179 35 and other than that all attitudes will be the same, although of course, since you'll be local vertical, your inertial attitudes for the burn will be slightly different than what you've seen.

SC Okay, understand and your Delta-P is off scale high now.

CAPCOM Roger, and you're 14 minutes past that time.

SC Houston, 15.

CAPCOM Go, go ahead, 15.

SC Rog, understand the retargeting on P30, you want to target that for 179 plus 30 plus 00, and the same Delta V's as before?

CAPCOM Negative, Al, it's going to be 179 plus 35 plus 00 for the sep burn.

SC Sorry about that. I meant 179 plus 35, 3 zeros jet, huh.

CAPCOM That's affirm.

SC Okay. Houston 15.

CAPCOM Go. 15, go ahead.

SC Roger, we're ready to turn the sequence arm on.

CAPCOM Roger, you're go for turning them on.

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

CAPCOM 15, you're go for pyro arm.

SC Roger.

CAPCOM And 15, we need direct RCS on please.

SC Okay, directs are on.

CAPCOM And 15, 3 minutes to jet and we're wait - we're watching for pyro arm.

SC Okay, we're preceeding through the prejet checklist at this time, and we'll get right to you.

PAO This is Apollo Control. We're now about 2 and a half minutes away from the scheduled time for jettisoning the LM. At the time of jettison, the spacecraft will be in an attitude with the service module SPS engine

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PAO pointed towards the moon and the LM jettison will occur with the LM jettisoning away from the lunar surface. Following the jettison, the command module will perform a small retrograde separation maneuver to assure that there's no chance of recontacting the lunar module, and with separation coming at 179:30, the deorbit burn, the burn to impact the lunar module into the lunar surface will occur at 181 hours 4 minutes 19 seconds and we predict impact will be at 181 hours 29 minutes 23 seconds.

END OF TAPE

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CAPCOM Coming up now on 15 seconds to LM jettison.
CAPCOM And we confirm jettison.
SC And it's away clean, Houston.
CAPCOM Roger, copy, hope you let her go gently,
she was a nice one.
SC Oh, she was the best.
SC Houston, 15, question on the separation
maneuver. Do you want us to burn residuals in P41, or just
make 1 foot per second burn?
CAPCOM Roger, Terry, burn them at P41, please.
SC Rog.
CAPCOM You understand that burn residuals, right?
SC Yes, thank you. Just making sure.
PAO This separation maneuver will be performed
using the attitude control thrust, or the RCS system, and
will be 1 foot per second velocity change.
SC Houston, P41 says 7/10 forward - Yes, 7/10
forward, 7/10 up.
CAPCOM Roger, Dave.
SC And FORWARD takes us right back to the LM.
CAPCOM Stand by, Dave, we're looking into that.
SC Okay, we got about a minute and 15 seconds
or so.
CAPCOM Roger.
SC Average G is ON.
CAPCOM Ah, hold the burn, Dave.
SC Okay, we'll hold the burn.
CAPCOM 15, this is Houston. We'd like to have
visual reference relative to your position to the LM; we'd
like you behind the LM; we'll give you a burn attitude for
5 minutes from now.
SC Roger. Okay, I guess she's 150 feet dead
ahead.
CAPCOM Okay. Copy, Dave, thanks.
PAO Spacecraft Communicator, Bob Parker, double-
checked the attitude of the position of the lunar module
relative to the command module. And while we were getting
that double check, we delayed the separation maneuver for
5 minutes. And we're, at this point, waiting for the Flight
Dynamics Officer to recompute the burn attitude. And we'll
be performing that separation maneuver in about 3 to 4
minutes from now.
CAPCOM And, Dave, can you verify: were you behind
in local, vertical, or body attitude coordinate?
SC Well, give us a little while to figure that
one out.
CAPCOM Roger, are you behind in the orbit, or are
you just - is it just sitting there in front of you as you
look at it?

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SC It's sitting in front of us when we sit there and look at it.

SC Bob, we're almost directly radially inward from the LM right now.

CAPCOM Copy that.

SC Houston, our attitude is 150 degrees relative to the local horizontal.

CAPCOM Say that again, please Dave.

SC Rog, our attitude according to verb 83 down there is 150 degrees relative to the local horizontal. Which means we're, I guess, fairly close to local horizontal, at least within 30 degrees.

CAPCOM Stand by, guys, confusion still reigns, I think.

SC Roger, understand.

END OF TAPE

CAPCOM 15, do you have an ordeal ball going at the moment.

SC Sure do and it's on the DSKY you can see it right down there.

CAPCOM Thank you. Roger, Dave we would like you to do a VFR burn which means go - maneuver to a trailing position and fire one foot per second retrograde. Understand.

SC That sounds like a good burn. Rog we'll do that.

PAO This is Apollo control. The separation maneuver which - -

SC Houston, 15. This ought to make for some interesting discussion, but I guess what you want us to do is point at him and burn the aft to one foot per second. Is that correct?

CAPCOM Roger, Dave. That's a way to keep an eye on him.

SC Well, we're having a hard time doing that because he's right in the sun right now. But Houston I think at this attitude of one foot per second aft will give us sufficient clearance. Don't you?

CAPCOM As long as you're trailing him, Dave I guess right now we can't give you any sound advice down here.

SC Okay, well if we burn one foot per second on the local horizontal which we are almost on right now I think that will put us in a orbit which we - remains clear from him.

SC Okay, Houston as far as trailing goes right now as we look over the ground we're leaving him.

CAPCOM Rog that's our -

SC (Garble) horizontal in front of him.

CAPCOM Rog we need you behind him, Dave. We were gradually coming to that conclusion that was the only way you could have him in the sun. We need you behind him and then a firing of retrograde.

SC Yes, that's going to take an awful lot. Because we're a far ways out now. And we'll have to maneuver quite a ways to get behind him. It'll take quite a while and a little bit of gas.

CAPCOM Roger, Dave, understand that. Stand by.

CAPCOM Okay, Dave how about 2 foot per second posigrade as long as you're in front of him. Understand 2 foot per second posigrade.

SC Okay, so that'll be out minus X DELTA-V for 2 feet per second at out present attitude. Right.

CAPCOM Rog, that affirm, Dave.

SC Okay, we're all in the same frequency. We'll do that.

PAO We show the separation maneuver in progress at this time.

SC Okay, Houston. We put in 2 feet per second aft. And that was done just at local horizontal.

CAPCOM Roger, copy. Thank you.

PAO The timing of the separation maneuver is not critical and it won't effect the events with the lunar module. The deorbit burn and the subsequent impact of the lunar module. We took some additional time to assure that the crew aboard the command module had good visibility of the lunar module at the time they performed the separation. And they completed the maneuver using the attitude control thrusters changing their velocity 2 feet per second to assure they got adequate separation from the lunar module.

SC Houston, appreciate that. Thank you and we'll call you back.

PAO Capcom has just advised Dave Scott that we're going to proceed on with the power down as soon as possible to allow the crew to get some much needed rest.

CAPCOM 15, Houston. You got a moment for this update.

SC Just a minute, Bob.

SC Okay, Bob what changes do you got for us.

CAPCOM These will start out in the flight plan, here and after LM jet we'd like you to proceed with the activities that run on the original flight plan from 177 30 through 17801 for that last entry that we will be doing will be the line that says X-ray on the very top of that next page. After that - during that though we will delete at 17753 the line that says mapping camera laser experiment covers open talk back barberpole and off center. It's the second line in the block at the bottom. You got that.

SC Okay, understand. We'll delete that particular line mapping camera laser experiment off and we'll do all the activities up to - through 178 there the mass spec X-ray on.

CAPCOM Roger, and at the - on that same page beginning at 17820 to 17830 we will scratch that particular that whole block of items and going along with that at 17839 it says DAC on we will also scratch that. Over.

SC Roger, understand. We will scratch the activities from 17820 to 17830 and at 17839 we'll scratch DAC on above the activity there at 17831. Guess we'll do that, huh.

CAPCOM Roger. 17831 that mass spec multiple low discriminator high ion source on will be done 30 minutes 30 minutes after the mass spec. Experiment on ion source to stand by which is over there at 17801. Other words we need a 30 minute delay between the top item on the left hand column and the top item on the right hand column.

SC Okay, we understand.

CAPCOM Okay, we'll delete the pan camera activities over on 179 hours. There's one at - 15 if you read, there's one item at 17916 and another item at 17921 that pertain to the pan camera. You will delete both of those.

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SC Okay, understand, delete the pan cameras at
17918 and 17921.

CAPCOM Roger, copy and when your ready to sleep. I
guess you can start with the systems checklist pre-sleep check-
list at 17931, there.

SC Okay, thank you, Bob.

CAPCOM And you noticed we didn't delete the eat period.

SC Thank you.

END OF TAPE

SC Thank you.

CAPCOM And Jim, do you guys want a TEI 58 pad?

SC Okay, we'll take one.

CAPCOM Okay, have you got the pad out?

SC No, stand by.

CAPCOM Give me a call. Okay Jim, understand you have the pad. SPSG&N 36363 plus 061 plus 093 192 13 33 30. Plus 27 997 plus 06 095 minus 009 80 181 112 015. Rest the pad NA. Ullage 4 Jet 12 seconds. Over.

SC Understand it's TEI 84 SPS G&N 36363 plus 061 plus 093 192 13 33 30 plus 27 997 plus 06 095 minus 009 80 181 112 015, 4 jet for 12 seconds.

CAPCOM Roger Jim, except it's TEI 58.

SC Roger, that's 58.

SLAYTON Okay Jim, and while we got you, this is Deke; I'd like to have you and Dave at least take a second here before you go to sleep so you can really power down for the night. You guys need it. It's up to Al whether he wants one or not.

SC Okay, thank you, Deke.

SLAYTON Rog.

CAPCOM 15 Houston, we have a correction to that update, if you'd get the Flight Plan back out please.

SC Okay, go ahead.

CAPCOM Roger, at item 178 30 on the mass spec, the discriminator value there should be low. Copy?

SC Rog, understand, discriminator low.

CAPCOM Right.

CAPCOM Apollo 15, Houston. You're about one minute till LOS, sleep tight.

SC Right Deke, good night.

PAO This is Apollo Control, we've had loss of signal now. Again to go back over and sort some of the activities on that revolution. We successfully completed the LM jettison and that occurred at 179:30 after reverifying that the tunnel was maintaining the proper delta pressure . . . pressure differential and that we had a good tight Command Module hatch seal. Now we had planned to do the separation maneuver performed in the Command Module using the reaction control systems thrusters at 179 hours 35 minutes and just before the maneuver was to be performed, Dave Scott gave us a call indicating that he wasn't quite sure that the attitude that we had given would be in the proper direction to avoid recontact. AT that point Flight Director, Glynn Lunney told the Capcom to call off the burn while we sorted everything out, made sure that there was no confusion and after redoing the position of the Lunar

PAO Module, double checking that with the crew, the relative position of the LM with respect to the Command Module and providing them an attitude which could be a burn giving them at the same time a view of the LM and keeping the sun out of their eyes. We performed the maneuver about 10 minutes late to about 14 minutes late at 179 hours 49 minutes. The timing on this burn is not critical for separation, thus there is no concern about delaying it to make sure that everyone agreed that we were in the proper attitude and that the maneuver was in such a way that the crew would be able to see the LM and also to keep the sun out the line of sight. The LM impact is scheduled now to occur at 181 hours 29 minutes 23 seconds, and this will be about 25 minutes after the deorbit burn which will be performed on commands from the ground at 181 hours 4 minutes 19 seconds. The one revolution delay in performing the jettison will effect of course, the LM impact time. This time that we have just given you is approximately one revolution later than the Flight Plan time, however, by the time we've completed the sleep period tonight and back in activities tomorrow, we should . . . we would expect to see no change to the Flight Plan for such events as the transearth ejection and sub-satellite deploy and this sort of thing. We would expect that the delay in performing the jettison tonight would have no effect on these downstream Flight Plan activities. The principle concern at the present time is to get Jim Irwin and Dave Scott to bed at the end of a very long day. The Flight Activities Officer reported that he felt they could probably begin their sleep period, in fact may already be asleep by the time we reacquire the spacecraft on its next frontside pass. Virtually all of the activities requiring their assistance has been completed. The other activities aboard the Command Module can easily be handled by Al Worden and Dave Scott mentioned that they were going to be getting a bite to eat and we would hope that they would either have begun their sleep period by the time we reacquire or will begin the rest period shortly after we reacquire on the 53rd revolution. At 180 hours 13 minutes, this is Apollo Control, Houston.

END OF TAPE

PAO This is Apollo Control at 180 hours 52 minutes. And we're now 2 minutes from reacquire in the spacecraft. We would hope that Jim Irwin and Dave Scott either have begun their rest period or will shortly after we reacquire the spacecraft. And on this revolution, the major activities will be the Lunar Module deorbit burn, and LM impact. The deorbit burn is scheduled to occur at 181 hours 4 minutes 19 seconds with impact on the lunar surface about 25 minutes later at 181 hours 29 minutes 23 seconds. The impact coordinates are 26.12 degrees north and 1.06 degrees east. Let's correct that to say 26 degrees 12 minutes north and 1 degree 6 minutes east, rather than hundredths of degrees. So that would be 26 degrees 12 minutes north, 1 degree 6 minutes east impact coordinates for the Lunar Module ascent stage. The LM at the present time is in an orbit 64.3 nautical miles by 52.2. And at the time the deorbit burn is performed we estimate that the Command Module will be 8 miles behind and about 2 and a quarter miles above the LM. We should have acquisition of signal on the Command Module in about 1 or 2 seconds. And our network controller, INCO report that we have acquisition of signal. INCO reports that the radio contact we have is with the Lunar Module, we're still waiting to get radio lock on with the Command Module in it's 53rd revolution of the moon now. The guidance officer just a minute or so ago radioed the command to the LM guidance system which starts the proper computer program in process and with the deorbit burn, which will occur about 8 minutes 50 seconds from now, correction 6 minutes 12 seconds from now at 181 hours 4 minutes and 19 seconds.

CAPCOM Apollo 15, this is Houston, standing by in the blind.

PAO INCO says we do have radio signals now from the Command Module.

CAPCOM Apollo 15, this is Houston, standing by in the blind. Over.

CAPCOM Apollo 15, Houston. Calling in the blind and standing by. Over.

CAPCOM Apollo 15, Houston. Calling in the blind, standing by. Over.

PAO We're coming up now on 20 seconds until the beginning of the LM deorbit burn. It will be a 201 foot per second burn, using the 4 reaction control system thrusters on the LM ascent stage. LM guidance and control officers both report telemetry data indicates the LM is burning. And we should have impact at 181 hours 29 minutes 23 seconds. We do have lock on with the Command Module, however, the signal strength is not strong enough at the present time for

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PAO us to hear any response from the crew.
Apparently they're not in the attitude with the high gain
antenna yet to give us a good enough signal strength for
voice communications. The guidance officer says that the
burns is progressing normally with the LM ascent stage and
again those predicted impact coordinates are 26 degrees
12 minutes north, 1 degree - -

END OF TAPE

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PAO impact coordinates are 26 degrees 12 minutes north, 1 degree 6 minutes east. The guidance officer says we've had shut down now. And the LM guidance system appears to have shut the burn off right on time. Guidance says the residual was .08 which indicates that the burn was almost precisely as planned. And at the conclusion of that burn the ascent stage has a weight of 5 315 pounds currently the altitude is 61.4 nautical miles and we'll be able to watch that altitude as it drops off to nothing at impact.

CAPCOM Apollo 15, Houston, in the blind, over.

CAPCOM Apollo 15, Houston in the blind, over.

PAO Falcon's altitude at the present time is 53.1 nautical miles and at impact the LM ascent stage will have a velocity of 5 560 feet per second. The flight path angle will be minus 3.2 degrees or 3.2 degrees pitched down from horizontal very shallow angle of impact. We're now about 17 minutes 50 seconds away from LM impact. Inco reports that signal strength is coming up on the CSM antenna indicating that we're getting the antenna to high gain antenna around in a position where we should be able to get voice communications with the crew aboard Endeavour.

SC Houston, 15.

CAPCOM Go ahead, 15.

SC Okay, we're just about getting bedded down, here Bob. I wanted to check and clarify one thing with you before we did.

CAPCOM Please do.

SC Okay, the flight plan updates that you gave to Jim a little while earlier included mass spec experiment on and switching with the discriminator multiplier. Now as of yesterday we had decided not to use the mass spec because boom deploy problems. Has somebody decided that we now should deploy the boom.

CAPCOM Rog, my understanding is that we didn't want to do it before the plane change because we might have to jettison it and now that we've got the plane change of accomplished we'll run it and if you have to jettison before TEI we'll do that. Over.

SC Okay, I understand. I guess I didn't understand that yesterday, and we'll go ahead and deploy it and get the mass spec going now.

CAPCOM Roger, Al. And one more thing we would like to make sure tonight that Jim is on the EKG for the evening.

SC That's affirm. Jim will stay on the biomed tonight.

CAPCOM Rog. And one more thing Al, we would to verify high gain antenna angles are pitch 25 yaw 185.

SC Right, that's what their set on now, Bob.

CAPCOM Okay, we had a long while picking you up. I

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CAPCOM guess we were a little worried, there.
SC No, we just got our signals crossed in here. And we had some different numbers on there before. So I got them. We're fixed up now.
CAPCOM Okay, and we'll be expecting you to be in VHF bistatic later on, right.
SC I guess if you want you can go ahead and do that.
CAPCOM Yes, please, Al.
SC Okay.
CAPCOM Okay, one last little check is optics power is on. We'd like it off eventually. I expect you haven't gotten that far, yet, Al.
SC That affirm, we'll get it.
CAPCOM Okay, and the line is you call us, we won't call you.
SC Okay, we'll call you. Thank you, Bob goodnight.
CAPCOM Goodnight.
PAO We're coming up now on 10 minutes until LM impact. And we currently show Falcon to be at a altitude of 31.5 nautical miles.
CAPCOM 15, Houston. Over.
SC Famous last words, go ahead.
CAPCOM Yes, how's that for broken promises. Hey OSO just came out of the woodwork and he's worried because he doesn't have X-ray and gamma rays and all those on yet either. I'd say he probably - just hasn't done any of that block, right.
SC Yes, hey Bob we're still trying to get cleaned up in here and get suits put away and all that sort of stuff. We'll get with it as soon as we can, but it's awfully cramped quarters and there's an awful lot of stuff to move around.
CAPCOM Rog, we were afraid you'd get use to the luxury of all that space.
SC I kind of liked it here by myself.
CAPCOM This time I'll keep my promise.
SC Okay.
PAO This is Apollo control. We're nearing 6 minutes away, now from LM impact. In the MSC news center briefing room, Dr. David W. Strangway will be available to provide background information and answer questions on the LM impact. And we'll have displays of the seismometer tracings that we're receiving here in mission control from the Apollo 15 and Apollo 14 science experiment packages - passive seismic experiments. At the present time we show Falcon to be 17.4 nautical miles above the lunar surface. Falcon is now 3 minutes from LM impact. We show its altitude 9.3 nautical miles. 2 minutes now from LM impact, Falcons altitude is 6.1 nautical miles. 1 minute prior to impact, Falcons altitude now is 3 nautical miles. 5 seconds to impact

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PAO and we've had LOS LM, loss of signal from the LM. Our science room reports we're getting seismic tracings now from the ALSEP the Apollo 15 site.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 CST2153 GET181:20 546/1

PAO This is Apollo Control. The actual
time of LM impact as computed from the time at which our displays
on the LM went static and we lost radio communication from
the vehicle was 181 hours 29 minutes 37 seconds.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 181:52 CDT 22:25 MC547/1

PAO This is Apollo Control at 182 hours 7 minutes. We said goodnight to the crew aboard Apollo 15 about 45 minutes ago. At the time Al Worden reported that they had a good bit of cleaning up to do, and getting things shipshape before they would be able to actually begin their rest periods. However, we do not plan to call the spacecraft again, if there is any communications, the crew will initiate a call to Mission Control. The Flight Dynamics Officer is continuing to refine the impact time for LM ascent stage. At the present time our best estimate is that impact occurred 181 hours 29 minutes and 34 to 36 seconds, and we'll get that impact time more precise as the remote sites have a chance to refine the data and determine precisely when we lost radio contact. We've now had loss of signal with the Command Module Endeavour. Spacecraft is on its 53rd revolution and we'll be reacquiring in about 45 minutes as the spacecraft comes back around to the front side of the moon on its 54th revolution of the moon. At 182 hours 8 minutes, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control. We are now about a minutes away from reestablishing radio contact with Apollo 15. The spacecraft now in it's 54th revolution of the moon. We do not expect to have any communications with the crew. We said goodnight to them at 181 hours 18 minutes, or about an hour and a half ago, and at that time, Al Worden said they still had a fair amount of cleaning up to do and getting sample containers stowed and the command module cabin cleaned up and ready for sleep. We told them that we would not call them. If they had anything for us, that they could give us a call. And, I recommended that they get to sleep as soon as possible. We do have biomedical telemetry on Jim Irwin, and that will probably be our best indication as to whether or not they are sleeping when we reacquire. INCO says we have reestablished radio contact with the spacecraft. And, the ALSEP support room here in the Control Center reported that we got seismic signals registered on all three of the active stations - the passive seismometers at Apollo - at the Apollo 12 site, the Apollo 14 site, and the Apollo 15 site from the LM impact. While we are in radio contact with the command module, we'll keep the lines up although we do not expect any voice communications for the duration of the sleep period.

SC Houston, 15.

CAPCOM 15 go ahead.

SC Is it time to get up yet, Bob?

CAPCOM Rog. We've got about 15 updates here for you if you want to get ready and send them.

SC Thought we'd give you a crew status report in the onboard readouts before we called it a night. I just wanted to check and make sure we got everything turned on for you.

CAPCOM Roger. We'll put (garble) - -

SC We got the mass spec out. Okay, Bob, we got the mass spec out and I think we've cleaned up everything else for you for tonight and I'll give you the readings here and then we'll call it a night.

CAPCOM Rog. We're listening and I hope everybody else down here will be getting with me so we can give it to you at the end if anybody wants anything. Go ahead.

SC Okay. The PRDs, 25023, 23174, 08029.

CAPCOM Copy.

SC My readouts: Batt C, 37; Batt A, 37.5; Batt D, 37.5. RCS quads are 63, 58, 60, 58.

CAPCOM Copy.

SC And, we are configured for the bistatic radar test.

CAPCOM Al, that should be bistatic VHF.

SC That's correct, Bob. The bistatic VHF radar. And, can you think of anything else that needs to be done?

CAPCOM Stand by, Al.

SC Okay.

CAPCOM Okay, three verifies for you, Al. Can you verify the camera raise out? The X-ray is ready and we need a verify on Jim for his EKG.

SC Okay, Houston, he's not hooked up yet but will be shortly and we'll verify the gamma ray in out and on in the X-ray.

CAPCOM Thank you.

CAPCOM And, Al, we're working a state vector uplink for you. Stand by a minute and we'll get a decision on that.

SC Okay, Rob, I guess we didn't have a gamma ray out so it's going out now.

CAPCOM Roger. That's a verify here.

SC And, the X-ray is on.

CAPCOM Thank you.

SC Okay, the X-ray is on. Seems like we had quite a few loose ends tonight.

CAPCOM And, Al, how about a verify on X-ray covers open.

SC Rog. That's verified. It's open.

CAPCOM Thank you. We're still discussing it back here.

SC Okay.

CAPCOM If you can give us P00 and ACCEPT, we'll have a load in about a minute. Stand by. Just ACCEPT.

SC Okay. Do you want P00?

CAPCOM Negative. ACCEPT only.

SC Okay. I'll leave it P20.

CAPCOM Okay, 15, you can have block back again. Good show. Thanks for the patience this evening and Karl will wake you when he wakes you and not a moment before. Good night.

SC Okay, that sounds like a winner, Bob. Good night.

CAPCOM Apollo 15, Houston.

SC Houston, 15. Go ahead.

CAPCOM Rog. This isn't Karl waking you up, but we don't show the mass spec experiment on and if the outgassing has been completed, we need the ion source on. Over.

SC Okay. We've got it on and it's been on for 45 minutes now. And, we now have multiplier low, and distributor low.

CAPCOM Beautiful, Al.

APOLLO 15 MISSION COMMENTARY 8/02/71 GET 182:52 CDT 23:26 548/3

SC Stand by, (garble) stand by.
CAPCOM Standing by.
SC Okay, Bob, we got it now.
CAPCOM Understand you got ACCEPT on - -
SC - - it should be in a minute.
CAPCOM Copy. Thank you.
SC Right.
CAPCOM We'll try again.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/3/71, 00:01 CDT, 183:27 GET, 549/1

PAO This is Apollo Control. We hadn't expected to hear from the crew aboard Endeavour on this the 54th revolution. However, we received a call from Al Worden about 30 minutes ago. Worden passed along a crew status report and mentioned that Jim Irwin was still in the process of getting set up for the sleep period and hadn't at that time hooked up the biomedical sensors that we'll be using to monitor his sleep this evening. We had Worden doublecheck some of the switching configurations for the orbital science experiments, particularly the gamma ray and X-ray spectrometer and also a bit later put in another call to Worden to doublecheck the switch settings for the mass spectrometer which we were not receiving data on and after a doublecheck Worden found a switch that was out of the proper configuration, switched it on and we are getting mass spectrometer data. The crew is about 3 hours late or a little more getting started on their rest period and we plan to let them get a good night's sleep. Gene Kranz who is the flight director coming on duty has asked his flight activities officer to plan for a day of orbital science based on a 10-hour rest period which would mean that the crew would be awakened at about 193 hours or perhaps a bit later. The flight dynamics officer has come up with a set of impact coordinates for the lunar module and they are as follows. 26.327 degrees north and 0.267 degrees east. The target coordinates were 26.2 degrees north and 1.1 degrees east. So the principal effect was to put the impact point down range approximately 9/10 of 1 degree and the flight dynamics officer is computing an actual miss distance in terms of kilometers and miles and we should have that a bit later. The impact was registered on the seismometers of all three ALSEP stations which are on the moon, the Apollo 12, 14 and 15 stations, and was, as we understand, weakest at the Apollo 12 station. Apollo 15 at the present time is in an orbit with an apocynthion of 67 nautical miles and a pericynthion of 52.8. We have about 34 minutes of acquisition time left before we lose radio contact with the spacecraft on it's 54th revolution. At 183 hours 31 minutes, this is Apollo Control, Houston.

PAO This is Apollo Control, 183 hours 51 minutes ground elapsed time. The crew still asleep. 14 minutes remaining until loss of signal with command module Endeavour. Toward the end of the 54th lunar revolution. Handover complete to Gene Kranz. White team of flight controllers, Black team headed by Glynn Lunney going off shift. A change of shift press conference with flight director Lunney will commence in about 5 minutes at 12:30 Houston time, in the small briefing room in the News Center. We'll leave the line up through the end of this revolution until loss of signal this revolution. In the off chance there might be additional

APOLLO 15 MISSION COMMENTARY, 8/3/71, 00:01 CDT, 183:27 GET, 549/2

PAO conversation with the crew but it seems
it's highly unlikely.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 0215 CDT 185:41 GET 550/1

PAO This is Apollo Control 185 hours 41 minutes ground elapse time in the mission of Apollo 15. Command service module Endeavour with all 3 crewman asleep at this time. Now midway through the 55th lunar revolution with 21 minutes left before loss of signal on this revolution. Apollo 15 is now 55.4 nautical miles above the lunar surface. in an orbit measuring 52.2 at pericyynthion and 66.7 at apocynthion. Current velocity 5369 feet per second. Spacecraft weighs 36 310 pounds. Earlier in this revolution the lunar module pilot's heart rate was down in the mid 50's, which was a fairly good indication that he was if not asleep almost asleep. Cabin is holding at 5.2 pounds per square inch, cabin temperature 69 degrees. Some 7 hours and 47 minutes remaining in the crew sleep period. Currently in operation are several of the orbital science experiments in the so called SIM Bay. Our scientific instrument module in the service module of Apollo 15 spacecraft. VHF bistatic radar experiment and the gamma ray experiment and the X-ray. At 185 hours 43 minutes this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 CDT 6:34 GET 189:59 551/1

PAO This is Apollo Control at 189 hours
59 minutes ground elapsed time. Just had LOSS of signal
with the command service module Endeavour on the 57th
revolution, nearing the end of the 57 th Lunar revolution.
Current altitude 52.4 nautical miles. Endeavour now in
a 66.9 nautical mile by 52.3 nautical miles Lunar Orbit.
Crew is still asleep at this time some 3 hours 29 minutes
remaining in the scheduled sleep period. During the last
front side pass, during revolution 57 the Lunar Module Pilot,
the only one of the three instrumented for Bio Medical
telemetry showed a mean heart rate of about 54 in the
mid range of 50. Cabin pressure was holding slightly over
5 pounds per square foot, per square inch that is. Temperature
67 degrees. At 190 hours and 1 minute ground elapsed time,
this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 GET19144 CDT0817 552/1

PAO This is Apollo Control at 191 hours 44 minutes. Apollo 15, Endeavour is nearing the end of the front side pass of the 58th lunar revolution. The crew is still asleep, 1 hour 45 minutes left in this rest period. We have changed shifts here in the control center. Flight director Gerry Griffin has relieved flight director Gene Kranz. Capcom now is astronaut Joe Allen. The Jack Schmitt news conference will begin in approximately 10 minutes in the main auditorium, at MSC. Let me correct that, it will be in the briefing room in the news center. The Jack Schmitt news conference on Lunar Surface Activities will be in the news center briefing room at 8:30 am central daylight time about 10 minutes from now. At 191 hours 45 minutes, this is Mission Control Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 GET19157 CDT0831 553/1

PAO This is Apollo Control at 191 hours
57 minutes. The news conference with astronaut Jack Schmitt
is beginning in the briefing room at the MSC News Center.
This conference is beginning now.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/3/71, 8:38CDT, 193:04GET, 554/1

PAO This is Apollo Control at 193 hours 04 minutes. We are in conversation with the crew. We had a call from Al Worden at 192 hours 45 minutes 22 seconds shortly after acquisition of signal on the 59th revolution. And the conversation has been fairly consistent since then. We've accumulated a fair amount of tape and we'll play that back for you now.

SC Houston, Apollo 15.
CAPCOM Good morning, Alfredo, this is Houston.
SC Good morning, Dr. Joe, how are you?
CAPCOM Couldn't be better, Al. How's it going?
SC Just fine Joe. You all talked out?
CAPCOM No, the crew is just getting ready to start, and pleased to have a chance to talk to you.

SC Same here.
CAPCOM I've got all kinds of things for you Al, when you - -

SC Very good Joe. Glad to be talking to you.
CAPCOM Okay, I've got all kinds of things for you, which I can start handing it up to you at your convenience pretty much. We're going to change the flight plan around a little bit. Primarily lifting out things because of our getting a somewhat later start than normal. And a couple of other minor modifications. I also have a lot of news to read to you and some other good things you might be interested in. Over.

SC Okay, Joe. Let's take a couple of minutes here to get some pens and the flight plan out and - and in about 5 or 10 minutes or so; I'll have the guys put the headsets on and we'll all listen to the news.

CAPCOM Al, out of curiosity, is everybody awake up there?

SC Yeah man.
CAPCOM Good morning, Dave.
SC Hey Joe, we sure are. We're just in the middle of breakfast.

SC Hello, Joe. How are you?
CAPCOM Well, I'm fine Deon; how are you today?

SC Morning Joe.
SC Oh, we're in great shape. Hey you sure did a fine job for us down there, Joe. Jim and I'd like to really thank you. That was a superfine job of taking care of everything for us.

CAPCOM I think the superfine job is the two of you; that was just most remarkable. Everybody down here is still floating so high, they're having a hard time getting down to all that data you gave us. And you'll be interested to know that - that we have sitting in front of us, a preliminary report from each EVA of the geology of the area that I would say is more complete than our 90-day preliminary reports which were issued on some of our other landings. It's just

APOLLO 15 MISSION COMMENTARY, 8/3/71, 8:38CDT, 193:04GET, 554/2

CAPCOM most exciting.

SC Well, it's because you've got the real professional back room there. Those - those guys really know how to put - put it together. Especially with the way they were coming up with the new ideas, while we were on the surface. That was really neat.

CAPCOM And Dave, I do have to ask you one question. Is there a three unit segment of these core stems some place in that command module?

SC Joe, we wouldn't lose sight of that for all the tea in China. That's number 1 priority.

CAPCOM Yes sir.

SC Oh, as a matter of fact, Joe, we made a good thorough search of the LM before we let it go. We went from top to bottom to make sure we got everything, and I'm sure we got everything we brought up off the surface, and I'm pretty sure we did fairly well cleaning up the surface.

CAPCOM Okay, Dave. Good news; good news. Al, if you're ready, I'll start hitting you with a few things we're interested in knowing from you right away and then when we get those, I'll give you the general plan for the day and I think, in some cases, we'll want to just talk you through some of the changes while you're making your front-side pass. There's no need to feed up all the data in detail to you at the beginning here. My first question, we need from you a configuration of panel 230 particularly, in fact only really the mass spec switches, could you call out the settings for the mass spec, experiment switch, ion source switch, multiplier switch and discriminator switch, please.

SC Okay, Joe, I'm right there. Experiment is up and on; ion source is center, the - -

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 GET 193:09 CDT 9:43 555/1

SC Okay, Joe, I'll bite there. Experiment is up and on, IM Source is centered, the discriminator is low and the multiplier is low.

CAPCOM Okay, thank you. That's what we guessed. And Al, I guess the first thing we want - we're going to want you to do today is to start to get ready to go plus X forward, P20 option 5. We're going to want you to retract the Mass Spec Boom and close the X-ray and Alpha particle cover.

SC Okay Joe. We'll do all that. How about putting that on a time basis for me so I can write it in the Flight Plan.

CAPCOM Okay, real fine. You can start that right now. Just put it in at 192 52, I guess. And also, right after that, lift fuel cell purge H2O dump and LIO canister change.

SC Okay, Joe. Understand. You want us to go ahead in to plus X P20 SIM Bay attitude and pull in the Mass Spec and the Gamma Ray Booms and I guess turn off the Mass - turn the Mass Spec to stand by.

CAPCOM Al - let me - hit you with that last statement again. We want you to retract the Mass Spectrometer Boom, but not the Gamma Ray, and close the Xray and Alpha Particle covers. Retract Mass Spec Boom and close 2 covers. Over.

SC Okay, understand. You want us to pull in to retract the Mass Spec Boom and close the Xray Alpha covers, then do the fuel cell purge, the water dump and canister change.

CAPCOM That's affirm.

SC Okay, Joe. I'll get that worked.

CAPCOM And 1 more item, you can start to charge Bat B at your convenience.

SC Okay.

CAPCOM Okay, and looking downstream here. As soon as you get turned around, and these other good things done. We're going to ask you to open the Xray and Alpha Particle covers and for REV 60, the agenda calls for an eat period for you. And Gamma Ray Xray and Alpha particle data being taken during that time. Sounds like you've got your eat period pretty well out of the way.

SC Yeah, that's right Joe.

SC Houston, 15.

CAPCOM Go ahead, Al.

SC Okay, Joe. While we're manuevered here to a Plus X forward. How about reading some news to us.

CAPCOM Okay. Sure will. Let me begin with just a note on that water dump. It'll take about 15 minutes to run and they're interested in your dumping it to close to 10 percent onboard reading. Over.

APOLLO 15 MISSION COMMENTARY 8/3/71 GET 193:09 CDT 9:43 555/2

SC Rog. Understand. Probably the same as we've been doing before. We dump down to 10 percent but not below 10 percent.

CAPCOM That's correct and I've got several things to read to you here. I have the official morning Gold Bugle Zeitung report and - that comes from 2 rows behind me here. And I've also got a telegram for you Jim. And I have some history - a little bit of history that's been researched for you by the people at Honeysuckle concerning a small problem with a leak on the Endeavour about 200 years ago. And I'll start with whatever you'd like to hear first.

SC Okay, Joe. Go ahead.

CAPCOM Okay, let me just start with the mornings news. The weather report in Houston-Galveston area calls for showers and thunder showers through Wednesday. Today's temperatures will be in the lower 70s and upper 80s. The United States will support Communist China's admission to the United Nations this fall, Secretary of State, William Rogers announced. The U.S. will also fight against expelling the Nationalist Chinese Government on Taiwan. U.S. Steel, the industry pacesetter -

END OF TAPE

CAPCOM against expelling the nationalist Chinese government on Taiwan. U.S. Steel. The industry pace setter announced a price hike averaging 8 percent on virtually all of the products and several other companies followed suit as an aftermath of a new 3 year labor contract. Trainmen won pay increases of nearly a dollar and a half an hour spread over a 42 months in a nation-wide contract settlement and called off their crippling strike against ten railroads. The union yielded on the railroad's demands for some work rule changes yet to be worked out. Among those viewing Apollo 15 activities, Monday, in the CR, was artist Robert McCall, designer of the commemorative stamp for Apollo 15. And just -- just an edited note, he was also making sketches of the scenes down here as he saw them and he would turn them out almost as fast as the photographer would take pictures. That was most interesting. Returning to the sporting news, Don Wilson pitched a 2-hitter and Jesus Alou drove home the winning run and then made a game saving catch as the Houston Astros downed the Chicago Cubs 2 to 1. Apparently, rain is slowing up the oilers preparations for the Giants. The oilers/Giant exhibition game is scheduled for Monday night in the Astrodome. And I've got Monday's baseball score board which I'll run through quickly for you baseball fans. In the American League, Boston 7, Baltimore 4, New York 7, Cleveland 0, Oakland 2, Kansas City 1, Chicago 7, Minnesota 5, Detroit 11, Washington 7, California 3, Milwaukee 1. Read back.

SC Disregard, Joe, copied all zeroes.
CAPCOM Rog. Okay. In the National League, Philadelphia 4, Atlanta 0, Cincinnati 4, New York 2, St. Louis 3, San Diego 1, and Los Angeles 5, San Francisco 4. And Lee Trevino entered another thousand bill to his bank roll, Monday, by taking first place with the number -- with a 7 under par 65 in the Columbus Invitational pro Am Jack Nicklaus, Arnie Palmer teamed last weekend to close in on Trevino in professional golf's money winning race though, Nicklaus and Palmer won twenty thousand dollars each when they won the National Team Championship at -- I guess Leganer, Pennsylvania. Trevino leads for the year was a total of nearly two hundred thousand dollars. And I'll go over now to Jim, a special telegram for you which reads essentially Mother, Dad, and your brother are very proud of you. We were thinking of our trip together on top of Mount Whitney and we're with you in spirit on the Moon. Love, Mother, Dad, and your crew. And I might add, that there -- an occasional piece of mail for all of you that is starting to come in to the Manned Spacecraft Center here. In fact, I think a truck pulled up yesterday to deliver some of the first. I'm going to go on if you're still listening to read some history that was sent to us by the Honeysuckle

APOLLO 15 MISSION COMMENTARY 8/3/71 GET 193:14 CDT 09:48 556/2

CAPCOM people. And the subject is "A Leak on the Endeavour at 62 hundred GET". Following the above incident and the wonder from the Apollo 15 crew, whether Captain Cook's Endeavour had ever sprung a leak. (garble) Honeysuckle Tracking Station has searched the records and come up with the following incident which may be of interest. Information has been extracted from an old newspaper article and an entry in Captain Cook's log book. It was 11 P.M. on June 11, 1770, a clear moonlit night, when his Majesty's ship, Endeavour under the command of Captain James Cook, sailed serenely under fully full sail within the waters of the Great Barrier Reef off Australia's northeast coast. Then disaster struck. The ship had got upon the edge of reef of coral rocks which lay to the northwest of having come in places run the ship 3 or 4 fathoms and in others about as many feet. And I'm quoting James Cook's diary here. But about --

END OF TAPE

CAPCOM having come in places, run the ship 3 or 4 phathoms and in others about as many feet, and I'm quoting James Cook's diary here. But about a 100 feet from her starboard side, she laying with her head to the northeast was 7, 8, and 10 phathoms, unquote. With a grind and a roar, the Endeavour rose in the bow and came down hard into water tasks broke their lifing and lay in a tangle with the rigging on the deck. the captain clad only in drawers, which I guess is a constant wear garment, rushed on deck. He summoned all hands to the pumps and ordered all unnecessary stores to be thrown overboard. Such items as iron, and stone ballast from deep in the hole, casks, hoops, stays, oil jars, decayed stores and then six cannons which fired 4 point shot. Probably 1 cannon to fire long, 1 cannon to fire short and 2 to fire for effect. These infact are the cannons discovered in 1969 off the coast of northeastern Australia by a team from the Philadelphia academy of science, and after restoration one each was presented by the Australian, to, by the Australian government to the U.S. British and to New Zealand. The remaining three cannons are in Australia. The original Endeavour was finally freed from the reef by means of oakum and wool wrapped in a sail being sunk under the ship and plugged into the hole in hope that it would be sucked into the leak and would close the leak. The experiment was entirely successful and I quote again from Cook's diary, "In about a quarter of an hour to our great surprise, the ship was pumped dry and upon letting the pumps stand she was found to make very little water." unquote. Subsequently the Endeavour arrived at the Australian mainland, the landing place is now called Cooktown by the way, and after two months the damage had been repaired and the ship returned to England, and that's the end of your history lesson for today. Over.

SC That's quite an analogy isn't it.

CAPCOM Quite an analogy Dave. Certainly is. Back to reality Al, I have a CSM consummables up date for you if your interested in that. And let's see, the other item on my desk, well, I'll get to it a little later. I'll be standing by for your go ahead on the CSM consummable update.

SC Okay, stand by Joe. (garble)

SC I'm ready to copy the consummables Joe.

CAPCOM Okay Alfred-0. GET 191 plus 25. RCS total 47. Quad A 50 47 46 47. H2 tank 1 56 53 42. 02 tank 1 64 67 54.

SC 191 25. RCS total 47. Quad A 50 47 46 47. H2 is 56 43 42. 02 is 64 67 54.

CAPCOM Copy Al, and I'll be right back.

SC Okay, Joe.

CAPCOM Endeavour, this is Houston again.

SC Go ahead Houston.

CAPCOM Okay Al, let me lay some more words on you

APOLLO 15 MISSION COMMENTARY 8/3/71 GET19320 CDT0953 557/2

CAPCOM concerning your flight plan when you're,
when you're ready to talk about that.

SC Roger Joe, go ahead.

CAPCOM Okay, you'll be in the configuration
plus X forward and we'll be taking gamma ray x-ray and Alpha
particle data, data during rev 60. We want you to do at
193 plus 45, a P52 option 3 and we're going to add a map and
pan camera pass sometime during rev 60 and I'll be coming at
you with the necessary data for that. Also -

SC Roger Joe, understand.

CAPCOM Okay, Al. Now I guess a word about
bio-med configuration today. In order to get some very inter-
esting base line data, medical data on you Al, and Jim for your
EVA coming up later, we're requesting that the two of you give
us that bio-med data today. I think Dave you were scheduled
for it but I guess we prefer Jim on the line with Al.

END OF TAPE

CAPCOM coming up later. We're requesting that the two of you give us that biomed data today. I think, Dave, you were scheduled for it, but I guess we prefer Jim on the line with Al to get baseline data for later. Now, Al, let me run through and get some blocks here, of the next rev as we see them and the approximate activities and then I'll come up with specific data concerning those revs later on, perhaps actually during the revs. On rev 61, we're going to have the UV --

SC Roger that.

CAPCOM Okay. On rev 61 will be UV photography of the lunar mare; we're coming up on, I guess an hour of light flash experiments and it's pretty much dealer's choice between Dave and Jim, who - which ever one of you would like to do that. Rev 62 will be a crew exercise period, for science photos and science visuals, and we'll be taking the mapping camera and laser altimeter data during rev 62; and it will end with terminator photos. On rev 63, more mapping camera, laser altimeter and a burst of the pan camera, UV photos and terminator photos again. Rev 64 will be eat period, boom photos, LiOH canister change, and that brings us up to about 204 hours and it'll be time to go to bed again. Over.

SC Okay, Joe. Understand in the flight plan that the object is going to be to get us back to the printed flight plan as much as possible.

CAPCOM That's exactly right, Al. And you'll be coming on to it kind of as the day progresses because the rest is - we're just going to pick up a few quick items that we've missed over the past 2 hours and mainly just lift out other sections as I understand it, but you'll be back on the flight plan shortly.

SC Okay, Joe. Fine. Thank you.

CAPCOM Rog. And --

SC And, Joe, let me request that Jim be --

CAPCOM Go ahead, Dave.

SC I'd like to say that I'd like to have Jim without his sensors on today. That 3 - 4 days in a row is pretty tough with those things on. I think probably, if we get him tonight, you could probably get your data, don't you think?

CAPCOM Stand - stand by Dave and I'll - let me double check.

SC Say, as a matter of fact, Joe, why don't you give Jim and Al both a break today on the sensors, and I'll stick mine on because I've had them off since we got back yesterday, and then if you want us have some particular data gathering for you, why don't we take a look at that starting tonight, huh?

CAPCOM Okay, Dave. That sounds good.

SC Okay. And concerning the light flash things, Jim and I both saw light flashes while we were on the surface

APOLLO 15 MISSION COMMENTARY, 8/3/71, 9:59CDT, 193:26GET, 558/2

SC as a matter of fact.
CAPCOM Okay, copy that Dave. That's remarkable.
CAPCOM Good ship Endeavour, this is Houston.
SC Go ahead, Houston.
CAPCOM Roger. On our down link data, we see indications of high gain antenna yaw fluctuations. Wonder if you could glance over at your onboard indication and see if you see it there as well. And, also we're standing by for crew status reports when you're ready to give it.
SC No we - we see no oscillations up here, Joe.
CAPCOM Okay, thank you.
CAPCOM Al, this is Houston with a TEI 62 pad when you're ready for that. We also have a question. How did the mass spec boom retraction go? And we've got a switch setting for your mass spec when you're ready.
SC Okay. Jim will be ready to copy TEI pads here in a minute, and mass spec boom retracted without a hitch this time, Joe, so I didn't get the time on it, but it was very close to the nominal time and apparently it didn't hang up this time.
CAPCOM Okay, fine Al. Thank you. We'd like the - I guess the mass spec placed on stand by, please.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/3/71 GET19332 CDT1005 559/1

CAPCOM Okay, fine Al. Thank you. We'd like the
i guess the mass spec placed on standby, please, and that's
the experiment switch.

SC Okay mass spec on standby. Yeah, that's veri-
fied on standby, Joe.

CAPCOM Thank you.

SC And Joe, I'm ready to copy that TPI pad.

CAPCOM Okay, Jim, good morning. We need ACCEPT and
we're going to uplink a new state vector to you and here
comes the TPI 62 pad, SPS G&N 36310 plus 061 plus 092 200
10 3464 plus 29 284 plus 01903 minus 00435 180 106 006 the
rest is NA. No comment. Ullage 4 jet 12 seconds. Over.

SC Okay, readback on TPI 62. SPS G&N 36310 plus
061 plus 092 200 10 3464 plus 29 284 plus 01903 minus 00435
180 106 006 four zips, 12 seconds.

CAPCOM Okay, Jim, readback correct and how are you
doing this morning?

SC Fine Joe, we had a good nights sleep.

CAPCOM Super.

SC Okay Joe, I've got a clear status report for
you.

CAPCOM Go ahead.

SC Okay long as 9 hours sleep in one
period there, Joe, to begin with and the PRD's are 25024
08031 and 23175.

CAPCOM Okay, Al, copy that and assume there was no
medication.

SC That's affirmative.

CAPCOM Okay, thanks Dave.

CAPCOM Endeavour you can go back to block. You have
a new state vector and we're standing by to watch your water
dump.

SC Okay, Joe crank out the water dump. Want to
watch one for a change, huh?

CAPCOM Rog, lay it on.

CAPCOM Hello Endeavour, this is Houston with a map camera photo
pad when you are ready.

SC Stand by one, please, Joe.

CAPCOM Roger.

PAO This is Apollo Control at 193 hours 34 minutes.
We're back live on air ground now. The briefing the
subsattellite which was scheduled for 10 a.m. today at the
news center briefing room has been postponed until approxi-
mately 10:30 a.m. this morning. That briefing will be
carried on the release line while Endeavour is behind the
moon.

SC Houston, 15. Go ahead with your mapping and
pan camera photo patch up.

CAPCOM Okay, Al. And I forgot to tell you when you
are dumping water you can also go ahead with the urine dump.

APOLLO 15 MISSION COMMENTARY, 8/3/71 GET19332 CDT1005 559/2

CAPCOM if you need to do that - I just forgot to
mention it. The map camera photo pads for rev -

SC That's okay, we're going it.

CAPCOM Yeah, for rev 60, key start 194 35 05, key stop,
195 34 50. Image motion setting at key start -

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 GET 193:77 CDT 10:10 560/1

CAPCOM Steady. At T start barber pole plus 4. AT 195 plus 20 plus 00 barber pole. And a couple of notes on this. Be sure to retract the gamma ray boom prior to the start of the camera pass. And be sure to go to 5 degrees Dead Band in P20 -- I'm sorry, Al. That's 5 tenths of a degree Dead Band in P20 prior to camera pass. And you want to extend the camera and start the laser altimeter per the system's checklist page S1-38, over.

SC Roger, Joe. Understand. Mapping camera photo pad P start 194 35 05. P stop 195 34 50. Now for the image motion, do you want a T start barber pole part 4 and at 195 20 00, do you want that increased to barber pole? And notes, retract the gamma ray before taking the pictures, go to half degrees dead band and extend the mapping camera and start the laser altimeter as per system's checklist S1-38.

CAPCOM Sounds good, Al. Thank you.

CAPCOM Endeavour, this is Houston with the new 02 heater configuration for you.

SC Okay, Houston. Go ahead.

CAPCOM Rog, Al. We want 02 heater in tank 3 to auto and tanks 1 and 2 off, over.

SC Understand, Joe. You want 02 heater in tank 3 auto and the other 2 off.

CAPCOM That's right, Al. And we want you to proceed with your 02 fuel cell purge listed at 193 plus 58 in the flight plan.

SC Roger, Joe. We'll get that in work, here now.

CAPCOM Al, this is Houston. You can terminate the dump now and turn the Alpha particle experiment off, please.

CAPCOM Endeavour, Houston. Requesting auto in the high gain. And trips you may have to delay, the P52, we've called out to you and coming up shortly. Till about 194 plus 20 to make sure most of the water is out of the way, over.

SC Roger, Joe. I'll just go take a look here and see if I can pick up (garble) count. Go ahead and do the P52.

CAPCOM Okay, Al. And you got the call about the Alpha particle counter, I hope.

SC Right, roger. We got it turned off.

CAPCOM Thank you, sir.

SC Houston, 15.

CAPCOM Go ahead.

SC Okay, Joe. I got the gyro torquing angles up and I'll torque them out in a minute.

CAPCOM Stand by.

CAPCOM Al, we've noted the termination of your fuel cell three purge. At your convenience, open the x-ray and the Alpha partical experiment covers, please, and turn the

APOLLO 15 MISSION COMMENTARY 8/3/71 GET 193:77 CDT 10:10 560/2

CAPCOM Alpha particle back on, over.

SC Okay, Joe. We'll be about another 2 or 3 minutes finishing up all the dumps and then we'll do that.

CAPCOM Okay. Fine. We do want you to wait until all the dumps are completed and then open the doors and turn Alpha particle on at your convenience really.

SC Roger.

CAPCOM Good ship, Endeavour, this is Houston. We'll see you on the other side.

SC Okay, Joe.

PAO This is Apollo Control at 193 hours 56 minutes. We've had loss of signal on this revolution. Endeavour and its crew performing orbital science throughout the day. We passed up an update to the flight plan for today. Crew reporting 9 hours of sleep last night and no medication. The briefing on the subsatellite will begin momentarily in the MSC News Center Briefing Room and we'll reacquire Endeavour again at 194 hours 41 minutes about 30 seconds on its 60th revolution. At 193 hours 57 minutes, this is Mission Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/3/71 GET19440 CDT1115 561/1

PAO This is Apollo Control at 194 hours 40 minutes.
We're less than a minute away from acquisition of signal on
Endeavour's 60th lunar revolution. We'll stand by for air
ground during this pass.

CAPCOM Hello Endeavour. This is Houston. Hello
Endeavour. This is Houston.

SC Hello Houston, Endeavour. Loud and clear.

CAPCOM Roger Al. I wanted to tell you that except
for a couple of minor changes that you will shortly be back
on the nominal flight plan. I do have a pan camera photo
pad to be copied into your flight plan at 195 plus 00 when
you are ready.

SC Okay, Joe. Go ahead.

CAPCOM All righty. At 195 plus 00 pan camera mode
standby. Power ON, stereo exposure normal. At 195 04 13.
Pan camera mode OPERATE. At 195 14 30 -

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/3/71 GET194:45 CDT1120 562/1

CAPCOM operate at 195 14 30, pan camera mode standby. Pan camera mode MONO at 195 18 23, pan cam self test to SELF TEST. The talkback should be barberpole for 30 seconds and then gray. And after the talkback is gray pan camera self test to HEATER, at about 195 plus 21, pan camera power OFF on a cue from MSFN. At 195 plus 34 plus 50 laser altimeter OFF retrack map camera and close map camera cover per steps 7 and 8, page S1-39 in your checklist. Over.

SC Okay Houston, understand. And I'll go through the whole thing here for you. At 195 pan camera mode standby, POWER ON, stereo and exposure normal. At 195 04 13 mode to OPERATE at 195 14 30 mode standby and stereo to MONO at 195 18 23, self test and barberpole for 30 seconds and then self test to heaters at 195 2100, pan camera power to OFF on your cue at 195 34 50 laser altimeter OFF retrack the mapping camera and close the covers per steps in checklist S1-39.

CAPCOM Okay. Al, right on and could you verify for us, please that the Alpha particle spectrometer has been turned on and that the x-ray and Alpha particle covers are open. Over.

SC Okay, Joe. The covers are open. X-ray is ON and Alpha particle coming up now.

CAPCOM Okay, thank you.

CAPCOM And Endeavour we need narrowbeam on the high gain, please.

SC Got it.

CAPCOM Okay Al, thank you.

SC Rog. Joe. Houston, 15.

CAPCOM Go ahead Al.

SC Joe looking ahead a little bit in the flight plan I see we've got gegenshein coming up on this rev and I guess my question is do you want me to change the film in the camera now. In other words have we missed any picture taking with the Hicon that maybe you want to pick up with that mag before I offload that mag.

CAPCOM Al I'll will have an answer for you in just a minute on that. In the meantime could you reverify that the covers on the X-ray and Alpha particle are open, and we're getting some problems on that and I guess the best thing to do would be just go to your checklist page 1-33 and do that cover open a couple of steps which is listed number one cover -

SC Okay, Joe. You're right. I don't know where we got our wires crossed but the covers were closed and they are now open.

CAPCOM Okay no problem. Good. Al on your question about the gegenshein experiment -

END OF TAPE

CAPCOM Al, on your question on the Gegendchein Experiment, we want you to go ahead and change the mag to Victor just per the Flight Plan.

SC Okay, Joe. Thank you.

CAPCOM Hello, Al. This is Houston.

SC Go ahead, Houston. This is Al.

CAPCOM Roger, Babe. Requesting give us a gain step on the Gamma Experiment up 3 clicks, please. And we're also wondering what mag you've taken off the Nikon to put mag Victor on. There is some confusion, in our minds, I guess we thought Victor was already on there. Over.

SC Negative. Mag U was on there before and I've just taken it off.

CAPCOM Okay, thank you, Al. That helps us. And once again, the gain step on the Gamma, up 3 clicks. And we're showing that now.

SC You've already got it.

CAPCOM Thank you.

CAPCOM Endeavour, this is Houston. Requesting AUTO on the high gain, please.

SC AUTO it is.

CAPCOM Endeavour, mark 15 seconds to Pan camera OFF. ON - Pan camera ON, sorry.

SC Rog. Got you, Joe.

CAPCOM Pan camera ON.

SC It's on.

PAO This is Apollo Control at 195 hours 6 minutes. Endeavours present orbit 67 by 51.9 nautical miles. The orbital period 1 hour 58 minutes 38 seconds and we're showing a weight of 36 310 pounds. Present altitude for Endeavour is 65.6 nautical miles, velocity 5315 feet per second.

CAPCOM Pan camera to standby in 30 seconds.

SC Rog, Joe. Thank you.

CAPCOM Pan camera to standby.

SC Yep.

CAPCOM We copy, and thank you, Al. And I've got a UV photo pad, a big 1 liner when you're ready to copy that.

SC Okay, Joe. Go ahead.

CAPCOM Rog. This is for your pad located at 196 plus 50. And it is P start 1965619.

SC Understand, Joe. UV photo pad start 1965619.

CAPCOM Right on, Al. Thank you.

CAPCOM Endeavour, 30 seconds to self test.

CAPCOM Al, I gave a bad call. I was 30 seconds premature on that. Stand by.

SC Okay. Looks like you'll get 2 self tests, Joe.

CAPCOM Al, that's no problem. We'll take both of them, and I'll cue you for the next one.

SC Okay. I'll give you a whole series of them if you want them.

CAPCOM Negative, Al. 30 seconds to Self Test.

SC Roger.

CAPCOM Mark. Self Test.

SC Rog.

SC Houston, 15. pan camera is in heater mode now.

CAPCOM Thank you, Al.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 GET19519 CDT1154 564/1

SC Houston, 15. Pan camera is in heater mode now.

CAPCOM Thank you, Al.

CAPCOM Okay, Al, and on the map camera, image motion to barber pole please.

SC Rog.

PAO This is Apollo Control at 195 hours 28 minutes. The flight controllers who are monitoring the data from the Sim Bay, report that it looks good, and the status check indicates that all systems on Endeavour are normal. All temperatures within limits, displays and controls instrumentation, power distribution and sequencing communications, guidance and control, crew systems, propulsion and power, all parameters normal. We have 25 and a half minutes remaining in this front side 60th revolution.

CAPCOM Hello Endeavour, this is Houston.

SC Houston, Endeavour go ahead.

CAPCOM Roger, Al. I've got what they tell me is the last change to your flight plan to put you back on the nominal.

SC Okay Joe, stand by.

CAPCOM Okay, no hurry.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 GET19531 CDT1206 565/1

SC Okay Houston, 15. Go ahead with the flight plan update.

CAPCOM Okay, Al. The first change is at 195 plus 36 in your flight plan, and it is gamma ray boom deploy, talk back barber pole, for about 2 minutes and 40 seconds, then gray and then to off. Center position. Over.

SC Roger Joe. Understand. At 195 36 00, gamma ray being boom deploy, talk back barber pole about 2 minutes 40 seconds, then gray and switch off.

CAPCOM Okay Al. That's good and the next 2 items are delete over at 196 plus 31. And that is delete -

SC Okay, go ahead.

CAPCOM Delete map camera laser experiment covers, etc, and delete map cam track, etc. and at 196 plus 37 delete laser altimeter on. Over.

SC Roger, understand. At 196 30, delete the 2 lines dealing with the mapping camera and at 196 37 delete the laser altimeter function.

CAPCOM Okay Al, and your now back on your flight plan except for the additional couple of pan camera bursts and a map camera pass, that you already have copied down. And while I've got you on the line here, I'd like for you to think back yesterday and I've got a question to ask concerning your suit integrity check. We're trying to go through this and reconstruct exactly what had happened. and I guess what we need is a comment about your third suit integrity check, and that one was the one you did just after the first LM jett had been scrubbed and you went around the backside and did a suit integrity check, and we're wondering if you can recall any of the details of that check for us? Over.

SC Okay, understand you're concerned about the second suit integrity check we did. The third one was okay. The suits were - held integrity fine and we had an O2 flow of about .6 to .7. So I guess you're talking about the second one.

CAPCOM Dave, we're talking about the one you did before the last one. What ever number you call that.

SC Yea, Dick, that was the one we recycled quickly onboard up here, and it was because we had one of the gloves that wasn't fastened on exactly right.

CAPCOM Roger, Al. Map camera and laser off, please.

SC Okay, map camera and laser off, and did you understand the comment on the suit integrity check?

CAPCOM Fine Al, thank you. That help's us a lot.

SC Okay.

APOLLO 15 MISSION COMMENTARY 8/3/71 GET19531 CDT1206 565/2

PAO This is Apollo Control at 195 hours
36 minutes. That last bit of information was for the environ-
mental control systems officer on shift now, who wanted to
reconstruct the events of the suit integrity checks yester-
day. The, a bad glove on that bad glove connector prevented
a good check on the one they were discussing. They sense
that time did get a good suit integrity check.

CAPCOM And camera power off when convenient
please.

SC Okay, it's off.

CAPCOM Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/3/71 GET19538 CDT12:13 566/1

CAPCOM Endeavour this is Houston. You are coming up on LOS in about 2 minutes and everything is looking just as slick as glass.

SC Okay, Joe and we're just sitting here in attitude all set to dim the lights and do the gegenshein.

CAPCOM Okay, Al sounds like fun. Enjoy the backside and see you in a few minutes and if there is anything you need from us down here just give us a call.

SC Certainly, Joe.

CAPCOM Knew you would.

PAO This is Apollo Control at 195 hours 54 minutes. We've had loss of signal on Endeavour. The photography of the lunar surface and orbital science being conducted throughout this revolution. Data from the science experiments coming in good. We'll acquire endeavour on it's 61st revolution, at 196 hours 39 minutes 20 seconds. AT 195 hours, 55 minutes this is Mission Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/8/71 GET 196:38 CDT 13:12 567/1

PAO This is Apollo Control at 196 hours 39 minutes.
Apollo 15 will be within range of Earth Tracking Stations in
about 15 to 20 seconds. We'll stand by for first conversations.

SC Houston, 15.

CAPCOM Endeavour, Houston.

SC Hello Houston, Endeavour here.

CAPCOM Roger, Al. Copy. And I've got a TEI 64 pad
when you're ready.

SC Okay, just a minute.

SC Okay, go ahead with the pad.

CAPCOM Rog, Alfredo. SPS G&N for TEI 64 36310 plus
061 plus

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/3/71 GET196:43 CDT13:17 568/1

CAPCOM G&N for TEI 64 36310 plus 061 plus 092 204 08 1162 plus 30 110 minus 00196 plus 00488 180 102 002. All the rest NA. Ullage 4 jet, 12 second. Over.

SC Roger, Joe. Understand TEI 64 SPS G&N 36310 plus 061 plus 092 204 08 1162 plus 30 110 minus 00196 plus 00488 180 102 002. The rest is NA. 4 jet, 12 seconds.

CAPCOM Readback is correct, Al. Thank you.

PAO This is Apollo Control at 196 hours 55 minutes.. In addition to the scientific instrument module experiments being performed on this pass the crew will perform the light flash experiment again and we'll be taking some science visuals. These are observations of selected points on the Moon, visual observations, of topographic features, in effect orbital geology by observation. And the backup crew commander astronaut Dick Gordon has joined Joe Allen at the CAPCOM console.

CAPCOM Endeavour, Houston.

SC Alright, Houston, Endeavour go ahead.

CAPCOM Al, could you give us the mass spec discriminator switch to low, please.

SC Mass spec discriminator to low.

CAPCOM Okay, thank you and did you get a volunteer for a eyeflash experiment?

SC Yes, I think we have a volunteer for you.

CAPCOM Okay.

SC The volunteer is checking in here, Joe.

CAPCOM Okay, Jim. A quick word on it. Everything per the flight plan we are going to ask you to go ahead and give us your description real time on the downlink and your choice if you want to push to talk or go on to VOX, and then when you go around the corner you can put it on the DSE like you did before, in high bit rate. And, Al, we've got a one time special good deal for you in the meantime. We're coming up - you're going to be flying over the LM impact point shortly where your trusty Falcon augered into the Moon and we're going to ask for a short pan camera burst there. We'll come up with that photo pad to you in a minute. In the meantime, at your convenience, could you go to FREE load NOUN 79 to .5 DEADBAND and then go on back, please.

SC Okay, we'll do that Joe. Standby. That ought to be a good one.

CAPCOM And Endeavour you will be interested to know that the impact of Falcon was picked up on three beautiful seismometers on the Moon, a really remarkable record.

SC Which ones were they, Joe?

CAPCOM Apparently they were the ones from Apollos 12,

-

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 GET 196:58 CDT 13:32 569/1

CAPCOM 3 beautiful seismometers on the Moon.
A really remarkably record.

SC Which one were they, Joe?

CAPCOM Apparently, they were the ones from Apollos 12, Apollos 14, and Apollos 15. We haven't had reports from other seismometers yet.

SC That's very interesting.

SC Tell us, Joe, did they get the LM impact close to where they wanted it?

CAPCOM Roger. It went in to within about a degree and in fact, as you know, it doesn't -- the exact point isn't all that important. It -- it went in just about where we wanted it, though. And Al, as soon as you have NOUN 79 and you give us ACCEPT, we'll give you state vector, over.

SC Okay, Joe. You have it.

CAPCOM Rog, we see it. Thank you.

SC Okay, Joe, I'm ready to start the experiment.

CAPCOM Okay, Jim, we're copying.

CAPCOM Endeavour, auto on high gain, please.

SC Rog. Auto.

CAPCOM Al, this is Houston. You can go back in the block. We still need a half a degree dead band and you can delete two lines in your flight plan one at 19704 and one at 19709, both the PAN camera lies there. Delete them, over.

SC Rog, Joe, Understand. Delete the pan camera lines at 19704 and 19709.

CAPCOM Roger. You can block the computer but we need a half a degree dead band.

SC Roger, Joe. I've loaded it a couple of times. Let me check it again.

SC Okay, Joe. I've got half a degree and having a hard time counting.

CAPCOM Thank you, Al. I'm not doing any better.

SC Rog.

SC Joe, are you still there?

CAPCOM Go ahead.

S As long the line here waits for a flash, I might comment that Dave and I both observed a flashing while we're at -- on the surface. While we were in the bunks down there, we observed the flashes with oh, about the same frequency we observed in orbit. One night in about a 5.10 minute period there, while I was awake I grabbed a little experiment by just turning over in the bunk. It seemed like the frequency was much less when I was lying on my stomach as opposed to lie on my back. It's just a note of interest.

CAPCOM Okay, Jim. That's a most interesting comment and as you know, with about 10 minutes to go during the experiment today, we'll ask for you to turn over and be

APOLLO 15 MISSION COMMENTARY 8/3/71 GET 196:58 CDT 13:32 569/2

CAPCOM oriented with your face away from the Moon and we might very well get the same sort of information this time. Al, I've got a photo pad for you to copy when you're ready and then, Jim, you can just go ahead and switch to VOX mode if you don't want to push to talk while you transmit to us. Your choice on that, though.

SC Okay, no problem.

SC Okay, Joe. Go to the pad.

CAPCOM Roger. And camera pad at 197 plus 16 plus 22. And you're to go to operate first step 5 in your checklist page S1-38. And at 197 plus 18 plus 22, the pan camera, just stand by.

CAPCOM And at 197 plus 40, you can delete the P52 scheduled band, over.

SC Roger, Joe. Understand. You want the pan camera down. To operate at 197 16 22 as per the system's checklist 1-38 and to stand by at 197 18 22 and delete P52 at 197 44 - or - 40.

CAPCOM Right on, Al. Thank you. And Jim, we're standing by to copy your comments.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/3/71, 13:46CDT, 197:10GET, 570/1

SC -- 40.
CAPCOM Right on, Al. Thank you. And Jim, we're standing by to copy your comment.
SC Roger, Joe.
CAPCOM And, Jim, this is Houston. We'd like for you to transmit your description as well as the mark call, please.
SC Understand.
SC mark and it was at the left eye; 8 o'clock, and it was a streak and it seemed to be moving from 8 o'clock to maybe the 1 o'clock position, oh about - there was about 20 degrees of arc out to a position periphery at 8 o'clock into midway on our sphere of reference here. An intensity of three at mark, I just had a flash at 1 o'clock moving to the center - the center of - moving toward the 12 o'clock position. It was intensity 3 and that last one was the right eye. Mark a flash at the 12 o'clock intensity 4.
SC That was right down the plux-X axis, Joe.
SC But I just got half of it.
CAPCOM Roger, Jim, copy.
SC Mark a flash at the 8 o'clock, left eye periphery, intensity 2.
CAPCOM Al, pan camera stereo switch to stereo, please.
SC Okay, stereo it is.
SC And pan camera, to stand by.
CAPCOM Okay, Al. Thank you. That might be a super picture.
SC Gee I hope so, Joe.
PAO Jim Irwin is facing the lunar surface during the first part of this experiment.
CAPCOM Jim, this is Houston. How are the eye flashes coming?
SC Still waiting, Joe.
CAPCOM Okay.
SC Mark a first ray of flash at 10 o'clock, left eye about three quarters of the way out to the periphery, intensity 5; Mark a streak at 1 o'clock moving - -

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 GET 197:27 CDT 14:02 571/1

SC Mark. A streak at 1 o'clock moving from the bottom to the top of our sphere. Moving definitely vertically up beginning at 1 o'clock about 3/4 of the way up.

CAPCOM Jim, this is Houston. And we're still listening to you. In the meantime, I've got a map camera pad to give to Al when he's ready. Over.

SC Okay, he'll be with you shortly.

SC Yeah, hold on Joe. We're going over the Harbinger Mountains and right over the Aristarchus Plateau right now. And Dave and I are looking like mad and taking pictures.

CAPCOM Fine, Alfredo. When you get back to me, I'll give you this other pad. It's got to be within the next 15 minutes though.

SC Okay, Joe. No problem about that.

SC Mark. Flash at, seems like it was in both eyes about the 7 o'clock position, 1/4 of the way out the periphery, intensity 5.

SC Houston, 15. Ready to copy the pad.

CAPCOM Roger, Al. At 198 plus 25. Go to narrow deadband in P20 verb 22 Noun 79 plus 00050 open cover and extend Map camera per steps 3 and 4 in your checklist. 198 plus 31, map camera image motion ON. 198 plus 32 plus 10. Map camera ON. Image motion increase barber pole plus 4 steps. Laser Altimeter ON. 199 plus 19, image motion increase talk back barber pole. 199 plus 31 plus 56. Map camera OFF. Laser altimeter OFF, wait 30 seconds then map camera ON. That should read Map camera ON to stand by, and then retract and close cover per steps 7 and 8 in the checklist. And that brings you to 199 plus 31 in your flight plan and you can delete the 3 lines at that point. The Map camera image motion ON. Map camera ON, Map camera image motion increase. Over.

SC Roger, Houston. Copy. At 19815, go narrow deadband at P20. Open mapping camera covers and extend the mapping camera. At 19831 plus 00, mapping camera ON. Oh, I'm sorry image motion ON, and 198 plus 32 plus 10, mapping camera ON, image motion to barber pole plus 4 and Laser Altimeter ON. At 199 1900 image motion to barber pole. At 199 3156 mapping camera OFF, Laser OFF, wait 30 seconds mapping camera to stand by. No, that's retract and close covers.

CAPCOM That's correct Al, and you can delete those 3 lines at 199 plus 3 -

END OF TAPE

SC Mapping camera to standby
SC Got it.
SC Retract and close covers.
CAPCOM That's correct Al and you can delete those three lines at 199 plus 30 and there is a note that goes with this. This particular pass will be taken with the gamma experiment and the mass spec experiment booms extended so don't worry about the fact they are out. One number you gave to me, the first one, should be 198 plus 25 go to narrow deadband. Over.
SC Roger. 190 25. That's what I had written, read it wrong.
CAPCOM Okay, thank you.
SC Okay Joe, during that conversation I saw two - both at 8 o'clock. First one was 3/4 of the way out, intensity 2. The last one was at intensity 3 about half way out, appeared to be at left eye.
CAPCOM Thank you Jim, copied.
SC Mark. Flash at center - intensity 2.
SC Mark. Flash left eye 9 o'clock on the periphery intensity 5.
CAPCOM Roger.
SC Joe how is the time going on my one hour?
CAPCOM Okay Jim. My sand dial shows about 15 minutes remaining. You'll be going around the corner LOS shortly. We don't have any more instructions for you on the experiment or in fact on anything else going on. We would like your present - a description of your present position in the spacecraft. And we'd like for you to remain in that position for the rest of the 15 minutes in the experiment. Over.
SC Okay understand you don't want me to turn over. I'm in the left couch and of course facing the plus plus x and just when we started that conversation I had a flash at 11 o'clock on the periphery at intensity 4 and then just at the end of your conversation I had a streak moving from the three o'clock to the nine o'clock, right to left. Right through the plus X position.
CAPCOM Okay, Jim copied that and that's correct just stay in your present position, and we'll see you on the other side.
SC Okay.
PAO This is Apollo Control, 197 hours, 52 minutes. We've had loss of signal on revolution number 61. Throughout this pass the orbital science experiments have been conducted. Al Worden did panoramic camera photography of the lunar module impact point and Jim Irwin has been conducting the light flash experiment throughout most of the front side pass and will continue it as the spacecraft goes around behind

APOLLO 15 MISSION COMMENTARY, 8/3/71 GET197:36 CDT14:10 572/2

PAO the moon. Our unofficial count of the flashes
he marked while we were in contact comes to an even dozen.
AT 197 hours, 53 minutes this is Mission Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 GET 198:36 CDT 15:10 MC573/1

PAO This is Apollo Control at 198 hours 37 minutes, we should be acquiring Endeavour shortly on its 62nd revolution of the moon. We'll stand by live during this pass.

CAPCOM Hello Endeavour, this is Houston requesting reac and narrow.

CAPCOM Okay Al, thank you very much. Sometime during this pass we are going to be requesting an ISA weight which you have in your Lunar Surface Checklist page 3-2 and we'll have a map camera and a pan camera pad to send up to you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 GET 198:41 CDT 15:15 574/1

CAPCOM camera and a pan camera pad to send up to you.

SC Okay, Joe. That all sounds very good.

CAPCOM Endeavour, this is Houston. We're showing your mapping camera not on at this time and are requesting it on. It may be just to reverify from your 198 plus 32 plus 10 on the flight plan. Over.

SC Rog, Joe.

PAO This is Apollo Control at 198 hours 52 minutes. There will be a change of shift briefing at the end of this shift. It will begin a few minutes after loss of signal on this revolution. Standby please. This is Apollo Control. That change of shift briefing should start in approximately an hour, approximately 4:30. We'll continue to stand by live in this pass. The crew busy with orbital science. We're showing cabin temperature in Endeavour 75 degrees farenheit, cabin pressure of 4.8 pounds per square inch. This is Apollo Control at 199 hours. The Flight Dynamics staff has computed the final update on the LM impact point. The coordinates are 26.362 degrees north latitude, and .253 degrees east longitude. The final aim point was 26.2 degrees north and 1.1 degrees east. The impact point represents about a 13 mile down track miss from the aim point. Impact time, final update on that was 181 hours 29 minutes 36.24 seconds.

CAPCOM Endeavour, this is Houston. We copy the gamma ray gainstep shield on, and Al, we have photo pad 3 to you when you're ready to copy. Over.

SC Okay, Joe, go ahead.

CAPCOM Okay, in your flight plan, at 199 20, you can strike PCM ABLE, unless your relativistic speed has managed to lengthen that cable I guess. At 199 25, you can strike the 3 lines CMC mode, VERB 22 and CMC mode. And then I have a pad for you at 200 plus 20 when you're ready.

SC Roger, go ahead with the pad at 200 20.

CAPCOM Okay, Al. At this time it's camera configuration for terminator photos that we missed a little earlier. And the lines should read CM4/EL/250/VHBW, IVL F5.6 at 1/125th infinity, 6 frames mag Romeo. Over.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 CST15:45 GET199:10 575/1

CAPCOM Mag romeo, over.

SC Rog, Joe, understand, terminator photo pad at 200 plus 20 is CM four slash EL slash 250 slash VHVW, and that's with the intervalometer IVL and f 5.6 1125 infinity 6 frames and mag R.

CAPCOM Read back's correct al and the next entry is at 200 plus 25 which is open the map camera covers and extend the camera per page S1-39 and at that time map camera image motion to on, and then coming up to the time 200 plus 27 plus 56 EL on and 200 plus 29 plus 36 EL off. At the time 200 plus 30 plus 36 map camera on image motion increase, talk back to barber pole, plus 4 steps, laser altimeter to on, and camera mode to stand by, power on, stereo exposure normal, over.

SC Roger Joe, at 200 plus 25 open mapping camera covers and extend the mapping camera turn the image motion on at 200 2756 EL on and at 2936 EL off at 3036 mapping camera on, image motion to barber pole plus 4 and laser on and then pan camera stand by power on stereo exposure normal.

CAPCOM That's correct Al, and continuing on through a few more steps here and I'll read them all and then stand by for your read back, 200 plus 33 plus 29 pan camera mode to operate. 200 plus 49 plus 32 pan camera to mono 200 plus 54 plus 27 pan camera stereo 200 plus 59 plus 22 pan camera mode stand by. pan camera power to off on MSFN Q. And moving right along, 201 plus 17 plus 00 pan camera image motion increase, I'm sorry Al, that was misread, that should be map camera image motion to increase, talk back barber pole 201 plus 28 plus 21 EL on 201 plus 30 plus 01 EL off 201 plus 30 plus 21 map camera off laser altimeter off, and the final one 201 plus 32 plus 00 retract camera and close covers per the page in your checklist, over.

SC Roger Joe, understand at 201 1700 mapping camera image motion increase to barber pole.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 19915 GET 1550 CDT 576/1

SC (garbled) 1700. Mapping camera image motion increased to barber pole at 201:28:21 EL ON; at 201:30:01 EL OFF; 201:32:00 OFF, no back to 30:01 after EL OFF, read map camera OFF, laser OFF, and at 201:32:00 retract and close two mapping camera covers.

CAPCOM Okay, Al, and read back to me 4 more lines beginning with 200 plus 33 plus 29. You didn't go back quite far enough and that one should read pan camera mode to operate and (garbled).

SC Okay roger, at, at 33, at 200:33:29 pan camera to operate; at 49:32 pan camera to mono; at 54:27 pan to stereo; at 59:22 pan to standby; power off MSFN cue.

CAPCOM Okay, Al, sounds real good, but double check for me EL line which I may have goofed; it's the 201plus 30 plus 21 map camera OFF, laser altimeter OFF.

SC Roger, Joe, understand, at 201:30:21 that's 20 seconds after EL OFF, we get the mapping camera off and the laser off.

CAPCOM Yes sir, that's affirm. And, I guess we're still waiting for an ISA wait; other than that, we're doing real fine.

SC Okay, Joe.

SC Houston, 15.

CAPCOM Go. Go ahead, Al, and we're waiting for a image motion talkback to barber pole.

SC Okay, Dave's going to get the ISA weight out for you and call you.

CAPCOM Okay. If he's able to weigh it right there, I'd like to know how he's going to do it; I assume he's got it written down though.

SC He's got it written down; he just has to get it out.

SC Houston, this is 15.

CAPCOM Go ahead, 15.

SC Yes, Joe, I have weight information on the ISA. The ISA total was 64 pounds, which includes bags 4 and 6, and 8 pounds return items. And the ISA, by itself without anything loaded in, was 8 pounds. Over.

CAPCOM Okay, Jim, copied that, sounds like there might be a stone or two in there.

SC Yeah, bags 4 and 6, for sure.

CAPCOM Thank you, Jim.

CAPCOM Apollo 15, we'd like camera ray shield ON please.

SC Roger, Dr. Parker, shield ON.

CAPCOM And, 15, time to start the terminator now.

SC Rog.

CAPCOM Mapping camera - stand by, please.

APOLLO 15 MISSION COMMENTARY 8/3/71 19915 GET 1550 CDT 576/2

SC Rog, standby.
CAPCOM Laser altimeter OFF please.
CAPCOM Apollo 15, Houston, if you have a chance,
we'd like to talk to Dave and Jim about this LCG connector
problem some time.
SC Okay, stand by.
CAPCOM And AUTO on high gain, please.
SC AUTO

END OF TAPE

SC Houston, 15. Go.
CAPCOM 15, 2 questions we'd like to ask, first one is specific and that is if you noticed anything about the connector between the LCG and the suit when you took it out in order to put the plugs in yesterday afternoon. Was it already out, was it loose, was it not locked or what. And secondly a generally question building up from this can you tell us anything, any insights you acquired in taking the suits off and looking at the connector or just in general about what this problem may have been caused by.

SC Well I guess our first indication was lack of a good integrity check, as a matter of fact, we couldn't get much more than about a pound a suit and at first - in thinking it over we thought the only thing it could be would be those connectors because that was the only semiopen port, even though it shouldn't be leaking. And everybody checked their helmet and gloves and they appeared to be locked so we broke open the helmet and gloves and Jim reached in through my zipper and pulled out the LCG connector and stuck in the plug. And then we rezipped - or I did Jim rezipped me and we tried another integrity check and it worked okay. I guess beyond that I don't have any information for it, other than the only possibility is that the LCG connector was leaking or that somebody's glove or helmet was leaking because the suits have been, as you know, very tight all the way through.

CAPCOM Roger. Did Jim notice when you - when Jim took out your connector, there to put the plug in. Could he notice it as being loose, unattached, or not locked locked. Did he have any - could he tell you that just reaching in with his fingers.

SC About this Jim, the lock lock was engaged on that water connector on Dave's suit.

CAPCOM Okay, copy and we understand that Dave's suit was the only one that did not pass the integrity check that first time around.

SC No, you can't isolate it. The whole suit circuit is the integrity check, it's spacecraft plus three suits. So there's no way to tell.

CAPCOM Roger, but on - what I mean is that you did not put - did you put plugs in Jim's suit too or just in Dave's suit.

SC No, only in one suit. But we did go through the operation of taking off helmets and gloves which also may have been the problem.

CAPCOM Roger, copy that.

SC In other words there may, even though we checked the lock locks on the helmets and gloves, why somebody could have had a cocked one and missed it. These -

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SC especially the surface equipment was - had an awful lot of lunar dust on it and it's sort of hard to work. We're going to get them cleaned up before the EVA, but after 3 runs down there - why the connectors were getting pretty tough to work even though we did lubricate them.

CAPCOM Roger, copy. I don't think we have anything else, Dave. We noticed you did seem to have some trouble getting a suit integrity check the second time around, also. Is that right?

SC Yes, there was a glove that wasn't locked.

CAPCOM Okay, guess I wasn't on the loop, thanks.

SC I think the suit cuicuit's tight. I think that it might have just been one of those things. Because the last one we ran was real good. The flow dropped down to like 6 or 7 tenths I guess and would have stayed there all day long. I think we've got a good suit loop, but I'm not worried about that at all. Just a matter of getting all the connectors cleaned up so they all work well. And assuring that everybody gets a good lock lock.

CAPCOM Roger, Dave. We agree too, it seems to us that sounds like it was just one of those situations we run a suit integrity check for.

SC Rog, that's exactly right.

END OF TAPE

PAO This is Apollo Control, the suit integrity check being discussed with Dave Scott was the one that was performed last night prior to jettisoning of the Lunar Module. This check is a routine check of the suit loop, generally performed by pumping the suit up to about 9 pounds per square inch of pressure or perhaps a little bit more and then monitoring the decay rate and also the oxygen flow rates to the suits. On, I believe it was about 2 occasions, Scott reported and we were able to monitor on the ground, a high flow rate indicating that a good pressure integrity was not being maintained. After making some adjustments to the suits and particularly after inserting some auxiliary plugs in the fittings which normally, while the suits are being worn in the Lunar Module or on the Lunar surface, would have water hose connections to the back packs, but which are connected to nothing when used in the Command Module. The plugs were inserted inside the suits and subsequent pressure integrity check showed the suits to be good. Throughout the day, we've been working on the problem here on the ground to attempt to understand what had happened and the conversation with Scott was to attempt to gain some additional information. As you heard both the ground analysis and Dave Scott's analysis is that we do have at the present time a good suit circuit good suit integrity checks and that the suits and suit circuits are maintaining pressure as they should and the implications from the conversations is, a most likely suspect some dirt in some of the fittings. In Mission Control at the present time we are completing a shift handover, Flight Direction Glynn Lunney and his team of Flight Controllers will be replacing Gerry Griffin and his team, the spacecraft communicator on this shift is Astronaut Bob Parker.

CAPCOM And 15, Houston. You are GO for LOS.

SC Thank you very much, Houston.

PAO We have about 30 seconds now until loss of radio contact with Endeavour, spacecraft completing its 62nd revolution of the moon and we'll be reacquiring in a little over 45 minutes. There will be a change of shift press briefing, probably about in 5 minutes in MSC news center, the participants in the briefing will be Flight Director Gerry Griffin and Spacecraft Communicator, Joe Allen. At 199 hours 51 minutes, this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 GET 200:35 CDT 16:09 579/1

PAO This is Apollo Control at 200 hours 35 minutes. And we're about 1 minute away from regaining radio contact with Apollo 15 spacecraft now in it's 63rd revolution of the moon. While the spacecraft has been behind the moon, flight director Glynn Lunney has completed a status review with the flight controllers. Everything appears to be progressing smoothly at this point. And the flight activity officer reports that we should be pretty much back on the normal flight plan by the scheduled time for the crew to begin their rest period tonight, which would be at 203 hours 40 minutes or a little over 3 hours from now. And leading up to that time we'll primarily be completing a configuration of experiments in the SIM Bay, getting the spacecraft squared away and ready for the sleep period. We should have acquisition, we do have acquisition of signal now, we'll stand by for a call to the crew.

CAPCOM Endeavour, this is Houston. Over.
SC Hello Houston, this is Endeavour.
CAPCOM Roger. We got the usual flight plan update, if you'll get a flight plan out and copy them in, please.
SC Okay, standby one.
CAPCOM Okay, and if someone could give us high gain antenna to auto, we'd appreciate it.
SC Go ahead with the update.
CAPCOM Okay, first one is the UV photo plan pad at 201 05 and the flight plan the T start will be 201 11 19. Over.
SC Understand. UV T start 201 11 19.
CAPCOM Roger. Next at 201 20 we will delete TCM cable.
SC Okay, got that.
CAPCOM Roger. At 202 30, discriminator low in that line on the mass specs.
SC Okay. Discriminator low at 202 30.
CAPCOM Roger. At 203 21 we will delete laser altimeter off.
SC Understand. Delete laser altimeter off at 203 21, and let's hold up on the rest for a minute.
CAPCOM And 15 30 seconds to pan camera mono.
SC Hey, go with the rest of the updates, Bob.
CAPCOM Okay, at 203 23 we will delete the mapping camera track retrack talkback barber pole 4 minutes grey then off center, that whole line.
SC Okay, that's deleted. Next?
CAPCOM We want pan camera mono please.
SC It's there.
CAPCOM Roger, sorry.

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CAPCOM Okay, 203 27 we'll delete mapping camera/
laser experiment covers closed talkback barber pole grey
then off center. Etc., etc. that whole line there. 203 27.

SC Okay, next?

CAPCOM Okay, now we have here a little test the guys
down here would like to run with the laser to see if we can
zap it a little bit and rejuvenate perhaps. First
step is back on 201 30, we will delete the laser altimeter
off and mapping cover/laser altimeter cover closed. At 201
plus 30. Over.

SC Are you making an update to the update?

CAPCOM Standby here, standby a minute.

SC Okay, I didn't exactly find that one.

CAPCOM Yeah, standby I got to check with OSO.
Okay, 15, we got clarification on that the laser altimeter
off is at 201 30, the mapping camera laser altimeter cover
closed is called out at 201 32. We want to delete both of
those.

SC Standby Bob. We're taking pictures; we'll
come back to you.

CAPCOM Yeah, give me a call.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 CST1723 GET200:53 580/1

CAPCOM And 30 seconds to pan camera stereo.

SC Okay Houston 15, go ahead with the updates if you've got them.

CAPCOM Okay Al, did you copy, what we're doing is, we're changing that update, deleting the laser altimeter off at 20130, and then we're also deleting at 20132, the call out to close the mapping camera laser altimeter cover, over.

SC Okay, I understand, 20130, you want the laser altimeter left on, and the mapping camera left out and the covers open.

CAPCOM That's affirm. Okay now after the mapping -

SC Is that what you want?

CAPCOM That's affirm. And now after the mapping camera is off at 20130, we want to cycle the laser switch off for 1 second then on for 15 seconds, off for 1 second on for 15 seconds, ectera, for 20 cycles, and after 20 cycles we will leave the laser altimeter on for MSFN analysis, over.

SC Okay understand, you want at 20130, you want to cycle the laser altimeter off for 1 second and on 15 seconds, for 20 seconds, for 20 cycles and then leave it turned on.

CAPCOM That's roger, and we'll get back to you at that point.

SC Okay.

CAPCOM And that's all we have for right now Al.

SC Roger.

CAPCOM And Al, 30 seconds to pan camera stand by power off. And 15, we verify the pan camera lense is stowed, when convenient, we'd like battery B charge, battery bravo charge terminated.

SC Understand, B terminated.

CAPCOM And Endeavour Houston, one more request please.

SC Go ahead Bob.

CAPCOM Rog, since we don't have the PCM cable, we'd like to, for these UV photos, to have you give us a mark each time you press the shutter button please, on the air to ground.

SC Okay, if you'd like.

SC Houston, 15.

CAPCOM Go ahead, go ahead 15.

SC Okay, Bob would you like me to hook up the PCM cable to it?

CAPCOM Well the word that I was given down here

CAPCOM was that you couldn't reach with the PCM cable.

SC No, we're taking the pictures out of window 5 and that's where the scientific instrument outlet is.

CAPCOM Stand by. 15, if you can do that, that's fine.

SC Okay, I'll tell you what Bob, I'll go ahead and hook up the PCM cable and you tell me if you're getting a signal down there after I start taking pictures.

CAPCOM Okay.

SC And the word you got on it was correct. It looks like window 5 is about the only window that can be used for the PCM cable.

CAPCOM Roger.

PAO The ultra-violet photography, which the crew is preparing to perform in about 2 minutes is done with the hasselblad electric camera, mounted on a special window bracket. The purpose of the experiment is to obtain ultra-violet photographs of the earth and the moon and these will be used in a study of planetary atmospheres. They will also be used for investigation of short wave length radiation from the lunar surface.

CAPCOM And Endeavour, we won't be able to see that PCM real time, but we'll just assume that it's coming down if you've got the PCM cable hooked up.

SC Okay, Bob, I've got it hooked up.

CAPCOM 30 seconds to UV photos.

SC Okay, thank you.

END OF TAPE.

APOLLO 15 MISSION COMMENTARY 8/3/71 GET 20111 CDT 1745 581/1

SC Houston, 15.
CAPCOM Go ahead, 15.
SC Okay, Bob when we took the shade out of window 5, window 5 still appeared very clean.
CAPCOM Copy.
CAPCOM And Endeavour, two questions if you've got a chance between now and terminator photo.
SC Say again on the terminator photos, Bob.
CAPCOM Rog, do you have time for a couple of questions between now and the start of the terminator photos.
SC Yes, sure go ahead.
CAPCOM Rog. First any comments on the mass spect boom retraction, you did a half hour ago.
SC No, no comments on it, and I guess we're back to the position we were in before that the thing is sort of half barber pole. And when I go back out with it, fiddle with it a little bit the barber pole goes full up and then comes back down about half way again.
CAPCOM Okay, we copy.
C And that's where it stands right now.
CAPCOM Okay, second question - -
SC I played with it for awhile and then got busy in other things. But I'll continue - I'll continue working on it.
CAPCOM Copy, Al. Second question, do you want me to continue giving the - give these real time marks on air to ground just before and after various camera passes.
SC Yes, I like the reminder, Bob.
CAPCOM Okay, 30 seconds - -
SC Don't expect an answer I'll probably be busy doing it.
CAPCOM Hopefully, 30 seconds a good time.
SC Rog.
SC And Houston, 15.
CAPCOM Go ahead.
CAPCOM 15, go ahead.
SC Okay for your info the mass spect took about a - oh maybe 7 or 8 cycles this time before it came all the way in. And the same operation as before.
CAPCOM Roger, copy. It took you 7 or 8 cycles to get it all the way in.
PAO Al Worden's last comments referred to the mass spectrometer boom. He reported that it required about 7 or 8 cycles to get the - of the switch to get the boom to retract fully from its extended position. That boom extends out about 24 feet from the service module. And we have previously noticed some problems in retracting the boom. It appears that these problems usually a slow or bulky retract occur when the retraction is attempted in darkness

PAO waiting for the suspicion that perhaps a cable is stiffening up and causing the thing to be bulky to retract. We don't appear to have the problem when it is retracted in full sunlight. This last retraction attempt was done at sunrise which would go along with the theory at that point would still be cold, would not have had a chance to warm up from direct exposure to the sun. The instrument itself is continuing to function very well, the mass spectrometer and we're getting very good data from it, the problem being in the boom mechanism that extends and retracts it. And insofar as possible we will attempt to do the retraction while the boom is in sunlight.

CAPCOM 30 seconds, the terminator photo start.
Terminator photo stop.

SC Rog, Bob.

CAPCOM Mapping camera off.

PAO This is Apollo control. The crew is now completed the photography of the terminator using the electric Hasselblad camera and also the mapping camera and the scientific instrument module bay. We're standing by now for them to begin a procedure which we hope will possibly solve the problem with the laser altimeter. About 35 or 40 minutes ago, we asked the crew to - -

CAPCOM And be advised we'd like an accurate 15 seconds on 1 second off. No more than 16 or 17 seconds on.

SC Rog, understand.

PAO What Al Worden is doing is cycling the switch on the laser on and then off. And it'll do this 20 times the hope is that in cycling the switch it will cause a particular circuit in the laser altimeter to fail. This circuit is used to discharge high voltage from some of the components and in discharging the voltage it's thought that perhaps we're introducing some noise into the altimeter which is in turn causing the intermittent flow of data from that particular instrument.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 20133 GET 1807 CDT MC582/1

PAO Al Worden has completed cycling the switch on the laser altimeter; and the Orbital Science Officer reports from the telemetry, it appears that the procedure did no good, that the laser altimeter is still not functioning properly.

CAPCOM All right, 15, roger, thank you, unfortunately, like everything else, the laser didn't do much good. We'd like now mapping camera to STANDBY, laser altimeter OFF, and then we'll do the retract and door close. Over.

SC Okay, Bob, we'll go mapping camera OFF and laser OFF.

CAPCOM We need mapping camera STANDBY, please.

SC Roger, STANDBY, and image motion off and laser - and retracting - retracting the camera now.

CAPCOM Copy.

CAPCOM And, Endeavour, Houston, over.

SC Go ahead.

CAPCOM Roger, Al, if you could get us a film budget status on the backside to give us when you come around, we'd appreciate it. And except for that, you're GO for LOS.

SC Alrighty, thank you, we'll see if we can conjure one up for you.

CAPCOM Good enough.

PAO This is Apollo Control, we're now about 1 minute, 15 seconds from losing radio contact with Endeavour. On the next revolution, the crew will be eating and then we plan to put them to bed. And we've had loss of signal now; we'll hear from the crew again in about 45 minutes. At that time, they'll be at the beginning of their 64th revolution of the moon. At the present time, the spacecraft is in an orbit 66.8 by 51.8 nautical miles. At 201 hours, 49 minutes, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control, and we'll be back in radio contact with Endeavour in about one minute. The spacecraft is now on its 64th revolution of the moon and the orbit at the present time is 66.8 551.8 nautical miles. On this pass the principle activity will be to get everything set for the crew to begin their rest period. They have an eat period scheduled and we'll be getting the regular pre-sleep status report from them. We do have an update on the numbers for the total sample collected on the lunar surface. The gross weight of the samples, the weight of the rocks and soil plus the containers, is 226 pounds and our best estimate at the present time as to the net weight of the samples alone is 175 to 180 pounds, and as we have acquisition of signal now on the spacecraft.

CAPCOM Endeavour, Houston. Over.

SC Houston, Endeavour, go.

CAPCOM Roger . . roger, if you guys give us an accept, we'll send you up a state vector and time uplink.

SC Rog, you got it.

CAPCOM Copy. And if you fellows will give me a call in the middle of your eating there, when you got time, we'll do some talking at you.

SC Okay, give us about 5 minutes here.

CAPCOM Okay.

CAPCOM And 15, its your computer. Over.

SC (garble) if you like.

CAPCOM Okay, while you guys are eating your supper there, it might be a good time to get a report on your food so far. How's it been going?

SC Oh, I think we have consumed every meal as planned and we've made a pretty good cut into the pantry.

CAPCOM You've made a pretty good cut into the pantry, you say?

SC Rog. That extra little box over there with extra little goodies.

CAPCOM Okay, and can you guys give us any estimates on the water that you and Jim consumed on the surface, say in the LM and on the EVA, and any differences between this and what Al's been consuming?

SC Not without sitting down and doing some thinking about it, we'll be glad to do that if you like.

CAPCOM Rog, if that's not too much trouble, I guess we could start out by some estimate as to how much you guys were drinking in the LM on the EVA. Was the drink bag adequate or what?

SC Oh, I think that is probably a good discussion for the debriefing after the flight.

CAPCOM Okay, sounds like you are at least eating and drinking a lot so far, we are anxious for you all to continue eating and drinking well because of the EVA yet to come.

SC Oh, okay, well if that's your interest, yes, we . . . we consumed quite a bit of water on the surface and we were quite satisfied with what we had and we had plenty and we've been eating and drinking a lot up here. I think everybody is in fine shape and ready to take care of what is on the Flight Plan the rest of the way.

CAPCOM Sounds good, one other specific point, we'd like to clear up Dave, which I guess was a little muddled this morning. Did you and Jim take the Seconal last night or not?

SC No, there's been no medication taken by anybody on the flight.

CAPCOM Okay, however, I . . . we down here would like to recommend for all 3 of you to take one tonight just to make sure we get another good night's sleep.

SC I think that's unnecessary.

CAPCOM Well that's our recommendation anyway. And can you tell us who plans to sensor up tonight, Dave.

SC Okay. Rog, I guess as per our agreement this morning, why you'll get CMP and a LMP tonight.

CAPCOM Rog, understand, and then we'll press on with a normal Flight Plan tomorrow. And Al, we'd like to have you wear the light weight headset tonight because then we'd like to wake just Al up on schedule so he can do us a P20 to give us some plus X time on the mass spec. And so we'd like to arrange it that way if its convenient with you guys.

SC Oh, I don't think that's practical, Bob, you can't have one person awake in here and the other two sleeping. It . . . just can't do it.

CAPCOM Okay, understand, and to avoid what we had last night with all those last minute calls again, again, and again, why don't you guys give us a final call just before you're ready to go to sleep, we'll get a final status down here, then we won't have to keep calling back tonight.

SC Oh, that's a good idea, all right, we'll do that.

CAPCOM It got a little embarrassing down here after a while.

SC Ah that's okay, yesterday was a long day.

CAPCOM Roger that. And we got a TEI 69 pad down here when Jim's ready to copy, and we're also ready to copy

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CAPCOM some torquing angeles and that P52 if you
got them, and we'd like you to leave your high gain antenna
at plus 25 and 185 on yaw and in narrow and reacquire as
you go around the corner this time.

SC Oh, okay, you want narrow, reacquire and
plus 25 and 185. We'll do that, if you are ready to copy, I've
got the P52.

CAPCOM Rog, I'll copy that now.

SC Okay, NOUN 05 was .01 and NOUN 93 was
plus .07 minus .47 minus .05. We were torqued out at
202 00 30.

CAPCOM Roger, copy .01 plus .07 minus .47 minus .05
and 202 00 30.

SC Rog, that's cricket.

END OF TAPE

CAPCOM And Dave, we'd like optic zero at this time please.

SC Oh, yes, optic zero. Hey by the way, I should have said .007, pardon me, I had my decimal point in the wrong spot.

CAPCOM Understand .007. And was the -

SC Just put a zero in front of all the pre torquing numbers. The platform is pretty good and the numbers are so small we're not even thinking in 3 digits anymore.

CAPCOM Okay, we've got 007, 047, and 005, understand.

SC That's correct.

SC Okay, Bob, I'm ready to copy the pad.

CAPCOM Okay, Jim, it's TEI 69 SPS G&N plus 36245 plus 061, plus 092 213 51 51 04 plus 280 31 minus 046, 54 minus 009 96 179 132 353, rest of the pad is NA ullage 4 jets 12 seconds, over.

SC Okay read back for TEI is SPS G&N - Are you reading me better? Bob are you reading me okay?

CAPCOM You've got a loud squeal there Jim but I can probably read you.

SC Okay, Bob here's the read back, SPS G&N 36245 plus 061 plus 092 213515104 plus 28031 minus 04654 minus 00996 179 132 353, 4 jets for 12 seconds, over.

CAPCOM Roger Jim, copy, good read back, and Endeavour, that's all we've got for you right now, until you give us a presleep call, except for standing by for a film budget report from Al.

SC Houston, 15.

CAPCOM Go, go 15.

SC Okay Bob, I've got that film thing compiled for you if you want to copy.

CAPCOM Copying.

SC Okay, I will read you frames expended, magazine nector 76, lobster 58, romeo 55, victor 12, and I haven't used anything out of S, and L is running right now on the mass spec.

CAPCOM Roger copy, 7658 55 and 12. Thank you guys. Give us a call when you're ready for sleep and we'll tuck you in.

SC Okay Bobby, love to have you do that.

CAPCOM And Endeavour Houston, we'd like pan camera stand by.

SC Okay Bob, roger on stand by. Houston, the pan camera was on stand by.

CAPCOM Say again 15.

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SC I say the pan camera already was in
stand by.

CAPCOM Okay, we'll have them check again. Okay,
Dave what we'd like is power on, also pan camera power on
for 5 minutes.

SC Okay, power on.

CAPCOM And Endeavour, this is Houston, we
can go pan camera power off, now.

SC Roger, power off now.

CAPCOM Thank you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 GET 20317 CDT 1950 585/1

SC Houston, Endeavour, did you get the E mode dump.

CAPCOM Stand by.

CAPCOM Endeavour, Houston. Its not clear that we got it the first time. Why don't you give us another E mode dump again, please.

SC Okay, coming down.

CAPCOM Thank you.

CAPCOM And Endeavour, Houston. As far as the LOS in about 2 minutes everything looks in configuration for sleep. We'd like to verify the oxygen heaters are auto auto off. Except for that you are go for sleep and go for LOS.

SC Okay, understand and we're fixing to give you the presleep checklist, there and we have a little unscheduled maintenance on our friendly water valve again. So we'll be about 10 more minutes, but it's under control, same problem we had before.

CAPCOM Roger, and understand it's under control.

SC Yes, it's just the same thing, worked loose again and we're cinching it down.

CAPCOM Roger, we copy. You guys didn't strike a coral reef there, did you.

SC (laughter) no I don't think so. Okay - 02 heaters are going to auto auto off.

CAPCOM Roger, auto auto off.

SC Rog.

PAO This is Apollo control. We've had loss of signal with the spacecraft. Just before going around the corner Dave Scott reported that they had again the problem that they experienced earlier in the flight, and had very quickly gotten it under control. It was a water leakage, coming from a diaphragm in the lower equipment bay where the crew inject chlorine into their potable water system to maintain the purity of that system and the water there. And what apparently is happening is that a nut is working its way loose and allowing water to seep out from around the diaphragm and the procedure to prevent the leak or to stop it is simply to take a allen head wrench which the crewmen have onboard and tighten the nut down and Scott reported they had done this. We would not expect to have any further conversations with the crew. They are now or will shortly be in their rest period. We'll be reacquiring in about 45 minutes. Prior to beginning the rest period we received a crew status report and Scott reported that they had all been eating their meals as scheduled and have been consuming plenty of water. And he said that everyone is in fine shape and ready for the EVA. At 203 hours 47 minutes, this is Apollo control, Houston.

END OF TAPE

PAO This is Apollo Control and we're now less than 30 seconds from regaining radio contact with Apollo 15. And we do not expect to hear from the crew for the remainder of their sleep period. It's a scheduled 8 hour rest period. And we said goodnight to them before we lost radio contact at the end of the last revolution. And we presume that they're either going to be asleep or close to it. We will have biomedical data on the Lunar Module Pilot, Jim Irwin and also on the Command Module Pilot, Al Worden. And INCO says we have acquired the signal; we'll be waiting for the signal strength to come up so that we can see the data on all of the spacecraft systems and also the biomedical data. And we will expect from this point on through the remainder of the rest period that it will be rather quiet here in Mission Control.

PAO The Flight Surgeon has gotten his biomedical data and reports that based on the heart rates he's seeing right now, it does not appear that the crew has gone to sleep yet. We'll continue to watch those through this front-side pass and the Surgeon will get a fairly good indication of when the crewmen are beginning to settle down and get to sleep.

PAO This is Apollo Control; we're getting quite a bit of noise on the air to ground circuit at this time. And since we do not anticipate any further conversations with the crew aboard the Spacecraft during this sleep period, we'll take the air to ground line down and leave the recorders running to play any conversations that we should get should we hear from the crew. At 204 hours, 37 minutes, this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 GET 205:44 CDT 22:18 587/1

PAO This is Apollo Control at 205 hours 44 minutes. Apollo 15 has gone around the corner of the moon on it's 65th revolution, spacecraft in good shape. The Flight Surgeon reports the crew has been asleep, based on the biomedical data we're getting from Jim Irwin and Al Worden for about 30 minutes now. Prior to the beginning of the rest period the crew set up the gamma ray and X-ray alpha particle experiments in the scientific instrument module bay. Also the mass spectrometer and while they're asleep these instruments will be gathering information in lunar orbit on the surface properties and atmospheric characteristics of the moon. We'll be reacquiring Apollo 15 in about 43 minutes. Again we do not expect any conversations with the astronauts during the sleep period, 8 hour rest period. We'll come up at acquisition of signal and again loss of signal for periodic status reports and in Mission Control the principle activity will be to monitor spacecraft systems and biomedical readings from the crewmen. At 205 hours 46 minutes, this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 GET 206:30 CET 23:04 MC588/1

PAO This is Apollo Control, we are about to reacquire the spacecraft now on its 66th revolution of the moon. INCO says we have gotten radio contact now and we'll stand by to take a look at all of the spacecraft's systems biomedical data on the crew and reassure ourselves that everything continues to be the same normal situation that it was when last we saw the spacecraft about 45 minutes earlier. The crew at this time is in the midst of a sleep period and we're not scheduled to awaken them for nearly 5 hours. Flight director Glynn Lunney will be checking with his systems engineers to assure that everything is normal. Guidance and Control Officer reports everything looks good and EECOM says everything is GO from his point of view. The cabin pressure at this time is 5.2 pounds per square inch which is normal and the temperature about 73 degrees. Surgeon says based on heart rates he is seeing, it appears that the crew is still asleep at this time. We'll continue to monitor the systems on telemetry data and provide status report periodically at acquisition of signal and again just before we lose radio contact. AT 206 hours 32 minutes, this is Apollo Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/3/71 GET 207:12 CST 2346 MC 589/1

PAO This is Apollo Control at 207 hours 12 minutes. The mission continuing to progress smoothly this evening. We have about 4 hours 13 minutes remaining in the crew sleep period. And, in Mission Control we are in the midst of a shift handover. Flight Director Milton Windler coming on the releive Flight Director Glynn Lenney. We will not have a Change of Shift Press Briefing. We have about 30 minutes remaining in this pass before we once again loose radio contact with ENDEAVOUR. And we plan to provide Status Reports at acquisition of signal and loss of signal. In between times though, we will have the lines down with the tape recorders running to pick up any conversation should we hear anything from the crew. The Spacecraft Communicator on the coming shift will be astronaut Carl Henize relating astronaut Bob Parker in that role. At 207 hours 14 minutes, this is Apollo Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/4/71 217 CDT 209:42 GET 590/1

PAO This is Apollo Control. 209 hours 42 minutes ground elapse time. 1 hour 43 minutes remaining in the Apollo 15 crew sleep period. A little over a minute ago Apollo 15 spacecraft, Endeavour, went behind the moon during the end of the 67th lunar revolution. All well aboard the spacecraft all systems are percolating normally. Apollo 15 in an orbit measuring 52 nautical miles at pericynthion and 66.6 apocynthion. Current height is, or AP LOS was 52.2. The velocity 5 387 feet per second. During this last front side pass the cabin pressure was holding steady 5.2 pounds per square inch and a temperature of 72 degrees. At about 4:15 Houston time the lunar surface television camera on the Rover vehicle just east of what is left of the lunar module Falcon descent stage will be powered up for about 15 minute look around in the landing sight area, camera will be zoomed and panned only, but no tilt commands will be given. It will pan the local horizon and also zoom in on some local features such as craters and outcroppings for geology investigators. And at 209 hours 45 minutes ground elapse time this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/4/71, 3:50 CDT, 211:16 GET, 591/1

PAO This is Apollo Control 211 hours
16 minutes ground elapsed time. The communications officer
Ed Fendell here in the Control Center has just - either has
or is preparing to send a turn-on command to the color TV
camera left at Hadley Base. And we're some 9 minutes away
from the wake-up call to the crew of Apollo 15 still in
lunar orbit around the moon. Where else would you have
lunar orbit? Still waiting for the first glimpse of the
color picture. Starting to get a signal in now. And the
camera is alive and well at Hadley Base, swinging around to
get a view of the descent stage of Falcon. There's the ALSEP
station looking somewhat like Boot Hill from a distance.
And there sits the lower half of the great bird Falcon.
Fendell is panning the horizon from one stop to the other
which is something like 340 degrees around. The geologists
are interested in seeing the terrain over an increased sun
angle - with an increased sun angle since the last look.
Also, the camera will be zoomed in on the individual features
in the landing site. However, the camera will not be tilted
at this time. Looking backwards from the front of the Rover
to the Rover control console. It should be about the maximum
amount the camera will pan in that direction before it hits
the stop. The camera temperature has reached it's upper
limits of design specifications toward the end of EVA-3,
but it is hoped that the way the camera was stowed, the final
position it was left in that the shadow of the camera itself
and the fact that it was powered down would cool the drive
mechanism and perhaps alleviate the slipping clutch problem
encountered during EVA-3 in which the camera several times
tilted straight up. Beginning wide angle panorama to the
right, stopping briefly to allow color polaroid photos to
be made from a TV monitor which later will be taped together
to form a photo mosaic continuous panorama, almost a full
circle. Okay. Do it now.

PAO The spacecraft communicator is pre-
paring at this time to make a call to the crew. Punching
up his air/ground button on the console.

CAPCOM Apollo 15. Apollo 15, this is Houston.
Good morning. Apollo 15, this is Houston with a message from
Richard Strauss, Arthur C. Clarke and Stanley Kubrick.

CAPCOM Good morning, fellows. We have only
about 10 minutes of comm left and we'd like to start out the
morning with an ACCEPT so we can send you up a state vector.
Are you up there?

CAPCOM And after giving us ACCEPT we'd like
to have you manually roll clockwise 40 degrees and then we'd
like to get the sharp end forward. I'll give you the P20
when you're ready to copy.

PAO Camera now aimed at Mount Hadley.
Close up of some of the - -

APOLLO 15 MISSION COMMENTARY, 8/4/71, 3:50 CDT, 211:16 GET, 591/2

SC - - 15.
CAPCOM Good morning, Al. How are you doing?
SC Good morning, Karl. I'm doing just
fine.
CAPCOM Right-o. If you didn't hear what I
said before I'd like to repeat that we'd like to have ACCEPT
and we'll send you up a state vector and then we need to
manually roll - -
SC Roger. You've got ACCEPT.
CAPCOM - - clockwise - Right-o. Then we
need to manually roll clockwise 40 degrees and I have here
P20 data for you to get the sharp end forward.
SC Okay. We rolled and stand by while
I get a pen. Okay. Go ahead with the P20.
CAPCOM Roger. P20 option 5, plus X forward
SIM attitude, the time is 211 plus 40. VERB 23 NOUN 78 plus
180.00. The attitude is 141, 000/177, 000.
SC Roger. Karl, understand, you want
that P20 turnaround done at 211 plus 40 instead of 212:00.
CAPCOM Al, we'd like to have you start the
maneuver as soon as we finish the uplink and that time is
the time we should be completing the maneuver.
SC Okay. Fine, Karl. I'll just move
that whole thing up. We're doing the roll maneuver now.
CAPCOM Roger. And while you've got the
flight plan there, the only update that concerns us for
the next hour and a half is to - over there at 2154 delete
manual - manually roll clockwise. You got that one?
SC Roger.
CAPCOM And everything after that all the way
down to 212 plus 20 and then we'll be in contact with you
again for further updates.
SC Okay. Understand. That block between
2154 - or 211 plus 54 and 212 plus 20, that all goes as -
as scheduled.
CAPCOM Entire thing deleted. Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 211:31 CDT 4:05 592/1

SC Roger. Then we'll be in P20 attitude.
Standing by for your word when we get contact again.
CAPCOM Okay, Al, the computer's yours.
SC Roger. Understand.
CAPCOM Al, would you do a VERB 66 for us?
SC Roger. You got it.
CAPCOM Al, we need the TLM switch in block, please.
SC Rog, Karl.
CAPCOM 15, if you'd like a quick consumables update
I can give it to you now or I can wait until the next rev.
SC Go ahead, Karl. If there's time, I'll copy
it now.
CAPCOM Roger. The time is 211 plus 00, RCS total
46, QUADS ALPHA 48, BAKER 45, CHARLIE 44, DELTA 46; hydrogen
tanks, 49 47 39; oxygen tanks, 61 64 48. Fifteen, this is
Houston. Are you still reading?
PAO And the good ship Endeavour has gone behind
the moon for the 68th time. Wake-up call by spacecraft
communicator Karl Henize, was followed by a brief passage
from the music used in the motion picture, science fiction
motion picture "2001," which in turn had been borrowed
from the tone poem by Richard Strauss, "Also Sprach
Zarathustra." It'll be another 47 minutes approximately,
before acquisition of signal with Apollo 15 coming around
on the 69th revolution. And at 211 hours 41 minutes ground
elapsed time, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 212 hours 21 minutes ground elapse time. The color television camera left at Hadley Base by Apollo 15 crewmen Dave Scott and Jim Irwin was found to be alive and well this morning when it was commanded to wake up. The camera made a slow panorama for the benefit of lunar geologists who wanted to view the features around Hadley Base at a higher sun angle. Only zoom and pan commands were sent to the camera for it was feared that the tilt clutch might again slip and cause the camera to tople belly up on its mount as it did several times during Scott and Irwin's third moon walk. There would be no one out there to right the camera if it tilted straight up again. Signals from the camera stopped suddenly when the down link was hopefully lost temporarily. We're less than 2 minutes away from aquisition of signal with Apollo 15 on the 69th revolution. We'll leave the air-ground up and catch the first words as the crew of Apollo 15 begin their day's work.

CAPCOM Apollo 15 this is Houston. How do you read?

SC Hi, Houston, 15. Loud and clear, how else?

CAPCOM Hi, Dave. You're coming through loud and clear. How did our consumables update get to you. Okay?

SC Okay, we got everything but the oxygen.

CAPCOM Okay, do you want me to read those three up?

SC Okay, go ahead.

CAPCOM Roger. Oxygen tanks at that same time that I gave you originally were 61, 64, 48.

SC Okay. 61, 64, 48 and I have a P-52 for you and a crew status report.

CAPCOM Fire away with them.

SC Okay, the P-52, now 05 was .01, now 93 was plus .029 minus .025 plus .018 was torqued out at 211 52 00.

CAPCOM Roger.

SC And if you still have your pencil handy, why the sleep came out to 7, 7 3/4, and 7 and the PRD's 25026 23 182 and 08 033 and go ahead with your updates.

CAPCOM Roger. Okay, flight plan updates for the coming rev and there's several of them here. And just to keep you feeling a little bit more optimistic on following revs there are very few updates. Okay, at 212 40. We want to delete map camera image motion increase. At -

SC (garble) deletion at 212 40. Go.

CAPCOM Roger. At 213 plus 24. We want to delete the Gammeray Boom Deploy and that there are - -

SC 13 24 ave the deletion.

CAPCOM Roger. And just below that the MSFN verify lens tuck in and also the pan camera power off delete both

APOLLO 15 MISSION COMMENTARY 8/4/71 455 CDT 212:21 GET 593/2

CAPCOM of those.

SC Roger. Copy the next two deletions also.

Go.

CAPCOM At 214 pus 02. We want to change that camera configuration to 250 millimeter lens, 250. The f-stop should be 5.6, the exposure time should be 1 over 125.

SC Roger. 214 02. Camera configuration 250 millimeter lens, F 5.6 at 11 22. Go.

CAPCOM Correct. At 214 plus 06 add mass spectrometer ION source off, experiment stand by. And at the same time add logic power to deploy retract.

END OF TAPE

APOLLO 15, MISSION COMMENTARY, 8/4/71, CDT 5:12, GET 212:32, 594/1

SC Roger. At 2 14 06 mass spec ion OFF
experiment stand by logic power Z-boom retract-go.

CAPCOM Roger. At 214 plus 11. If ION source OFF
5 minutes. Mass spectrometer boom retract. 15, we'd like
high gain auto.

SC Okay at 214 11 if ION off for 5 minutes
mass spec boom retract. Go.

CAPCOM At 214 plus 12, we add mapping camera/lazsr
experiment covers open, mapping camera track extend,
mapping camera image motion on.

SC Okay, 214 12 map laser experiment open.
map track extend and image motion on.

CAPCOM Roger. At 214 plus 16 we change the EL on
to T stop minus 140 to T start 140. We simply change stop to
start.

SC Roger. Stop to start. Go.

CAPCOM And at 214 plus 17 again, change stop to
start. And at that time also, add laser altimeter on.

SC Okay. 214 17 stop to start and laser
altimeter on. Go.

CAPCOM Ant at 214 plus 18 change mapping camera
on off to mapping camera on on. In another words, change off
to on at parenthesis T start. Delete the next line, mapping
camera,- delete mapping camera on, stand by. And the 3rd
line chnage mapping camera image motion OFF, to mapping
camera image motion increase. Barber pole plus 4 steps/on.

SC Okay. 214 18 map camera image motion increase,
Barber pole plus 4 steps/on.

CAPCOM Roger. And did you get the mapping camera,
on, on T start?

SC Roger. Map camera on, on, T start and
scratch the map camera on stand by.

CAPCOM Roger. That takes care of all the updates
required for the next rev.

SC Roger understand. Thank you.

CAPCOM 15, this is Houston. A couple of comments
and then a one change in your G and C check list. The
comments are as follows. As you will note, from the con-
sumables update, we now have single tank capability at the
40 amp level. And, concerning the mass spectrometer boom
problem, it appears to us that this is temperature associated
problem and the next time you retract the mass spectrometer,
boom, we suggest that you retract it only once for 4 minutes.
And if it hasn't gone gray, just leave it there. There is
no need to go in and out until it turns gray. That won't be a
critical problem until we come closer to a burn.

SC Okay. Understand, just retract it for
4 minutes and leave it there. Okay?

CAPCOM That's right. And has somebody got a G and C
check list, there on page 9-4?

SC Okay, stand by. We'll pull it out.

SC All right I've got page 9-4, go ahead.

CAPCOM All right we'd like to correct one of the
short burn constants, and it's in column D, row 5.

APOLLO 15, MISSION COMMENTARY, 8/4/71, CDT 5:12, GET 212:32, 594/2

CAPCOM The number should be changed from 101605,
it should be changed to 01614.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/4/71, 5:17 CDT, 212:41 GET, 595/1

SC Say again the location.
CAPCOM It's column Delta, row 5.
SC Okay. I've got it now. I'm sorry.
I thought you said B, Bravo. How about reading that number again please.
CAPCOM Roger. The correct number is 01614.
SC Okay. 01614 by 01605.
CAPCOM That's correct.
CAPCOM And whenever somebody tells me he's ready to stop breakfast and copy a pad I have TEI 71 and also a mapping camera photo pad.
SC All right. Stand by one, please.
Probably a couple of minutes.
CAPCOM Right-o.
SC Okay, Karl. I'm ready to copy the TEI pad.
CAPCOM Roger, Jim. Good morning. TEI - -
SC Good morning.
CAPCOM - - 71, SPS G&N. The weight is not applicable. P trim NOUN 48 is plus 064 plus 098, 217, 49, 1804, plus 28386, minus 05810, minus 00277, 178, 129, 351, the rest is N/A, four jet ullage for 12 seconds. And that's all.
SC Okay. TEI 71 readback. SPS G&N. Weight is N/A, plus 064 plus 098, 217, 49, 1804, plus 28386, minus 05810, minus 00277, 178, 129, 351, four jets for 12 seconds. Over.
CAPCOM Roger. Roger, Jim. And would you repeat the yaw trim.
SC Yaw trim was plus 098.
CAPCOM That's all correct. Thank you.
CAPCOM And the last bit of information I have down here is a mapping camera photo pad. At 214 plus - -
SC Okay. Go ahead.
CAPCOM Roger. It's at 214 plus 20 in your flight plan and there is no slot for it. You'll just have to stick it in.
CAPCOM Mapping camera, start, 214:20:03, stop, 215:19:49.
SC Copy 214:20:03 and 215:19:49.
CAPCOM That's correct.
CAPCOM 15, this is Houston. With just a passing comment to Dave. We have Lee Silvers and Jim Head in the back room available for any questions or comments concerning the lunar surface activities that you'd like to make. Is there anything on your mind you'd like to discuss with them?
SC Well, it shouldn't take more than about a couple of weeks, I guess, if we started now. I guess

APOLLO 15 MISSION COMMENTARY, 8/4/71, 5:17 CDT, 212?41 GET, 595/2

SC we got a lot to discuss with them.
We've talked it over a little bit and we've come to some
conclusions about rilles and mountains and those sort of
things and I guess rather than get into the details now,
we probably ought to wait till the debriefing. If they have
any questions for us, we'd be happy to answer.

CAPCOM Okay. It's my understanding that
they didn't - you gave them so much data they didn't really
have any questions left but stand by. I'll see if they -
if they come up with some after you've invited them to -
(garbled) says, hey, they just might have - -

SC Okay. Understand.

CAPCOM - - some. Stand by.

SC Yes. That's right. I've never seen
the day yet when those two didn't have some questions.

CAPCOM You opened yourself up there, Dave.

END OF TAPE

SC Yeah, that's right. I've never seen the day yet when those 2 didn't have some questions.

CAPCOM You opened yourself up there Dave.

SC Yeah, that's good. We're ready.

CAPCOM 15, this is Houston.

SC Go ahead Tom.

CAPCOM Lee and Jim are setting right beside me here; and they're comment is they don't really want to ask very many questions and perturb the debriefing a week from now; but they do just have a couple. And the first one concerns a unique crater close to SCARP that you described as having about a 40 meter diameter with a very soft rim; and the texture of the material in it was, instead of being fine angular fragments, was more in the form of clods. They would like to know a little bit more if possible about it's location relative to SCARP, and any other comments you can make about the unique, the particular uniqueness, of this crater.

SC Okay. Stand by One.

SC Okay Houston. I guess our answer to that is that we had interpreted that particular crater as being SCARP. Perhaps it wasn't. Perhaps we were near SCARP and that was a somewhat smaller crater; but I guess as we remember it, that was the one we had called SCARP; and it was, I believe, the only crater we really sampled as we approached RIM Crater in the terrace there. And that particular crater had very soft, ----, extremely soft, and all the fragments, the apparent fragments, were very frangible. They just fell apart like dirt clods. And we did sample some; and we had a discussion, I think, at the time and I guess we still don't exactly agree relative to the amount of glass that was present in the fragments. Jim seems to think there was a fair amount; and I don't remember any particular; but it was a fairly uniform crater. And all the debris around the crater as I remember, there was something like 20 percent or so of angular frags; all of it apparently would break apart very easy; and there were no solid fragments that we could see or distinguish. Of course, everything was covered by dust; and we did sample some; and I guess that's about the size of it. Is there anything more specific you'd be interested in?

CAPCOM Dave, this particular crater sounds more and more interesting to the people down here; and I guess the next question is, was there anything about the crater. It's shape or anything else, that would lead you to think it had a different origin than most of the other impact craters?

SC No. It's depth to diameter ratio was about par for the course up there; and it had a slightly raised rim; and the rim may have been somewhat higher than others; but I wouldn't be able to distinguish that specifically. It was a rather standard appearing crater until we walked up onto the rim; and it was extremely soft; and of course we only sampled one edge of the rim there. We didn't get any circumferr-

SC ----- tial sampling on it, so it might have been a unique part; but it looked pretty uniform all the way around.

CAPCOM Roger.

SC And, we did get the appropriate photographs plus a (garble) at that site, which, I think, when we go over during the debriefing perhaps we could extract some more of what we say. As you remember, at that particular time we were pretty well hustling and we didn't have a chance to do much looking at the map since we got there.

CAPCOM They say that's Great. Thank's a Lot.

SC Okay. Anything else?

CAPCOM Hey, Dave, you've done a lovely job. You've just don't know how we're jumping up and down down here.

SC Well, that's because I happened to have had a very good professor.

CAPCOM A whole bunch of them, Dave.

SC That's right. As a matter of fact, so many of them it's just hard to remember it all; but we sure appreciate all you all did for us in getting us ready for this thing. And, I'll tell you. I think Jim and I both felt quite comfortable when we got there, about looking around and seeing things. I just wish we had had more time; because, believe me there is an awful lot to be seen and done up there.

CAPCOM Yeah. We think you would define the first site to be revisited on the Moon.

SC Well, as we go around in Lunar Orbit here, I can look down and I could just spend weeks and weeks looking, and I can pick out any number of superb sites down there which would take you several weeks to analyze on the surface. There is just so much here - to coin a phrase, it's mindboggling.

END OF TAPE

CAPCOM (Silver) Yes. We think you'd define the first sight to be revisited on the moon.

SC Well, as we go out in lunar orbit I can look down and I can just spend weeks and weeks looking and I can pick out any number of superb sights down there, which would take you several weeks to analysis on the surface. There's just so much here to here to coin a phrase, it's mindboggling.

CAPCOM (Silver) Beautiful, Dave. Thank you so much.

SC Yes, sir. I hope someday we can get you all up here too. I think we really need to have some good professional geologists up here. As a matter of fact good professional scientists of all disciplines not only in lunar orbit, but right on the surface because you all would just really have a field day with your backgrounds and what you know. There's just so much to be gained up here.

CAPCOM (Silver) Great, Dave. Thanks a lot.

PAO This is Apollo Control in the discussion with the crew on the observations in geology at the Hadley Base landing sight with spacecraft communicator, Karl Henize. Henize was joined by a doctor Leon T. Silver of California Institute of Technology, who is one of the mission geologist for Apollo 15.

CAPCOM 15 this is Houston. Just a point of curiosity are you guys seeing aristarchus and Schroter's Valley in daylight yet?

CAPCOM 15 this is Houston. 3 minutes to LOS and all your systems are go.

CAPCOM 15 this is Houston. How do you read?

CAPCOM 15 this is Houston. Could you give us a COM check, please.

PAO This is Apollo Control. We've had loss of signal as Apollo 15 sailed around behind the moon again. Nearing the end of the 69th lunar revolution. Back around the eastern side of the moon, back in view of the big dishes in the manned space flight tracking network in about 47 minutes. And 213 hours 38 minutes ground elapse time this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 5:07 CDT 6:55 598/1

PAO This is Apollo Control 214 hours 22 minutes ground elapsed time. Less than a minute to acquisition. As Apollo 15 comes around to the front side of the moon on the 70th lunar revolution. The crew by this time should have tidied up from their morning meal and be settling down for a fairly busy day's work. Orbital science task and later on in the day, the shaping burn for jettisoning the little mini-satellite. Ten seconds away, we're standing by from - for notice from the network controller that - we have acquisition of signal. Spacecraft communicator Karl Henize sitting back down at the CAPCOM's capsule and should be calling the crew with some additional flight plan updates. We're up and live on air/ground 1, this is Apollo Control.

CAPCOM 15, this is Houston. How do you read?

SC Houston, 15. Loud and clear.

CAPCOM Roger, 15. We're reading you loud and clear. We have flight plan updates available any time you're interested in copying it.

SC Okay. Stand by 1.

SC Okay, Houston. Go ahead with your updates.

CAPCOM Roger, Dave. We'd like to have you start the battery A charge first.

SC Roger. We just started it.

CAPCOM Okay. Flight plan updates; 214 plus 41. We delete several lines there. Pan camera mode stand by. Power ON, stereo exposure normal and pan camera mode to operate, all deleted.

SC Rog. Understand. Three lines deleted. Deleted at 214 41. Go.

CAPCOM Rog. At 214 plus 50 we delete, pan camera mode stand by and MSFN verify lens stuck in.

SC Roger. 214 50 delete 2 lines. Go ahead.

CAPCOM At 214 53 delete pan camera power OFF, and at 55 delete gamma ray boom deployed.

SC Rog. At 53 and 55 delete one line each. Go.

CAPCOM At 215 17, we add, map camera ON, switch OFF, parenthesis T stop, laser altimeter OFF, map camera ON, stand by T stop plus 30 seconds. Map camera image motion OFF.

SC Stop, break - break, Karl. Try it again, a little slower so I can write it.

CAPCOM Roger. 215 plus 17 first line map camera ON OFF parenthesis T stop. Second line laser altimeter OFF. Third line mapping camera ON to standby T stop plus 30 seconds. Fourth line mapping camera image motion OFF.

SC Okay. Copy 215 17 map camera ON to OFF T stop. Laser altimeter OFF, map camera ON to stand by at

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 5:07 CDT 6:55 598/2

SC T stop plus 30 seconds and map camera image motion
to OFF.

CAPCOM Roger at 215 plus 19. Add Gamma ray boom
deploy.

SC Okay, 215 19 gamma ray deploy. Go.

CAPCOM 215 plus 25 delete laser altimeter off.

END OF TAPE

APOLLO 15, MISSION COMMENTARY, 8/4/71, CDT 7:06, GET 214:31 599/1

SC Scratch 215 15 delete laser altimeter OFF.
Go
CAPCOM Over. At 216 01, laser altimeter on, is
move down to 216 plus 15.
SC Okay. 216 01 laser altimeter in deleted
at 216 15 laser altimeter on. Have it. Go ahead.
CAPCOM Correct. 217 plus 14, add laser altimeter
to off.
SC Okay. 217 14, laser altimeter off. Go.
CAPCOM At 217 plus 20, we delete 3 lines. Mapping
camera image motion, mapping camera on, and mapping camera
image motion steps. All three.
SC Okay. 217 21 delete 3 lines. Got 'em.
Go ahead.
CAPCOM Right. And, in that place at 217 20 put
the line down below, 217 25 GAMMA RAY BOOM deploy.
CAPCOM Okay. At 217 20 we should have GAMMA RAY
BOOM deploy minus 217 25.
CAPCOM Roger. At 218 02 we change the camera
configuration there. We're going to use window 5 CM 5.
We need the 80 MM lens, 8 0 MM lens, and the setting should
be stop 2.8, exposure time 1 over 2 5 0.
SC Okay. 218 02 use CM5 EL 80 MM 2.8 12 50th.
CAPCOM And the note there is use the Lexan shield
on CM5, in other words, leave it on the window.
SC Okay. Lexan shield. Got it.
CAPCOM At 21810 delete mapping camera image motion
increase.
SC Okay. Want mine deleted at 21810. Go.
CAPCOM At 218 plus 14 we add: laser altimeter ON.
We have four lines here, mapping camera image motion ON;
mapping camera On to on at T start; mapping camera image motion
INCREASE; talkback barberpole plus 4/ON.
SC Okay. 21814 laser altimeter ON; mapping
camera image motion to ON; mapping camera ON to on at T start;
and mapping camera image motion INCREASE; and talkback barber
pole plus 4 seconds/ON.
CAPCOM Roger. At 220 plus 07 we add: pan camera
mode standby; power on; and that will be mono and exposure
normal.
SC Okay. 220 07 pan camera to standby; power
on; mono exposure normal. Go.
CAPCOM AT 220 plus 13 we add: pan camera mode
OPERATE at T start.
SC 220 13 pan camera to OPERATE at T start.
CAPCOM Roger. And about 220 18 expect the talkback
showing you film depletion - the film finished. At that time,
go mode standby and wait for a MSFN cue to go power OFF.
And 15 we'd like to have high gain on --
SC Okay. 220 18 pan camera - 220 18 should have
film depletion, pan camera to barberpole then go standby and
wait for MSFN cue for power OFF. Go.

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CAPCOM And that's the end of the update.

SC Okay. And I guess when you run out of film,
you run out of updates.

CAPCOM That's about the size of the situation.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 214:38 CDT 7:12 600/1

CAPCOM 15, Houston. If you're willing to listen, I have about 3 minute update on the morning news.

SC Stand by one, Carl.

SC Okay, Houston, 15. We're ready for the news.

CAPCOM Roger, 15. The flight of Apollo 15 is still front page news around the world. Even yesterday's relatively quiet activities were noted by most news media. The rail strike with the United Transportation Union has ended and ten railroads that were out of operation for 18 days are back on the tracks. Growers in California were hardest hit by the strike losing an estimated 45 million dollars in sales and related industries. President Nixon has asked Congress not to allow the use of federal funds to pay for busing school children. The administration also announced that it is appealing a bench mark court ruling against massive busing in the public -- in the public schools of Austin, Texas. Treasury Secretary John B. Connally is attempting to stop a rumored increase in bank interest rates. Connally said he is distressed to hear reports that bank prime lending rates are to be raised again. Rates were increased only last month. New York stock exchange prices fell yesterday in the second largest decline of the with the Dow Jones industrial average dropping almost 15 points. Analysts say that the decline may have been caused by the rumored increase in interest rates. You got up too early to hear much news of last night's baseball games but we can report that the Astros lost to the Cubs 5 to nothing. They did better Monday night when they beat the Cubs 2 to 1. The weather report from the Houston is one word: soggy. Rain has fallen off and on for more than 24 hours and there was a long steady rain most of yesterday afternoon. Going to be a lot of grass cutting to do when you get back down here, guys.

SC Oh, yeah, but we sure got nice sunny weather up here.

CAPCOM No clouds up there, huh? That's amazing.

SC No. It's as clear as a crystal.

CAPCOM Thinking about all that sunshine up there reminds me that we're in a bind down here about your exposure to UV and we recommend that on the several times on the next couple of orbits when you're requested to take the -- the Lexan cover off of window 5 that you alternate handling that photography to keep under the legal doses.

SC All right, we'll do that.

CAPCOM 15, Houston. The doctors are down here with their -- with their electrocardiograms to see the CMP or at least they think the CMP is on the biomed apparatus and according to flight plan, they'd like to have the LMP on.

SC Okay. We thought we'd give you both the

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SC since you were sort of interested in that
yesterday.

CAPCOM Hey, that would be great.

CAPCOM 15, Houston. We have a couple of camera
pads when you have time to copy.

SC Okay, stand by a couple of minutes, will
you please, Carl.

CAPCOM Rog.

SC Okay, Carl. I'll copy those pads for you.

CAPCOM Roger. They're in the flight plan at 216.

The first one is the solar corona photo pad. Key start is
216 03 55. Down below, the mapping camera photo pad. Start
216 18 30. Stop 217 18 15.

SC Copy. 216 03 55, 216 18 30, and 217 18 5 --
15.

CAPCOM That's correct.

END OF TAPE

CAPCOM 15 Houston. If you'll give us ACCEPT we'll send up a new state vector.

SC Roger.

CAPCOM 15 Houston, the computer is yours.

SC Roger.

CAPCOM Hey Al. I've sort of got an itch to hear what the Aristarchus region looks like in daylight. You got any comments?

SC Well I'll tell you Car 1, we've all been setting here kind of looking at Aristarchus a little bit in awe, it looks like probably the most volcanic area that I've seen anywhere on the surface. And certainly it's just very covered with rilles, very quite deep rilles to, some of them. Schroter's Valley for instance is a magnificent big rille which looks like it's worked, been worked twice. Of course the large rille and then a smaller rille inside.

CAPCOM What about the source of Schroter's Valley -

SC Several cones. Say again.

CAPCOM What about the source of Schroter's Valley. Does it look volcanic?

SC Well, that whole area in there looks volcanic, yea, and it certainly comes from up on the plateua there. I would guess that the Cobra Head is the source for Schroter's Valley. The elevation is a little subtle from this vantage point, but I guess that would be my guess, and as far as where the, think we've found something interesting anyway about the ends of the rilles, particullly around the Schroter's Valley area, it looks quite distinctly like the rilles, the mouth of the rilles or the Delta's have been covered with rising Mare, Mare materials from the lower elevations. Almost as if there was a rille with a Delta like deposit at one time, but then the Mare, the elevation of the Mare, or the height of the mare came up into the rille far enough to cover all that Delta area. So all you see now is what would look like a river into a lake who's elevation has increased.

CAPCOM Ah Ha! Very interesting thought.

CAPCOM 15, this is Houston. I'm turning you over to Joe now. I'll see you on the way home tomorrow.

SC Okay Carl, I'll talk to you tomorrow.
Thanks for coming out so early for us.

CAPCOM It was a pleasure, believe me.

CAPCOM Good morning yankee clipper, this is Houston.

CAPCOM Good morning Endeavour, this is Houston.

SC Good morning Houston, this is Endeavour.
How are you today?

SC Just fine, Dave.

APOLLO 15 MISSION COMMENTARY 8/4/71 GET21501 CDT0736 601/2

CAPCOM The devil in the backup command room made me do the other.

SC Oh, we're not surprised. It seems like that other fellow is hung up on that other flight for some reason or other.

PAO This is Apollo Control. Some 8 minutes remaining in this 70th lunar revolution front side pass. Hand over under way between Gene Kranz's flight team of flight controllers taking over from Milt Windler, maroon team. There will not be a change of shift press briefing, in as much as the crew was asleep during most of the off going shift. The lunar surface TV panoramic viewing test this morning began at about 3:53 with good quality pictures. The test was abruptly terminated about 12 minutes later when the lunar communications relay unit FM downlink went off. At the time the LCRU FM downlink was lost, small increment iris open (garble) open commands were being transmitted to the camera. The LCRU -

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 215:29 CDT 8:04 602/1

PAO - that FM downlink went off. At the time, the LCRU FM downlink was lost, small increment (garble) OPEN commands were being transmitted to the camera. The LCRU does not respond to power ON commands. Troubleshooting is now under way, and an attempt to determine the reason for the loss of the Lunar Surface TV signals. Apollo 15, now in a 52.3 by 66 nautical mile orbit. Present height 54.4 nautical miles, velocity 5373 feet per second. With some 6 minutes 52 seconds remaining before loss of signal, we'll continue to stay up live for the remainder of this frontside pass. At 215 hours 29 minutes ground elapsed time this is Apollo Control up and live.

CAPCOM Endeavour, this is Houston. We are about 4 minutes from LOS. You look to be in good shape to go around the corner.

SC Rog. Thank you, Houston.

PAO This is Apollo Control at 215 hours 35 minutes. Apollo 15 has gone behind the Moon on its 70th revolution, out of range of ground stations now. Here in the Control Center the handover is complete. Flight Director is Gene Kranz, CAPCOM Joe Allen. At 215 hours 36 minutes this is Mission Control Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/3/71, 8:54CDT, 216:20GET, 603/1

PAO This is Apollo Control at 216 hours 20 minutes. We're about a minute away from acquisition of signal. At approximately 9 o'clock this morning, on the television monitors in the news center, we will replay the video tape of this morning's test of the lunar surface television camera. This will be a video tape replay - will be video only, no audio. This test started at 3:53 a.m. central daylight time, this morning, lasted for approximately 12 minutes when the FM downlink from the lunar communications relay unit was lost. The LCRU has not responded to POWER ON command since that time, and this problem is still being studied. We'll stand by now for AOS on Endeavour.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/4/71 GET21626 CDT0900 604/1

CAPCOM Endeavour this is Houston GARBLE. (Static)

SC GARBLE reacq GARBLE.

SC Hello Houston, 15.

CAPCOM Hello 15, this is Houston.

SC Okay Joe we're reading you and we were in react and narrow and couldn't seem to pick you up so we're back in manual and medium now.

CAPCOM Okay Al we copy that. Thank you. While we are thinking about that one we've got a couple of requests for you here. We'd like for you to turn on your RCS propellant secondary. We are expecting a crossover in the DNC quads during the shape ullage and we can I guess use those on now. And I've got some small changes to your flight plan when you are ready to copy.

SC Okay Joe, I'm ready to copy changes in flight plan.

CAPCOM Okay Jim I seem to be reading you loud and clear GARBLE have a little noise in the background. Do you have your flight plan in front of you the first entry is at 217 plus 17 and it is an addition retract map camera. The next one is at 217 plus 21 addition close map camera and laser experiment covers. The third is at 217 plus 58 delete those two lines. 02 heater is 3. AUTO 02 heaters 1 and 2 OFF. Those are two deletions. Another deletion -

SC Okay, let me read that back to you, Joe.

CAPCOM Okay fine, Jim.

SC YOu have 217 17 retract the mapping camera and 217 21 close map camera and laser covers and then the deletion at 217 58 of the 02 heaters 3 and 02 heaters 1 and 2.

CAPCOM That's correct Jim and the next change is - it's a deletion at 218 02, and that is at the PCM cable line there.

END OF TAPE

CAPCOM And that is delete the PCM cable line now. And down a couple of inches at 218 08, an addition, map camera and laser experiment covers to open and extend map camera. Read back.

SC Okay. I understand to delete the PCM cable at 218 02 and that at 218 08, map camera and laser covers open and extend mapping camera.

CAPCOM The readback is correct and the next -- next change is at 219 07 and once again, delete the PCM cable line and at 219 17 add laser altimeter off. Close map camera and laser experiment covers and delete map camera extension. And the last addition, that is to say, the last change is at 220 plus 05 delete the PCM cable line, over.

SC Okay. I copied 220 05 delete the PCM cable and go on back to page 4. We deleted the PCM cable there at 219 07 and 219 17, a new item, laser altimeter off. Close mapping camera and laser experiment covers and then delete the next line, the map cameras track to extend.

CAPCOM Sounds good, Jim, and that's all I have for the moment. We do want a verification that all 4 propellant secondaries are open on your RCS, please.

SC Okay. That's verified. Just opened.

CAPCOM Okay. Thank you.

CAPCOM Endeavour, this is Houston. We'd like auto on the high gain please and we show your optics in the CMC mode. We'd like that zeroed at your convenience, please.

SC Auto on zero.

END OF TAPE

CAPCOM Endeavour, Pan camera power OFF, please.

SC Rog. Pan camera OFF.

CAPCOM Thank you.

CAPCOM Hello, Endeavour. This is Houston with photography pads and a TEI 73 pad when you're ready.

SC Okay, Joe. I'm ready to copy the photo pad.

CAPCOM Okay, Joe. I've got a Map camera photo pad. I've got a Pan camera pad and I've got a Terminator photo pad for you, and before I start, just a word of the explanation. Because of your change of trajectory from what we considered a nominal one, we've got some details to add to the pad that involve image motion setting changes and exposure changes. And I'll read those in detail in a moment. I just wanted to give you a word of explanation on it. The first pad is the Map camera photo pad copied at 217 plus 10 and at 217 plus 10 it is key start 218 plus 16 plus 59, key stop 219 plus 16 plus 44. Over.

SC Roger, copy. 21816 59 219 1644.

CAPCOM That's correct Jim, and if you'll turn the page now. I want you to delete 2 lines, one at 218 plus 35 and that is Map camera image motion increase talk back barber pole ON. Delete that and delete the line at 218 plus 55 which reads Map camera image motion increase talk back barber pole plus 4 steps et cetera. And instead put in the instruction at T start it should be barber pole plus 4 at 218 plus 39 plus 00 barber pole plus 3 and at 218 49 plus 00 barber pole plus 4. Read back, please.

SC Okay, the instructions are that at T start it should be barber pole plus 4, at 218 plus 39 plus 00 barber pole plus 3, and 218 plus 49 plus 00 barber pole plus 4.

CAPCOM That's correct Jim, and those are your image motion settings and you're to delete the other 2 image motion instructions in the flight plan. One at 218 35 and the other at 218 55 and I know you got that. The second -

SC Yes, I made those 2 corrections.

CAPCOM Okay, the second is a terminator photo pad to copy at 218 plus 07. And it is T start 218 plus 15 plus 19. Over.

SC 218 15 19.

CAPCOM Roger, and finally, the Pan camera photo pad. Copy at 218 plus 39 T start 218 plus 52 plus 55.

END OF TAPE

CAPCOM plus 52 plus 55. Stop 219 plus 16 plus 44, and delete the 2 pan camera exposure lines. The first one at 218 plus 57 delete that, and the second one at 219 plus 03 delete that. And instead, use these exposure instructions. At 219 plus 00 plus 13 decrease. At 219 plus 00 plus 50 normal. At 219 plus 06 plus 35 decrease. At 219 plus 07 plus 28 normal. Read back please.

SC Okay, I understand the instructions on the pan camera exposure at 219 plus 00 plus 13 decrease. 219 plus 00 plus 50 normal. 219 plus 06 plus 35 decrease. 219 plus 07 plus 28 it goes back to normal.

CAPCOM That's right Jim, and give me the T-start, and T-stop time please.

SC Okay, T-start was 218 52 55, and 219 16 44.

CAPCOM Sounds fine, and I'm holding TEI 73 pad when you're ready for that.

SC Stand by one, Joe. Okay Joe, I'm ready here for the TEI pad.

CAPCOM Roger Jim. It's TEI 73 that's PS and G&N. 36188 plus 063 plus 098. 221 47 4281 plus 288 33 minus 06613 minus 01955 179 128 350. All the rest is NA ullage 4-jett 12 seconds. Other the pad assumes no shape maneuver, and it assumes the lift off REFSMATT. Over.

SC Okay Joe. TEI 73, that read back. SPS G&N 36188 plus 063 plus 098. 221 47 4281 plus 288 33 minus 06613 minus 01955 179 128 350. 4-jett 12 seconds, assumes no shape burn and lift off REFSMATT. Over.

CAPCOM Okay Jim, right on. Thank you.

CAPCOM Endeavour, this is Houston.

SC Go ahead Joe.

CAPCOM Roger Jim. Just for your own thinking, we'd like to advise you that we have reviewed the cue card F-K1 for the plane change burn that Al copied, and it's update is still valid for your shape burn later on. We're in the process of going over your SPS thrusting procedures on G5-1 in the check list -

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/4/71, 9:40CDT, 217:06GET, 608/1

CAPCOM going over your SPS thrusting procedures, on G5-1 in the checklist and we see very - only very minor changes that we'll be coming up to you with regarding your burn later on today, so I think things are pretty well in hand down here. Over.

SC Okay, we copy. Thank you, Joe.

CAPCOM Another item regarding that, FAO wants me to urge you again just to follow the flight plan items regarding SIM bay operation before and after these burns coming up and we'll get no - we'll get into no problems at all.

SC Got that.

CAPCOM Over.

SC Rog. Understand.

PAO This is Apollo Control at 217 hours 17 minutes. Flight Dynamics Officer, Bill Stovall has just passed to Flight Director, Gene Kranz, the latest computed times for the shaping burn, and for the subsatellite jettison. These times will be updated later and they may change in the seconds, but they're very close to what the times will be. Present computation shows the shaping maneuver will be performed at 221 hours 20 minutes 49 seconds with the Delta V of approximately 66 feet per second, subsatellite jettison at 222 hours 39 minutes 34 seconds. The resulting satellite orbit is expected to be 76.5 by 55.1 nautical miles. The longitude of perilune on that orbit, 47.6 degrees west.

CAPCOM Endeavour, this is Houston. We have no problems at all as you come up on 5 minutes before LOS. Al, we do have a question for you, if this is a good time to ask it. Over.

SC Yeah, go ahead, Joe.

CAPCOM Rog. Alfredo, we're sitting down here wondering if perhaps at sometime over the past few days you've gotten a visual on the mass spectrometer boom and unit, and if so, has it been possible at all to determine which direction the mass spec might be twisting as you move through the orbit over the moon. Over.

SC Yeah. I have seen that Joe, and I've - haven't watched a great deal of twisting and as a matter of fact I was rather surprised that there wasn't more twist than what I observed. I may not have picked up the maximum deflection, but I only observed about a - maybe a 5- or 10-degree rotation of the end on the boom, and as I recall, as I was looking at it from inside the spacecraft, the rotation was counterclockwise.

CAPCOM Okay, Al. That's interesting information. We don't necessarily expect it to have rotated more, but just wondering if you had some good visual data for us and that's excellent. Another comment, and it's more in the way of a reminder, during your EVA, we're going to ask you to look very closely at the V over H sensor and the symptoms we've had concerning that sensor down here, is as though it has a small crack in the lens or perhaps there's foreign contamination of some kind down in the barrel and we're going to ask you

APOLLO 15 MISSION COMMENTARY, 8/4/71, 9:40CDT, 217:06GET, 608/2

CAPCOM to look particularly for either a crack, or contamination in the barrel during the EVA. Just wanted to lay that one on you now in case we forget that one. We'll probably remind you of it later on.

SC Roger, Joe. I understand that one.

CAPCOM Endeavour, we'd like a pro on the P20 now please.

SC Okay, that's in work, Joe.

CAPCOM Rog. Jim. Thanks.

SC Yeah.

CAPCOM And Endeavour, requesting you configure DSE now please.

SC Okay.

CAPCOM Endeavour, recall the 5018 and get the attitude please.

PAO This is Apollo Control at 217 hours 34 minutes. Endeavour has gone behind the moon on the 71st revolution and we've had loss of signal and a Lunar Surface Science Briefing is beginning now in the main MSC Auditorium.

END OF TAPE

PAO This is Apollo Control at 218 hours 59 minutes. Apollo 15 has 33 minutes remaining in acquisition during the 72nd lunar revolution. It's been a quiet pass, we've accumulated 4 minutes 27 seconds in tape during the news conference, we'll play that tape for you now.

CAPCOM Hello Endeavour, this is Houston.

CAPCOM Roger Dave. Looking downstream a little bit here. I know you'll be interested to know that both the shape burn and the satellite jett will be coming up very close to the nominal parts in your flight plan, and we've got the photo pass here when you're ready to copy, and there are only a few lines, over.

SC Okay Joe, go ahead.

CAPCOM Roger, the first is a terminator photo pad to go in at 220 plus 05 and it reads T-start 220 plus 13 plus 45. Over.

SC Roger Joe, T-starts 220 13 45.

CAPCOM Thank you Jim, and I've got a milestone for you to add here. A pan camera photo pad, with a T-start of 220 plus 15 plus 25 and the instructions on that are run the pan camera to film depletion, and your indication is talkback barber pole. That's a lot of feet of film. And finally an entry at 221 plus 59 it's an addition which reads circuit breaker 02 tank 100 W heaters 3 main B closed. Over.

SC Okay, on the last one it was 221 59 circuit breaker 02 heaters, 100 watt heaters, 3 main B closed. And then going back to the entry for a T-start time pan camera of 220 15 25 and run the camera to film depletion, and talkback barber pole.

CAPCOM Right on Jim. Thank you.

CAPCOM Endeavour, this is Houston requesting image motion to talkback plus 3.

SC It's in work right now Joe.

CAPCOM Okay, thank you, and if you give us ACCEPT, we'll update a REFSMATT to you.

CAPCOM And Endeavour, Houston again with a couple more items.

SC Go ahead, Joe.

CAPCOM Rog Jim. Coming up on our TEC partial gamma ray extension and look downstream towards that, we're requesting that you time the gamma ray boom extension, which you're going to do at 219 plus 19, and we'll be standing by for that time, and also requesting that you get on the bio-med via the flight plan please.

SC Okay.

CAPCOM And Endeavour it's your computer.

CAPCOM This is -

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/4/71 GET21904 CDT1137 610/1

CAPCOM This is Houston requesting high gain auto,
please. Endeavour, please terminate battery Bravo charge.
SC Roger. Battery GARBLE. We were charging battery
Alpha.

PAO This is Apollo Control at 219 hours, 4 minutes,
we're back live on air ground now.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 219:08 CDT 11:41 611/1

CAPCOM Endeavour, Houston. Turn the Map camera back
on, please. And it's not necessary to extend it.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 219:13 CDT 11:46 612/1

CAPCOM Endeavour, Houston. Turn the map camera back on, please. And it's not necessary to extend it.

CAPCOM Hello, Endeavour. This is Houston.

SC Go ahead.

CAPCOM Rog. troops. We'd like to tag up with you on the recommended TEI procedures and Al, I guess maybe you'll be doing this, and we're interested in reverifying the entries which you've made in your P40 SPS thrusting checklist pages G5-1 through to the end. And we've got, I guess, 2 new entries to put in, but we want to reverify the entries that you've already got in there. Your choice, if you want to read those entries to us, or if you'd like us to read them to you. Over.

SC Okay, let's get Al up on the headsets. Stand by 1, please.

CAPCOM Roger.

CAPCOM Endeavour, Houston. Requesting Pan camera power OFF, please.

SC Okay, Houston. I had a continuous (garble)

CAPCOM Roger. Copy that. That's a lot of film across those rollers.

SC Rog.

CAPCOM Endeavour, Houston.

CAPCOM Roger. A question on your pan camera. When you turned the camera off, was it already barber pole or was it grey and then went to barber pole as you threw the switch. Over.

SC It was already barber pole.

CAPCOM Okay, thank you. And we're standing by for Al on the headsets.

SC Okay, let's get on this SIM Bay stuff cleaned up first.

CAPCOM Roger.

CAPCOM And Endeavour, this is Houston. You're coming up on 8 minutes to LOS. And we'll just go over the TEI procedures on the next pass. No hurry on that at all.

SC Okay, that sounds like a good idea. And Houston, Gamma Ray Boom Deploy was 2 plus 33.

CAPCOM Say again that time please.

SC 2 minutes and 33 seconds.

CAPCOM Rog, Thank you. And Endeavour, this is Houston with instructions on the pan camera. You can start the pan camera power using the normal procedures at T start and if you get an incorrect indication you may continue as barber pole. Just leave it in the normal configuration until AOS. Over.

SC Roger. Start normally at T start (garble) barber pole and leave it till AOS.

CAPCOM That's right, thank you. And we have your torquing angles, thank you.

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 219:13 CDT 11:46 612/2

SC Roger.
CAPCOM Endeavour, you're looking good at LOS minus
60 seconds. Configure the DSE for us, please. And we see
you've done that. Thank you.

SC Roger. Just did.

PAO This is Apollo Control at 219 hours 32 minutes.
We've had loss of signal on the 72nd revolution. A briefing
on Orbital Science is scheduled for 1:00 P.M. today in the
MSC Auditorium. This Briefing will not be carried on the
Public Affairs Release Line. To repeat, the 1:00 P.M. brief-
ing on Orbital Science will not be carried on the Public
Affairs Release Line. At 219 hours 32 minutes this is
Mission Control Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 220:18 CDT 12:53 613/1

PAO This is Apollo Control at 220 hours 17 minutes. We're about to acquire Endeavour on its seventy-third lunar revolution. We'll stand by for air to ground.

CAPCOM Endeavour, this is Houston.

SC Go ahead, Houston. Endeavour.

CAPCOM Roger. Could you tell us, please, the status for the pan camera switch.

SC Roger. Right now, it's in stand by in power and it's been barber pole.

CAPCOM Okay, we copied that, Endeavour. You can go ahead and power it down. We've run through to the last of the pan camera film.

SC Roger.

CAPCOM And, 15. We've powered up the drug store, they'll receive the film when you get home.

SC Rog, better get a couple.

CAPCOM Endeavour. Our last request on that pan camera requesting power on and operate, please.

SC Roger, power on and operate.

CAPCOM Endeavour, requesting accept for your new state vector and a shaping target load.

SC Rog, you've got it.

CAPCOM Thank you.

CAPCOM Endeavour, this is Houston. We've reverified that your pan camera is out of film and you can power it down for us, please, for the final final time, over.

SC Joe, you'll have to give us that transmission again. We were off (garble) temporarily.

CAPCOM Roger, Jim. Just said that we've reverified that the pan camera is out of film and you can power it down for the final time at your convenience.

SC Understand.

CAPCOM Endeavour, we have a preliminary TEI 74 pad if you're ready to copy.

SC Stand by one, Joe.

CAPCOM Roger, Jim. No hurry.

SC Okay, Joe. Ready to copy.

CAPCOM Roger. TEI 74 preliminary. SPS G&N 35 852 plus 062 plus 096 223 48 4363 plus 29450 minus 07696 minus 01528 000 000 000. NA. Plus 00223 30477 222 30294 37 2243 305, NA NA NA. Plus 2612 minus 15798 10838 36179 294 58 40. GDC aline, Vega and Deneb. Roll aline 102 178 028. Ullage 4 jet 12 seconds. Standing by for readback, over. And the computer is yours, Endeavour.

SC Roger, Joe. Would you start with DELTA VT, again? I missed that.

CAPCOM Roge. DELTA VT is 30477, VT 222 and DELTA VC 30 294, over.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/4/71 GET22030 CDT1305 614/1

CAPCOM BT 222 and Delta VC 30 294. Over.

SC Roger. Read on down the rest of that pad, from there on down.

CAPCOM Okay, coming at you, Jim. The sextant is 37 2243 305. NA NA NA. Latitude plus 26 12. Longitude bias 157 98, 108 38 36 179 and GET 294 58 40. Vega and Deneb 102 178 028. 4 jet 12 seconds. Over.

SC Okay Joe readback for PDI 74 preliminary - SPS G&N 35852 plus 062 plus 096 223 48 4363 plus 29450 minus 07696 minus 01528. 0 for roll, pitch and yaw. Delta VT 304 77 222 3029437 2243 305. Latitude plus 2612 minus 15798 10838 36179 294 58 40. Vega and Deneb 102 178 028. 4 jet for 12 seconds.

CAPCOM That's correct Jim and you're Noun 44 is NA and plus 00223 and readback is correct.

SC Roger copied. HB is plus 00223.

CAPCOM And Jim, this is Houston. Could you adjust your S-band volume for us please. You have a side tone squeal when you transmit and the volume is fairly weak for us. Give us a count before you do it and after you do it. And, would you reverify the Delta VY for us. Over.

SC Okay Delta VY was minus 07696.

CAPCOM Okay Jim, thank you. And the volume is better. Thank you.

SC And Houston, Endeavour, we're just finishing up final stowage right now. We'll be with you in a couple of minutes on the procedures.

CAPCOM Okay we're standing by. Endeavour at your convenience gain step switch to center, please. And I have the shape SPS G&N pad when you are ready for that.

SC Okay, Joe. Gain step is center and I'm ready on the shape pad.

CAPCOM Roger, Jim. Shape SPS G&N weight 36171 plus 063 plus 098. 221 20 47 23 plus 00170 minus all zips, minus 00642 355 198 -

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/4/71, 13:11CDT, 220:36GET, 615/1

CAPCOM 355 198 010 00761 plus 00543 and Jim, why don't you read back from there and I'll pick up again. Over.

SC Okay. It's the shape SPS G&N 36171 plus 063 plus 098 221 20 4723 plus 00170 minus all zips minus 00642 355 198 010 00761 plus 00543.

CAPCOM Right on, Jim. Delta VT is 00664 003 00 548 sextant 13 1643 126 001 down 091 left 46 the rest is NA. GDC aline Vega and Deneb, roll aline 102 178 028, 4 jet, 12 seconds. Other is subsat launch GET 222 plus 39 plus 27, roll 266 pitch 141 yaw 038, high gain pitch minus 70 yaw plus 113. Standing by for readback starting with Delta VT. Over.

SC Okay, Joe. 00664 003 00548 13 1643 126 001 down 091 left 46, Vega and Deneb, 102 178 028, 4 jet, 12 seconds, subsatellite launch GET 222 39 27, roll 266, pitch 141 yaw 038, high gain is pitch minus 70, yaw plus 113. Over.

CAPCOM Right on the money. Thank you sir.

CAPCOM And, Jim, I guess those high gain angles are to be applied to the shaping maneuver, not the subsat launch.

SC Okay.

SC And Houston, we're ready to talk about our procedures any time you are now.

CAPCOM Okay, Endeavour, I guess we're ready to start. I want to put one final note on the subsat launch. We'd like for you to reverify for us the talkbacks on the RCS after the launch.

SC Okay. Understand. Check the RCS talkbacks after the launch. We'll do that.

CAPCOM Okay, Dave, and I guess you might cast an eye up at the fuel cell talkbacks as well. Over.

CAPCOM Endeavour this is Houston --

END OF TAPE

CAPCOM talkbacks as well, over.

CAPCOM Endeavour, this is Houston, ready to tag up with you on the TEI procedures, and Dave I guess we're standing by for your recommendation. Do you want to read through the additions you now have in your P40 SPS thrusting check list, or do you want us to go through the changes we want you to have there. It looks pretty much exactly like your TLI maneuver. There are just 2 changes, there 2 difference from that I guess, over.

SC Okay, why don't you give us the 2 differences and then we'll read it all back to you to make sure we've got it straight.

CAPCOM Okay Dave. That sounds like a good way. Turn to page G5-4, and right down at the bottom of the page -

SC 5-4 go.

CAPCOM Rog, right at the bottom of the page after the 2 lines SPS fuel oxidize pressure and pugs balanced add the step cut off minus 10 seconds circuit breaker SPS pilot valve main A to open.

SC Okay, bottom line on page 5-4, cut off minus 10 seconds circuit breaker SPS pilot valve main A open.

CAPCOM That's correct, and turning over a page to 5-5, you have an addition underneath the normal step which reads circuit breaker SPS pitch 1 and yaw 1 to open, your addition reads circuit breaker SPS pilot valve main B open and we have still another step to add in there, which is circuit breaker EMS 2 of them main A and main B to open, and also we would like to delete 1 step below that, the 3 lines map camera on to off, pan camera power to off, and Sim AC power to off, over.

SC Okay, on page 5-5, beneath the addition of CB SPS power valve main B open, add CB EMS 2 open and delete the 3 lines on map camera pan camera SIM AC power below that.

CAPCOM That's correct Dave and we're standing by for the other additions you've made now.

SC Okay, we'll go back to the beginning here. Okay, our initial configuration has the addition of both pilot valve circuit breakers open, and to verify that both EPS group 5 circuit breakers are closed, and also on page 5-1, beneath the caution warning test EMS function off to verify, and the CB EMS A&B both closed. That's what we have on 5-1.

CAPCOM Okay, that's good. Turn the page.

SC Okay, on 5-2 under TBC check and prep second line CB SPS 10 closed. That's all on 5-2.

CAPCOM Roger.

SC Page 5-3 at minus 2 minutes CB SPS pilot valve main B closed instead of Delta V thrust A&B normal.

CAPCOM That is correct.

SC And on page 5-4 at 5 minutes prior to ignition when we get 5 seconds prior to ignition when we get the flashing 99 we Delta V thrust A&B to normal after the pro, and then on down at ignition, if we have a flashing 97 the SPS thrust valve CB SPS power valve A closed, and if everything goes according to Hoyle, why at 5 seconds we'll close the CB SPS power valve on main A, and then of course the step you just answered, just added at the bottom of the page at cut off minus 10 seconds to close the pilot valve, or to open the pilot valve main A.

CAPCOM Okay Dave, that's right on the money.

SC Okay, then on 5-5, we just discussed those 2 which were a CB SPS power valve main B open and EMS circuit breakers open.

CAPCOM Roger Dave. That sounds good to us.

end of tape

SC 10 seconds to close the pilot valve - to open the pilot valve main A.

CAPCOM Okay, Dave. That's right on the money.

SC Okay, and then on 5-5, we just discussed those 2, which were A CB SP pilot valve main B open and EMS circuit breakers open.

CAPCOM Roger, Dave. That sounds good to us.

SC Okay, and I think we've practiced one of those once before. I think we'll be able to handle that.

CAPCOM Dave, just out of curiosity, we know you or Al marked up the cue card for the plane change maneuver and we wonder if you're going to use that marked up card for the shape burn. Over.

SC No, we'll use the checklist straight through on the rest of the burns.

CAPCOM Okay, Dave. That's fine with us. We know you're aware it's a single bank B burn which has been marked correctly under that cue card.

SC Rog. Yeah I guess all our burns in orbit are just a straight single bank B.

CAPCOM Right on. Thank you.

SC And coming out we'll have the ball valves open and all the eyeballs watching.

CAPCOM Sounds like a good idea.

PAO This is Apollo Control at 220 hours 48 minutes. We're about 32 minutes away from that shaping burn. This burn is required to give a proper lifetime for this subsatellite. We'd like at least a years lifetime for that subsatellite. In the present orbit of 65.4 by 52.2 nautical miles, the subsatellite would have a lifetime of approximately 80 days. Going into this changed orbit, will give it a lifetime of at least a year. We've passed up the pad for that maneuver, ignition time at 221 hours 20 minutes 47.23 seconds, delta V of 66.4 feet per second, a burn time of 3 seconds, resultant orbit 76.1 by 54.3 nautical miles. We've also passed up the pad for the jettison. Time for that 222 hours 39 minutes 27 seconds. And we've passed up a preliminary transearth injection pad. A final pad will be passed up later. This preliminary pad shows TEI ignition at 223 hours 48 minutes 43.63 seconds, delta V of 3047.7 feet per second. Duration of the burn 2.2 minutes 22 seconds, burn duration 2 minutes 22 seconds.

PAO This is Apollo Control at 220 hours 51 minutes. This shaping burn will be performed about 10 minutes prior to loss of signal on this 73rd revolution. The sub-satellite jettison will be performed while we have acquisition of Endeavour on the 74th revolution.

CAPCOM Go ahead.

SC We were just getting the hoses set up here for the burn and noticed that there's a little bit of water coming out of the blue hose in the suit loop. Thought you might be interested.

CAPCOM Okay, Dave. We copy that. Thank you.

SC Roger. Not much. It's just if you put your hand around the nozzle there -

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CAPCOM : Okay, Dave. We copy that. Thank you.

SC Roger. Not much, it's just if you put your hand around the nozzle there, why you can get some water on it.

CAPCOM Okay, we copy that. We think it's probably normal, but we'll look into it real closely. Sounds to me like the Endeavour has a few plumbers aboard as well as experts in other things.

SC Well, by the time this is over, I guess we will be plumbers.

CAPCOM We'll all be plumbers, Davey.

PAO This is Apollo Control at 221 hours 4 minutes. Endeavour is maneuvering to the burn attitude now. We're 16-1/2 minutes away from ignition - 5 minutes from ignition.

CAPCOM Endeavour, you're looking good. You're GO for the shaping burn.

SC Rog. GO for the shape.

PAO 1 minute. Ignition. Cut off.

SC Okay, Houston. Endeavour with a burn status report.

CAPCOM Go ahead, Endeavour.

SC Okay, burn was on time and it was a 3 second burn. We had about 1.0 or about 1.1 residual. And that was trimmed to .1 minus .2 minus .2. Delta vc was minus 11.0 fuel to 6.40, oxidizer to 6.25.

CAPCOM Roger, Dave. We copy that.

SC And it has us in an orbit 76.0 by 54.3.

CAPCOM Sounds just right.

SC And a very smooth burn.

CAPCOM Okay, Dave. Great. And you just gained about 240 more days for our sub-satellite or something like that.

SC Very good.

CAPCOM Endeavour, this is Houston. You're looking good at LOS minus 5. And I have a reminder on your water dump. We'd like you to monitor it down to 10 percent. And we'll see you on the other side. Over.

SC Rog. Understand. Will do.

CAPCOM Endeavour, this is Houston. And we've copied your torquing angles.

SC Roger. Thank you.

PAO This is Apollo Control at 221 hours 30 minutes. We've had loss of signal on the 73rd revolution. The shaping burn performed a few minutes ago has achieved the desired results giving the - will give the sub-satellite at least a years lifetime in lunar orbit. The onboard orbital reading after that burn 76 by 54.3 nautical miles. The next event will occur while we are in acquisition on the 74th revolution. That will be the jettisoning of the sub-satellite at 222 hours 39 minutes 27 seconds. We'll join the Orbital Science Briefing on this line now.

END OF TAPE

PAO This is Apollo control at 222 hours 15 minutes. We're about to acquire Endeavour on the 74th revolution. During this pass the subsatellite jettison is scheduled, and on this 74th revolution after Endeavour goes behind the moon the transearth injection burn will be performed. We will not be in contact at that time. The subsatellite will be jettisoned at the time the spacecraft is crossing the lunar equator on its way to apolune. Will be jettisoned to the north so that the spin axis will be perpendicular to the sun's line of sight and allow maximum sunlight on the solar cell. The spring ejection mechanism will give the subsatellite Delta-V of 4 feet per second relative to the spacecraft. And the initial spin rate on the subsatellite will be 140 revolutions per minute. That's expected to stabilize out at 12 revolutions per minute when the booms are extended. We'll stand by for air ground.

CAPCOM Hello, Endeavour. This is Houston.

SC Houston, Endeavour, go.

CAPCOM Roger Endeavour. We're requesting you verify your systems - data systems on and the S-band ox switch to science, please.

SC Okay, that verified, now. The data systems are on now.

CAPCOM Okay, Dave, we copy that. I've got a map update rev 75 when you're ready to copy. And I have a message for Al from the King when he's ready to copy.

SC Go ahead, Joe.

CAPCOM Rog, Al. The message to you is to stand by to copy your final exam period in orbital science and observations. It's an alpha plus with a subnote of well done, over.

SC Tell the King, thank you very much, Joe.

CAPCOM Rog, Al, and I've got the map - -

SC And I expect to see him back in Houston, too.

CAPCOM Oh, no problem there.

SC Go ahead, Joe.

CAPCOM - - the map update rev 75. Copy at 223 plus 20. And it is LOS 223 plus 29 plus 45. 180 223 plus 52 plus 57. AOS with TEI, 224 plus 03 plus 03. AOS without TEI 224 plus 15 plus 30. Over.

SC Okay, map update readback for rev 75. 223 29 45, 223 52 57, 224 03 03 and 224 15 3 - -

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 220:20 CDT 14:54 MC620/1

SC 235 25 7 224 03 03 224 15 30.

CAPCOM Readback is correct, Jim, thank you.

PAO This is Apollo Control at 222 hours 23 minutes.

That message with the grades and the congratulations for Al Worden was from Farouk El-Baz, one of the crew's instructors in Geology.

CAPCOM Endeavour, we verify your SIM pyro bus arm, and your rates look good to us down here. Over.

SC Okay, you had us all figured out. We'll go free.

CAPCOM Rog, Dave. And we know one of you will be watching out the window, we're particularly interested if the spin of the satellite is sweeping out of cone or if it seems to be a fairly flat spin as it comes out. Over.

SC Roger.

CAPCOM Endeavour, we are requesting you go back to auto and do another verb 49, please. We see you drifted off about a degree.

SC In work.

PAO We're 5 minutes away from sub-satellite jettison.

CAPCOM Okay Endeavour, we're recommending that you go back to three at launch minus one minute.

SC Okay, three at launch minus one minute.

CAPCOM Endeavour, we got a new update to the last instructions. Go three at launch please.

SC Rog, three at launch.

PAO Spacecraft rates look good at one minute 30 seconds.

SC Three, two, one, launch. We have a barber pole, and a gray.

CAPCOM We confirm that.

SC Tally Ho!

CAPCOM Okay, Dave, copy. That sounds great. Can you see much?

SC Oh, looks like it might be oscillating maybe 10 degrees at the most.

CAPCOM Roger, Dave, copy. And Endeavour, when you are ready, I've got a coming home pad to read to you.

SC Stand by one, Joe.

CAPCOM Okay Jim, and we would like ACCEPT please, on the computer.

SC Stand by one. A very pretty satellite out there, we get about 2 flashes per rev off each boom, and it seems to be rotating quite well. Very stable.

CAPCOM Very good Dave. Thank you.

SC And Joe, I'm ready to copy that coming home pad.

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 220:20 CDT 14:54 MC620/2

CAPCOM Okay Jim, I'm ready to read it to you. Its
TEI-74-SPS G&N, the weight 35768 plus 057 plus 088 223 48
4505 plus 29452 minus 07613 minus 01714, all zips on roll
pitch and yaw. NOUN 44 is NA, and plus 00221 30

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 22244 CDT 1518 621/1

CAPCOM - - 4 is na and plus 00221 30468 221 30285
372243 305 053 down 103 right 31 plus 2611 minus 15797 10841
36179 and the GET 294 58 34 GDC aline Vega and Deneb 102 178
028. 4 jet 12 second ullage and we'd like accept, please. And
I'm standing by for the read back. Over.

SC Okay, you have accept and here's the read back,
Joe. TEI 74 SPS G&N 35768 plus 057 plus 088 223 484505 plus
29452 minus 07613 minus 01714. All zips for roll, pitch and
yaw. HP plus 00221 30468221 3028537 2243 305053 down 103
right 31 plus 2611 minus 15797 10841 36179 294 58 34 Vega
and Deneb 102 178 028 4 jet for 12 second.

CAPCOM Okay, Jim the read back is right on. I've
got a TEI-75 preliminary pad and a flight plan update pad,
when your ready.

SC Okay, I'll take TEI 75.

CAPCOM Okay. SPS G&N TEI 75. 35768 plus 057 plus
088 225 48 4408 plus 29814 minus 08072 minus 01451 000 002
001 all the rest na ullage 4 jet 12 seconds. Over.

SC Roger, TEI 75 SPS G&N. 35768 plus 057 plus
088 225 48 4408 plus 29814 minus 08072 minus 01451 000 002
001 4 jet for 12 seconds.

CAPCOM Sounds good, Jim. Thank you. And I'm standing
by for your call for the flight plan update.

SC Go ahead, Joe, I'll take that.

CAPCOM Okay, Jim and it's your computer. The - -

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 222:50 CDT 15:24 MC622/1

SC Go ahead Joe, I'll take that.

CAPCOM Okay Jim, it's your computer. The Flight Plan update begins at 223 plus 51 and change the verb 49 maneuver from the numbers listed to the numbers 127 270 030. Over.

SC Read you. The verb 49 occurs at 223 51, change the numbers to 127 270 030.

CAPCOM That's correct and the next entry is at 224 plus 00. Change the line "OMNI delta" to read "OMNI charley", and I have a map camera photo pad to be copied at 224 plus 10. The T start 224 plus 03 plus 00. T stop MSFN cue. The next entry is listed at 224 plus 15 and change the map camera image motion requirements to read talk back to barber pole plus 2 steps flash OFF and then I have 3 deletions at 224 plus 21 delete the verb 49, at 224 plus 23 delete map camera track, retract, and 224 plus 27 delete map camera laser experiment covers closed, and the last item is an addition at 224 plus 40 add "Verb 49 maneuver 127 295 and yaw is 030" and the high gain antenna pitch 23 yaw 229. Over.

SC Okay Joe, going back to 224 00, it will be OMNI Charley instead of OMNI Dona, then on map camera photo pad its 224 03 00 and stop on MSFN cue, then down to 224 15, on the map camera image motion will be barber pole plus 2 instead of 3 at 224 21, we'll delete the verb 49 maneuver and at 224 23 we'll delete the map camera track at 224 27 delete map camera laser experiment covers closed and at 224 40 do a Verb 49 maneuver to 127 295 030, high gain, pitch 23 yaw 229.

CAPCOM Right on, Jim, thank you.

PAO This is Apollo Control at 222 hours 53 minutes. We've passed up the final maneuver pad for the transearth injection burn behind the moon on this revolution to bring Endeavour and its crew home. Ignition time 223 hours 48 minutes 45.05 seconds. Delta V, change in velocity of 3,046.8 feet per second, duration of the burn 2 minutes 21 seconds.

END OF TAPE

PAO This is Apollo Control, acquisition time, given a good TEI burn will be 224 hours 3 minutes 3 seconds, acquisition time, if there is not a good burn will be 224 hours 15 minutes 30 seconds. Apollo Control at 222 hours 56 minutes, the canary island tracking station reports it has acquired the satellite that was ejected by the Endeavour.

CAPCOM Tracking stations have acquired the satellite.

SC Oh, very good.

CAPCOM Apollo 15, Houston.

SC Go ahead.

CAPCOM Roger, Jim, this is a comment for you. When I was reading the flight plan update to you, we noticed that you might be coming up on something not too clear in the flight plan and it involves the long list of steps between 224 plus 00 and 224 plus about 15, and there are a number of steps in there that have to be accomplished before the T start time on the map camera photo pad. It may be you'll want to start on a few of them, I guess a little early, over.

SC Okay, thank you Joe.

CAPCOM Endeavour, this is Houston, we'll be requesting omni delta when you loose the uplink.

SC Rog, omni delta.

PAO And Endeavour is maneuvering to the burn attitude now.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/4/71 22307 GET 1540 CDT 624/1

CAPCOM Hello Endeavour, this is Houston.

SC Houston, Endeavour, go.

CAPCOM Roger, Endeavour, I have 3 requests for you. The first, the optics is in the CMC mode and we noticed that drifting off, we'd like you to drive it manually back to a value less than 10 degrees in trunion and then zero it. We're also waiting for a DAP load and a P40 and I have a guaranteed last correction to your flight plan when you're ready.

SC Okay, number 1, we've still got to make the star check and we'll take care of that and I hope you won't change the DAP load and the P40, but we'll take a look at it again for you.

SC Okay, Joe, all right, we're ready to take that last issue in the flight plan.

CAPCOM Okay, Jim, stand by 1. Okay, Jimmy, this is an easy one: at 224 plus 14, we want you to delete the line that reads map camera image motion to ON talkback barberpole increase 5 seconds then gray, delete that line please. Over.

SC Okay, that's an easy one, we'll delete that line - map camera image motion ON talkback barberpole increase 5 seconds then gray.

CAPCOM Rog, Jim, thank you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 1554 CDT 22321 625/1

CAPCOM Hello, Endeavour, this is Houston.
SC Okay, Houston Endeavour, go.
CAPCOM Roger, Dave, Al and Jim. Be advised you are
go for transearth injection. Set your sails for home we're
predicting good weather, a strong tail wind and we'll be
waiting on the docks. Over.
SC Okay, thank you very much, Houston. We'll see
you around the corner.
CAPCOM Rog, we'll be watching.
PAO This is Apollo control at 223 hours 24 minutes.
We're 5 minutes away from loss of signal. 23 minutes 53 sec-
onds from ignition on TEI.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 223:27 CDT 16:00 MC626/1

PAO This is Apollo Control at 223 hours 29 minutes.
We've had loss of signal. Endeavour is 18 minutes 48 seconds
away from transearth injection. The entire backup crew is
at the Capcom console here in the control center as is the
Director of Flight Crew Operations, Donald K. Slayton and
his deputy, Colonel Tom Stafford. We'll come back up
several minutes prior to acquisition time. At 223 hours
30 minutes, this is Mission Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 224:01 CDT 16:35 MC627/1

PAO This is Apollo Control at 224 hours 1 minute. We are now about 2 minutes away reacquiring radio contact with Endeavour, assuming the transearth injection burn went as planned. That 2 minute and 21 second burn with the service propulsion system engine was targeting to increase the spacecraft's velocity by 3,046.8 feet per second and would give us a splashdown in the Pacific Ocean about 285 miles north of Hawaii at 295 hours 11 minutes 35 seconds. We are about 1 minute now from a scheduled acquisition time. We are about 30 seconds from our expected acquisition time and the spacecraft velocity at this point should be about 7,500 feet per second. We do expect that the communications will be noisy, now when we do regain radio contact, the spacecraft will be using the small OMNI antenna and it'll be about 30 minutes before we have the high gain antenna up which will give us the stronger signal strength and we do have acquisition of signal.

CAPCOM Apollo 15, Houston. Over.

SC Hello Houston, Endeavour is on the way home with a burn status report for you.

CAPCOM Roger, sounds good, standing by.

SC Roger, ignition was on time, burn time was 2 plus 21, no trim, residuals were minus .2 plus .6 and plus .2. Delta VC was minus 16.7, fuel 2.35, oxidizer 2.2, imbalance was about minus 25 and what a smooth burn that one was.

CAPCOM Roger, sounds very good to us, Dave.

SC Just can't beat these rocket engines for traveling.

CAPCOM Should hope not.

PAO That was Dave Scott passing the burn report back to Capcom Bob Parker and Scott reported the burn almost precisely as planned, burn time 2 minutes 21 seconds and other residuals so low that he did not even have to trim them. This Apollo Control as a result of what appeared to be a near perfect transearth injection burn, we predict that the impact point and splashdown time will be as predicted. Again the splashdown location is about 285 miles north of Hawaii, the targeted coordinates are 157 degrees 58 minutes west, 26 degrees 7 minutes north and the predicted splashdown time is 295 hours 11 minutes 35 seconds. There will be several opportunities for mid-course correction on the route home, those will be primarily for corridor control, to put the spacecraft in the proper entry corridor changing the flight path angle is required to get that proper entry angle. There will be a change of shift press briefing. It will be in the briefing room, the MSC News Center briefing room and

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 224:01 CDT 16:35 MC627/2

PAO we expect that that will begin in about 15 minutes at about 5:00 PM Houston time.

END OF TAPE

PAO This is Apollo Control. Now 27 minutes after performing that transearth burn, after Apollo 15 is about 940 nautical miles above the moon. And the spacecraft velocity dropping off rapidly, we're down now to 6500 feet per second from approximately 8500 feet per second velocity after the burn was performed. The flight activities officer reported that the crew should have a good view of the moon out of their spacecraft windows and we recall from the television transmission that we got during this portion of the flight I believe it was on Apollo 10 they should have a very spectacular view of the lunar surface receding rapidly below them.

CAPCOM Apollo 15, Houston. Over.

SC Houston, 15. Go.

CAPCOM Roger. Two questions, one we notice you have AC rolls jets selected, I guess we aren't sure whether you have B - AC roll jets selected on DAC, we aren't sure whether you have AC or BD selected on the panel.

SC Okay, I'll check in a moment.

CAPCOM Okay, and could we pry out of you guys any comments on the moon as you leave?

SC Well, we're almost speechless looking at the thing, it's amazing. Looks like we're going straight up and we're leaving there's no doubt about that. And we're right on the terminator, it shows very distinctly all the topography, all the topographic highs and lows, and we can see some major rilles and we noticed one large lava filling within a depression with domes very prominent within the lava fill. Just really spectacular. We have one crater almost below us that has a flat floor with radial rills and circumferential rilles extending from the central peaks, I think we saw that as we flew over.

CAPCOM Roger, copy. Sounds beautiful.

SC It's really spectacular, the elevation and the topography on the ridge line is quite clear and, of course, all the features near the terminator stand out quite well because of the shadows and we're busily taking pictures so maybe we can bring some of it back for you to see.

CAPCOM Be looking for it in three or four days.

SC Rog. It's really spectacular though and there's no question that we're leaving. As a matter of fact the first glimpse we got was quite obvious that we're on the way.

CAPCOM That's a pretty good view after all those days of going around and around, isn't it Dave?

SC Yeah, boy. Looks like we're going straight out, Dick.

CAPCOM Yep, reminiscing for me, thank you.

SC Well, I'll tell you, we never got to see half of what we passed over I'm sure, because there's just so much up there.

CAPCOM Well, I'll tell you, Dave, I'm not so sure you guys didn't get at least your share, maybe a little more. Spectacular.

SC Rog.

PAO That was Dick Gordon reminiscing with Dave Scott there. Gordon was backup commander for Apollo 15 and also was - -

SC Our orbital geologist up here just figured out which way we were, I guess we were sort of momentarily disoriented there, because south is up and we're looking right up and down the terminator so I guess we're upside down looking at new territory that we haven't seen during the flight. Jim just said gee maybe I'll look out my window and by golly on his window he's looking up to the north. As a matter of fact that at window number 5 you can get a small half - half moon view. And you can see it all in one big gulp and boy what a gulp.

PAO Endeavour's 1300 miles from the moon now.

CAPCOM We'll look at Tycho now before too long.

SC That's a good point, we can't see it yet.

SC Houston, 15.

CAPCOM Go ahead, 15.

SC Okay Bob, I'm looking from Humboldt straight south now and in fact you can draw a line between Humboldt and the - and a great ditch or scarp to the south, and there's quite a change in the light level or the intensity of the albedo in between those two areas and it looks like there's some - you know - very smooth fresh lava flows throughout that area. In fact we noticed that while we were in orbit also that in several of those areas around Humboldt there, and to the north of Humboldt and to the east of Humboldt, that the flows in some of the craters there - and they're quite distinct flows, you can see where they've lapped up against the side and you can also see where they've spilled down on the sides, sort of reminiscent of the Coca Hills flow. You can - we looked at these flows and realized that they looked fresh and yet they had a lot more - the crater count was a lot higher on them than it was on the surrounding terrain. And this flow we're looking at now kind of looks - it's a very large area and it looks like it's just sort of seeped into some craters down there, some of the large craters. It looks much fresher in color. It hasn't, it doesn't look like it's been worked up as much. The craters that depict the lava flow are much sharper than they are - say further to the east. But the count seems to be much higher, the crater count seems to be much higher.

CAPCOM Copy, Al, very interesting.

SC And, Houston, 15, as we leave and look back, why, I guess we still have the impression the moon is mostly gray. However, when you're upsun as we were just prior to TEI, when you're looking upsun, it does definitely take on a chocolate brown color. We came around prior to TPI on the day side, or TEI on the day side, looking backwards into the sun across Schroter's Valley and that was a pretty spectacular sight. And it did start turning a chocolate brown but now everything is a variation of gray, very light to a gun-metal gray near the terminator.

CAPCOM Well, is that a unanimous vote in the spacecraft, Dave?

SC Rog, I got three ayes on that one.

CAPCOM Rog, we'll add that and continue to keep the score.

SC Good.

CAPCOM Some day I'll get up there.

SC Hey, Bob, we don't report to you the other kind.

CAPCOM Some day I'll get up there and make my report.

SC I hope so. We can see a point on the terminator now where we mentioned. We saw a lava filling and some domes in a depression which is not the circular crater-like depression, it's a big cavity. And now, I guess as the sun angle has changed some we can see where the lava has apparently spilled over a scarp into a deeper cavity which is in shadow. And it's very clearly a filling of the cavity with two levels.

CAPCOM Roger, Dave, we call that a polye, don't we?

SC Well, I guess if we were in Hawaii.

CAPCOM You guys don't see any motion of that stuff, do you?

SC Stand by, we'll watch it.

MOCR FP1, FAO, there's a possibility that -

SC And, Houston, 15, we got another unanimous vote up here. It was really a great trip.

CAPCOM Roger, I think that's unanimous on everyone, isn't it?

SC Rog.

CAPCOM And, 15, if you'll give us accept, we'll uplink a REFSMMAT for desired orientation PTC.

SC Roger, you've got it.

CAPCOM And, 15, it's your computer again.

SC Roger, Houston.

PAO This is Apollo Control. Most of that vivid description of the lunar surface came from Dave Scott. Al Worden also interjected some comments about what appeared to be distinct fresh lava flows near the Crater Humboldt.

APOLLO 15 MISSION COMMENTARY 8/04/71 22430 GET 1704 CDT MC629/2

PAO During the description, the spacecraft was at an altitude that began at about 1200 miles from the moon and when most of the description was finished, they were about 1700 miles from the moon. Our change of shift press briefing is ready to begin at this time MSC News Center briefing room. During the briefing, we'll record any conversations with the astronauts for playback immediately following the briefing. At 224 hours, 42 minutes, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control at 224 hours 53 minutes. Apollo 15 now about 27 hundred miles from the moon, and during the change of shift press briefing, we had 1 or 2 very brief exchanges with Dave Scott aboard the spacecraft. We'll play that for you now.

CAPCOM And Apollo 15, Houston. We'd like that verb 49 maneuver, so we can pick up high gain please.

SC We just did it, Bob.

CAPCOM Thank you.

SC Hey Houston, take a look at the DSKY. I think those are the numbers you gave us.

CAPCOM Roger 15, those are the numbers. Looks good, thank you. And 15, Houston, we'd like gamma ray gain step on, up 3 clicks, over.

SC Okay, gain step on up three clicks.

CAPCOM Apollo 15, Houston.

SC Go ahead, Bob.

CAPCOM Roger, we'd like to move that verb 49 maneuver to lunar surface photo attitude. You'll find it 225 30 in the flight plan. We'd like to move that up to 225 24, over.

SC Roger understand, move the verb 49 maneuver to 225 24.

CAPCOM Roger. Apollo 15, Houston.

SC Houston, 15, go.

CAPCOM Roger, be advised we'll be monitoring your maneuver here in case you get in your gimbal lock, and the high gain angles in case you loose antenna lock and the new attitude will be pitch minus 45 and yaw of 024, over.

SC Rog, understand pitch minus 45 and yaw 024, as we move it, and thanks for watching it for us Bobby.

CAPCOM And 15, if one of you has time, I have a few more flight plan updates for you.

SC Okay, Houston, stand by 1. Go ahead Bob.

CAPCOM Okay, the pitch and yaw angles for the P52 attitude at 22600 is, pitch of minus 37, yaw of 322.

SC Understand at the P52 attitude, it's pitch minus 37, yaw 322.

CAPCOM Roger.

CAPCOM At 22615, we're changing that verb 49 maneuver attitude to the following coordinates, 327, 143, 055.

SC Roger, copy the change to the verb 49 maneuver that occurs at 226 15 to 327 143 and 055.

APOLLO 15 MISSION COMMENTARY 8/4/71 CST1727 GET224:53 630/2

CAPCOM Roger, and the high gain angles will
be pitch 13, yaw 212.
SC Roger, pitch 13, yaw 212.
CAPCOM Roger, stand by. And 15, we're observing
yaw of 61 degrees right now. 15, Houston, we have 65 degrees
yaw.
SC Rog, Bob, we're watching.
CAPCOM Okay, 2 more flight plan updates Jim,
if you're ready.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/04/71 22529 GET 1803 CDT MC631/1

SC Go ahead, Bob.
CAPCOM Okay, at 226:22, there'll be a line above
the line that says X-ray on, the new line that's will be
added will be X-ray off for 1 second, then. Over.
SC Read that, a new line added above X-ray
on and it'll read X-ray off 1 second then.
CAPCOM Roger, that's good. At 227:32, we'll add
a line on top of the verb 48 line that says X-ray standby.
SC Roger, understand, 227:32 X-ray to standby.
CAPCOM Roger, and at 227:57 on a line with the
mass spec on it, we'll change that Discriminator-High to
Discriminator-Low.
SC Understand discriminator-low to discriminator-
high.
CAPCOM Now that completes the update for now.
SC Roger.
PAO This is Apollo Control at 225 hours, 38
minutes; Apollo 15 now 4745 nautical miles from the moon;
the spacecraft velocity almost matching the altitude 4700
feet per second. And at the present time, the crew aboard
Endeavour are photographing the lunar surface. At the same
time, the instruments in Scientific Instrument Module bay,
the gamma-ray, alpha particle, and mass spectrometer are
gathering background data to be used in calibrating the
data gathered in lunar orbit. A little later this evening,
the crew will be turning on the X-ray instrument in the
SIM-bay and that will looking at extra galactic X-ray
source in the constellation Centaurus. We plan to put the
crew to bed in a little less than two and a half hours,
now at 228 hours. At 225 hours, 39 minutes, this is
Apollo Control, Houston.

END OF TAPE

CAPCOM Okay, Davie, first of all no problem, we can delay those UV photos till after the EVA, second, right now midcourse 5 looks like 2 feet per second and we do want to do it. Over.

SC Okay, thank you, Ed. Couple of quick answers appreciate it. That will help us in our planning.

CAPCOM Okay, that is only a preliminary estimate on that midcourse 5 though.

SC That's okay, that tells us the difference between (garble) those kind of burns.

CAPCOM Oh, rog.

CAPCOM 15, Houston. One more thing if it's convenient.

SPEAKER Standby a moment, FAO.

SC Go ahead, Bob.

CAPCOM Okay, at your convenience we'd like to verify or check the primary accumulative fill valve on the primary accumulative point B (garble) glycol is up to 50 to 55 percent. This is (garble) a review of the EVA checklist for tomorrow (garble) as soon as (garble) check and that we're at 50 to 55 percent level we'll (garble) this check (garble) do it tonight when (garble) get to sleep.

SC Okay, we'll do it right now. Planning ahead. Copy.

SC Okay, Houston. Our prime accumulated quantity is now about at 5 1 percent.

CAPCOM Rog, we copy, thank you.

SC And we filled it from about 45.

CAPCOM Thank you.

SC And if you have any other goodies you think we ought to check over, might as well do it this evening.

CAPCOM Rog, Dave. (garble)

CAPCOM Okay, 15. That's the only goodie we had for the review of the EVA checklist for tomorrow. That's the only one we could find. An extra goodie that we'd like this evening (garble) you fellows intend to use the (garble). Give us a cue when you turn it on so we can check and watch the (garble). They saw a (garble) on a AC bus, or an extra current load on an AC bus when they think you were using the vacuum cleaner they'd like to verify that by watching it again when you use the vacuum cleaner.

SC Okay, well we've been using it quite often on and off.

CAPCOM Okay, just sometime when you use it if you give us a cue when you turn it on and it would help.

SC Okay, I guess we don't see any need for it this evening. We could check it out if you'd like.

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 225:46 CDT 18:21 632/2

CAPCOM No, no.

SC Well, the camera's nice and clean and I -

CAPCOM (garble) Dave, that's just a call out the next time you happen to get around to feeling dirty and want to use the vacuum cleaner, give us a call if you would please.

SC Okay, we'll do it.

PAO This is Apollo Control. The UV photography which Dave Scott requested we reschedule is the Ultraviolet photography in this case of earth using the electric Hasselblad camera. This is an experiment being conducted to obtain ultraviolet photographs of both the earth and the moon to be used in study of planetary atmospheres among other things. And Scott mentioned that the equipment for that photography is stowed under the rock boxes they've already gotten the cabin apparently set up for the EVA and requested that we reschedule it at some point after EVA when Al Worden will be going outside the spacecraft to retrieve the camera magazines from the SIM Bay. And on taking a look at the flight plan and we reported to the crew there'd be no problem - would be no problem in rescheduling this sometime after the EVA. CAPCOM Bob Parker also asked that the crew at the next opportunity when they have the vacuum cleaner out to clean up the cabin that they give us a cue. We're interested in watching the data here on the ground, the electrical data and seeing if some current flows that we've noticed previously from the spacecraft fluctuate as we've seen them fluctuate and we suspect that the fluctuations we've seen are caused by turning the vacuum cleaner on and off. We'd like to get a cue from the crew the next time they use the vacuum cleaner to see if in fact this is the case. At the present time Apollo 15 is 5,519 nautical miles from the moon. And as the altitude from the moon increases the velocity continues to drop off, down now to 4571 feet per second.

END OF TAPE

SC Houston, 15. Did you get the P52 numbers?
CAPCOM Roger, we have all your P52 numbers Al. Al,
we noted one of them was 'nt 5 Balls.
SC Say again.
CAPCOM Rog, we noted one of those didn't have 5
balls on it.
SC Rog, did you get the torquing angles on both
the P52's.
CAPCOM Rog, we got them.
SC Okay, thank you.
PAO This is Apollo Control. At the present time
Al Worden is completing a platform alignment for Program 52.
He's aligning the platform to a new set of coordinates pro-
vided by the ground and these coordinates will be used as
an attitude reference by the . . .
CAPCOM Endeavour, Houston. Over.
CAPCOM Endeavour, Houston. Over.
SC Go ahead, Houston, this is Endeavour.
CAPCOM Rog, if one of you guys have time, we have
what may or may not be the last iteration on troubleshooting
the pan camera this afternoon. Over.
SC Okay, have at it.
CAPCOM Okay, step one, we'd like to know, and you
can give us these afterwards, but the first step is to
determine the status of the service module sector one AC 2,
circuit breakers on panel 181, those are three circuit
breakers. Number two is to determine the status of the
pan camera mode switch. Number 3 after these have been
done, pan camera mode standby, power on, talk back barber
pole for 2 seconds, then gray, and then stereo. Number 4,
pan camera mode operate, talk back barber pole, 2 seconds,
then gray. Number 5 operate pan camera unless MSFN
ques, or until beginning of the sleep period. And number 6,
on MSFN que, pan camera mode to stand by, after one minute
pan camera power off. Over.
SC Okay, Bob, you clip the first part of number
5, say again please.
CAPCOM Roger, number 5 says operate the pan camera
until the ground gives you a Que or until beginning of the
sleep period, then we'll give you a Que.
SC Okay doke, stand by a minute. Okay, Houston,
SIM Sec AC 2 circuit breakers 3 closed verified, and the pan
camera, both switches in stand by. So would you like us to
go to step 3?
CAPCOM Endeavour, Endeavour this is Houston. Roger,
that appears to be the problem, stand by and I'll see what
we want to do.

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 225:56 CDT 18:30 MC633/2

SC Okay.

CAPCOM Apollo 15, Apollo 15, this is Houston. Roger press on with step 3 from that point when convenient.

SC Okay, go on power ON, 2 seconds, then gray, then stereo. Okay power on and we have a continuous barber pole.

CAPCOM Apollo 15, Apollo 15, Roger. Understand, continue with barber pole.

SC Why don't you just tell us what next, do you want to go to stereo or not?

CAPCOM Apollo 15, Apollo 15, stand by.

SC Okay.

CAPCOM Apollo 15, Apollo 15, press on with stereo please.

SC Roger, it's stereo now, still barber pole, and I guess we'll go to step 4 now. Okay.

CAPCOM Apollo 15, Apollo 15, Roger.

SC Okay, operate, still barber pole.

END OF TAPE

CAPCOM Apollo 15, Apollo 15, Houston, Roger we understand dual barber pole, and we'll give you a cue when to turn it off, okay, thank you.

SC Roger we're standing by.

CAPCOM Apollo 15, Apollo 15, Houston, over.

SC Go ahead.

CAPCOM Apollo 15, Apollo 15, we've succeeded in using up the last of the film in the pan camera. You may now go pan camera mode stand by, and after 1 minute, pan camera power off per step 6, over.

SC Okay, understand, pan camera to stand by and 1 minute off.

CAPCOM Apollo 15, Apollo 15, roger. Apollo 15, Apollo 15, Houston we're going to take down network line here for 20 seconds we'll be back up with you after that.

SC Alrighty.

SPEAKER Madrid comm take test 1.

SPEAKER Roger, read you loud and clear Madrid, stand by for some keys.

MADRID key is 100 percent.

SPEAKER Roger Madrid, thank you.

MADRID Madrid comm take test 1.

SPEAKER Houston comm take testing 1, 2, 3, test out. Madrid you can contact.

MADRID Roger, I copied your first 2 keys. I don't know when exactly you decided to stop there.

SPEAKER On a 3 count Madrid.

PAO This is Apollo control. Now Apollo 15 is now 82 hundred miles from the moon. And the crew should be in the midst of an eat period, and we plan to put them to bed at 228 hours or about 1 hour from now. Prior to that, they'll put the spacecraft in a stable attitude and then start it rotating slowly so that it gets equal exposure to sunlight and darkness. This is to maintain the proper temperature equilibrium. Dave Scott inquired a while ago if we were planning to do midcourse correction 5, that's the midcourse opportunity at 238 hours 46 minutes, and the flight dynamics officer reported at that time that yes, we did plan to do midcourse correction 5 based on the preliminary data that we have. The preliminary tracking information. That burn will be about 2 feet per second which would be performed with the reaction control system thrusters.

CAPCOM Apollo 15, Houston, over. Apollo 15, Apollo 15, Houston, over.

SC Houston, 15, go ahead.

CAPCOM Roger 15, we see you maneuvering to PTC, we're requesting that you not maneuver to PTC until

APOLLO 15 MISSION COMMENTARY 8/4/71 CST1856 GET226:22 634/2

CAPCOM the SIM Bay covers are closed. I don't know whether they're closed at the moment or not.

SC Roger, they're closed up.

CAPCOM Understand and -

SC We're just following down through the flight plan.

CAPCOM Good weren't sure where you were, that you fellows are through eating. We have two or three calls to send up to you when convenient.

END OF TAPE

CAPCOM Apollo 15, Apollo 15, Houston. You can go to T stop with the mapping camera now. And that would be to follow the checklist for pages 1-39 section 6, 7 and 8, first one being mapping camera on to off 30 seconds and that's stand by. Over.

SC Houston, 15.

CAPCOM Apollo 15, Apollo 15, Houston go.

SC Houston, 15. Okay, listen Bob, is this the T stop on the mapping camera photo pad at 22410.

CAPCOM Apollo 15 Apollo 15. That's a roger.

SC Okay, Houston. Go with the rest of the update for the flight plan.

CAPCOM Apollo 15 Apollo 15, Houston. Roger, we want to remind you, when you go into PCTC to follow the lock in the flight plan for the useage of quads rather than the section in the checklist where it calls out to disable all jets on two adjacent quads. This is to avoid contamination of the mass spec, just a reminder to follow that little box in the flight plan. Over.

SC You mean that little box on page 343.

CAPCOM Apollo 15 Apollo 15, that a roger.

SC Okay, we'll follow that little box just like it's in the flight plan. Go ahead with the rest of the updates.

CAPCOM Apollo 15 Apollo 15, roger. One discussion here on the UV photos which we're delaying until after the EVA. It looks like the last chance to get these photos to that 246-15 which is about 3 or 4 hours after the nominal end of the EVA. We'd like to propose that for your consideration. Over.

SC That's just fine, we'll do it, 246-15. Thank you. Okay, Bob do you have anything else to add to the flight plan.

CAPCOM Apollo 15, Apollo 15, Houston. Roger one more item we just got is a request that now that the covers on the X-ray are closed. We're requesting X-ray on for 10 minutes and then off. Over.

SC Okay, X-ray on for 10 minutes and then off.

CAPCOM Apollo 15, Apollo 15. The last position should be stand by rather than off. Over.

SC Roger, stand by.

SC Okay, Houston. The X-rays on and we'll turn it off in 10 minutes. Anything else?

CAPCOM Apollo 15 Apollo 15, Houston. That's a stand by in 10 minutes. I beleive you understand that, Dave anyway.

SC Rog.

CAPCOM And I believe that the next thing we will want from you is a call when you're ready to go to sleep, and we will verify all systems at that time so we can get a solid goodnight rather than tagging on, again like last night.

SC Roger, that.

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 22738 CDT 2012 635/2

CAPCOM Apollo 15 Apollo 15, Houston. We see you cycling through the dap. We suggest you need a zero in R2 to get BD roll. Over.

PAO This is Apollo control at 227 55 minutes. The crew is - aboard Apollo 15, is presently getting the spacecraft set up for the passive thermal control where they will be rotating at about 3 revolutions per hour. This is the standard set up used during the sleep periods to maintain proper thermal equilibrium on the spacecraft. And at the present time, Apollo 15 is 10 488 nautical miles from the moon. The spacecraft velocity 4 129 feet per second. We're going to replay the video tape from this mornings check of the TV system on the lunar roving vehicle at the Hadley Base site. The total tape duration is about 12 minutes.

SC Houston, 15.

CAPCOM Apollo 15, Apollo 15. Go.

SC Hey Bob. Do you need an update on the rate to load in the P20 for PTC. Wasn't that meant to be updated to .375 or should we leave it at .35.

CAPCOM Apollo 15, Apollo 15. Let's keep it at .375.

SC Understand you want the flight plan updated to .375.

CAPCOM Apollo 15, Apollo 15. That's a roger.

SC Roger. Thank you. We got the update.

SC Houston, Apollo 15.

CAPCOM Apollo 15 Apollo 15, Houston. Go ahead.

SC Yes, Bob. We're trying to retract the mapping camera. But the time has been well exceeded and we still have the barber pole indication.

CAPCOM Apollo 15 Apollo 15, stand by.

END OF TAPE

CAPCOM Apollo 15, Apollo 15, we'd just as soon you didn't spinup quite yet, we still think the rates are a little high. Over.

SC Okay, Houston, we'll wait on your cue then.

CAPCOM Apollo 15, Apollo 15, Houston, concerning the mapping camera retraction problem, question is did you get a barber pole during the Alpha/X-ray cover procedure? Over.

SC You'll have to amplify your question there a little bit, Bob, you mean when we were operating the covers?

CAPCOM Apollo 15, Apollo 15, Houston, Jim the question basically is did the barber pole, did the talkback function properly when you just closed the alpha/X-ray covers? Over.

SC Yes, Dave said it worked fine.

CAPCOM Apollo 15, Apollo 15, Houston, Jim, stand by on that because your last answer and they're working on it.

SC Okay, I think I'll take the - go out of the retract position on the switch and just wait 'til your word.

CAPCOM Apollo 15, Apollo 15, that sounds good to me, Jim.

CAPCOM Apollo 15, Apollo 15, Houston, you'd like to hold off on PTC a little bit longer 'til we get this mapping camera business straightened out. And, Jim, for some troubleshooting on this, we'd like to have you check on panel 181 the main A circuit breaker closed, and the deploy retract switch in the retract position, and on panel 278 the deploy main A circuit breaker closed. Over.

SC Those two circuit breakers and the switches are verified, Bob, closed.

CAPCOM Apollo 15, Apollo 15, copy.

SC And the pre-sleep checklist: there's been no medication today, onboard readouts are bat C 37, pyro bat A 37.3, pyro bat B 37.3, RCS 56, 55, 54, 55. And I guess after we get PTC squared away, we'll give you the memory dump.

CAPCOM Apollo 15, Apollo 15, Houston, copy the crew status and the onboard readout and stand by on E mod; we may ask you for that before PTC but we'll be back with you on that in a minute.

SC Houston, 15.

CAPCOM Apollo 15, Apollo 15, Houston, go.

SC Rog, unless you got a solution for the camera now, why don't we troubleshoot it in the morning and get on with our evening powerdown. Okay?

CAPCOM Apollo 15, Apollo 15, Houston, that's a roger, we've just come to that conclusion, ourselves, down here. We're ready for an E mod dump before the start of --

CAPCOM -- PTC, please.

SC Okay, fire away.

CAPCOM Apollo 15, Apollo 15, Houston, one last attempt on the mapping camera; we suggest you try mapping camera doors open, then retract, and then doors close if successful on the retract. And you can do that after you start up PTC, if you like.

SC Roger, we've already attempted to do that, Bob.

CAPCOM Apollo 15, Apollo 15, Houston, roger, you're ahead of Building 45. And Apollo 15, Apollo 15, we have a good E mod dump.

SC Houston, 15, how do the rates look now?

CAPCOM Apollo 15, Apollo 15, Houston, your rates look good, you're GO for PTC.

SC Okay, we'll try.

CAPCOM Apollo 15, Apollo 15, Houston, as soon as you configure the mass spect, multiplier-low, discriminator-low, experiment-on, ion source-on et cetera, you're GO for sleep and no more comments from the ground until morning.

SC Roger.

CAPCOM Apollo 15, Apollo 15, Houston is out for the evening.

SC Don't go too far out, though.

CAPCOM Apollo 15, Apollo 15, our ever watchful eye will be on you while you sleep.

SC Very good.

PAO This is Apollo Control; spacecraft now is beginning the passive thermal control rotation, as we rotate from one antenna to another OMNI antennas, we'll pick up some noise from time to time during the evening.

CAPCOM Apollo 15, Houston, you called just as we locked and locked onto the height onto the OMNI.

SC Okay, Bob, just wanted to know how initial rates of PTC looked?

CAPCOM Apollo 15, Apollo 15, initial rates look good, we'll be keeping an eye on it for you though, Al.

SC Okay, Bob, it just didn't look like I got quite as much read when I entered on that as I expected.

PAO Our Communications Engineer reports that the crew have configured the communications circuits on board the spacecraft now for their sleep period and we do not expect to hear from them further during this 8 hour rest period. We've had some questions on the double calls, the repetition of the call Apollo 15, by the CAPCOM. And the Network Controller reports that this is being done because of a weak or low level we've got on the landlines from Houston to Madrid. And normally the tone that is sent out in conjunction with the CAPCOM's call, the bleep --

PAO -- that usually precedes the call is used to key the ground transmitter so that it's in the proper configuration for uplinking the voice communications. The problem we're having with the lines gives us a low level at Madrid and the beep is not getting through. At least not with sufficient strength for the transmitter to key the transmitter. So, in order to key it, the CAPCOM repeats the call Apollo 15. The first Apollo 15 keys the transmitter and the second one goes up to the spacecraft. This is a relatively minor problem; the network controller knows it can be readily remedied once we've completed our pre-sleep checklist and have gotten the crew off to - off to sleep and don't expect any further air to ground communications they'll simply take the line down, make the necessary corrections to it, and within a matter of minutes have the situation remedied. It was decided to use the so-called manual keying technique with the CAPCOM repeating the Apollo 15 call, simply because it was a simple procedure and because we were close to the sleep period when we could do the maintenance on the lines that were necessary. Apollo 15 at the present time is 11,534 nautical miles from the moon and the spacecraft velocity is 4078 feet per second. The crew reported prior to beginning their rest period that the mapping camera which extends out from the SIM bay on a rail system had not, apparently not retracted. They have an indicator in the spacecraft cockpit that tells when this camera has retracted and the indicator showed that it had not come back in. After checking the situation with the Orbital Science Officer, it was decided that it would do no serious harm to leave the camera deployed. The only concern would be that the temperature could possibly go higher than desired. However, the temperatures that we've seen from the passive thermal control mode previously indicate that this should not be a problem; we would not expect the camera to become too warm and more importantly the film cassette; and the thermal experts feel that the temperatures that it would encounter in the SIM bay during the passive thermal control mode would not cause us any problem. So we've elected to follow the suggestion of Dave Scott and leave the camera deployed until tomorrow and work on the problem then. One suggestion that the Orbital Science Officer had is that perhaps the camera retraction mechanism had become too cold and is for that reason failing to retract and perhaps in the passive thermal control mode when the temperature will warm up somewhat, it'll free whatever it is causing the problem, and we'll be able to retract it in the morning. At 228 hours, 24 minutes, this is Apollo Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/4/71 GET 228:24 CDT 20:58 637/1

CAPCOM Apollo 15, Houston. Over.

CAPCOM Apollo 15, Houston. Over.

SC Houston, 15. Go.

CAPCOM Roger, 15. Would you believe that we have one more call on the pan camera. We do not show pan camera power to off please and unfortunately that means that we might heat up the film too much. So we would like pan camera power to off. And guys as long as you're down there would you mind trying mapping camera retract once more. 15, we see a certain rise in temperature there which may mean that it was frozen, it'll improve. And we have not seen any mass spec configuration yet. And a progress report on your PTC says it's about 60 40, but it will last the night.

SC Houston, it doesn't look like the mapping camera is going to come back in. What's the problem that was left out?

CAPCOM 15, Houston. Would you believe we've just determined - there doesn't seem to be a problem if it stays out overnight.

SC Great. Then I guess we can call it quits for the night. Okay?

CAPCOM I sure hope so.

SC Okay, good night.

CAPCOM 15, we don't have TM on you right now. Is the mass spec taken care of?

SC Rog. The mass spec's taken care of - there was one switch out of position. And the mapping camera is going to go to off.

CAPCOM Roger, copy Dave. We'll try again.

SC Okay.

END OF TAPE

CAPCOM Apollo 15, Houston. In the blind, no need to reply; our pan camera data still shows power on, this is the middle switch on the bottom row of the power boost switch, it should be in the center OFF position. No need to reply. Over.

PAO This is Apollo Control at 229 hours 30 minutes. The Flight Surgeon reports that the crew appears to be getting to sleep at this time. We have biomedical data on Command Module Pilot Al Worden and his rates indicate that at least he is approaching sleep. Apollo 15 at the present time is 14,244 nautical miles from the moon and the velocity is down now to 3,976 feet per second. During this rest period we plan to come up with hourly status reports and in the . . . in between status reports we will have lines down with tape recorders running to record any unexpected conversation with the crew. The spacecraft is in a stable passive thermal controlled attitude right now, that will be one of the activities here in Mission Control tonight, to watch that attitude and see that it does not diverge from acceptable limits and assuming that the attitude stays stable, the spacecraft rotating at approximately 3 revolutions per hour and not diverging from the preset attitude, we would not plan to call the crew this evening. At 229 hours 32 minutes, this is Apollo Control.

END OF TAPE

PAO This is Apollo Control, the astronauts appear to be sleeping soundly at this time, this based on the biomedical data we have on our command module pilot, Al Worden, and we have about 5 and a quarter hours remaining in this sleep period. The spacecraft is in the passive thermal control mode, rotating at the rate of about 3 revolutions per hour to maintain the proper thermal equilibrium, and has at the present time, 2 24 foot booms extended from the service module, one boom holding the massspectrometer experiment, the other the gamma ray spectrometer. Just before we said goodnight to the crew at the scheduled time in the flight plan of 228 hours 50 minutes, they reported that the indicator in the spacecraft showed that the mapping camera had not retracted on command after checking this primarily with the thermal engineers to determine that there would be no problem as far as the film that's held in the cameras magazine. We elected to leave the camera deployed, it's on some rails that extend out from the sim bay and work with it tomorrow. It presents no serious problem. The concern initially was that perhaps, without retracting the camera and closing the doors over the camera, that the film in the casset which is now exposed, would get too warm, however a check with the thermal people in the back room indicated that the film should experience no thermal problems. The temperature should remain well within acceptable limits, even with the camera and the magazine extended. And the camera was left in the position that it is in, and one of the things that will be attempted tomorrow is to determine if perhaps the doors, which close over the camera once it is retracted are possibly jamed against it. Also one thought was that perhaps before we began the passive thermal control rotation of the spacecraft, that the area of the sim bay where the camera was located may have become quite cold, causing the problem to occur, and perhaps causing something to freeze up and stop the camera from retracting. So the present configuration of the spacecraft is with the 2 booms deployed 24 feet, the mapping camera deployed, and rotating about its longitudinal axis at the rate of 3 revolutions per hour. At the present time Apollo 15 is 16,668 nautical miles from the moon, and the spacecraft velocity is 3,910 feet per second. At 230 hours 34 minutes this is Apollo Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET 232:27 CST 1:01 MC 640/1

PAO This is Apollo Control at 232 hours 27 minutes ground elapsed time. 3 hours 17 minutes remaining until crew awake time. The crew of Apollo 15, asleep at this time. No word from them in a couple of hours or more. Present distance from the Moon 21,006 nautical miles; velocity now 3,827 feet per second. Maroon team of Flight Controllers settled in for the night shift. And, at 232 hours 28 minutes ground elapse time, this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 CDT 2:00 GET 233:26 641/1

PAO This is Apollo Control at 233 hours 26 minutes ground elapsed time. Apollo 15 crew still apparently asleep as they coast homeward from the moon. Now at 23 194 nautical miles out from the moon, approaching earth at a velocity of 3795 feet per second. Slightly over two hours, 2 hours and 18 minutes remaining in the scheduled sleep period. Flight controllers on the grave yard shift here in Mission Control watching a play back of the television from the 3 EVAs.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET 234:44 CST 3:20 MC 642/1

PAO This is Apollo Control 234 hours 44 minutes ground elapsed time. 1 hour remaining in the Apollo 15 crew rest period. And, here in Mission Control, got a clock counting down to splash; showing now 60 hours 26 minutes; which is tentatively the time from now until splashdown in the North Pacific just North of Hawaii. On the seventh of August. Apollo 15 now 26 130 nautical miles out from the Moon, in route to Earth; velocity 3 761 feet per second. We'll bring that to Air/Ground Circuit live, hopefully prior to the first call to the crew in approximately an hour from now. At 234 hours 46 minutes, ground elapse time, this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/5/71, 4:20 CDT. 235:45 GET, 643/1

PAO This is Apollo Control at 235 hours
45 minutes ground elapsed time. And the clock has run out
on the sleep period, rest period, scheduled for the crew.
The spacecraft communicator Joe Allen preparing to call the
crew for the wake-up call.

CAPCOM Good morning, Endeavour. This is
Apollo Control in Houston, Texas, tuning the band. Over

SC Good morning, tuning the band, this
is Endeavour. Go.

CAPCOM Roger. Good morning, Endeavour.
This is Houston with CSM consumables and a few good words
about your flight plan when you're ready.

SC Stand by one.

CAPCOM Okay, Dave. And you troops sure start
the day early up there, I must say.

SC Yes. It seems that way, doesn't it?

SC Okay, Houston. We've located the
flight plan. Go ahead with your updates.

CAPCOM Endeavour, this is Houston. Were you
calling?

SC Roger, Joe. We've located the flight
plan. Go ahead with your updates.

CAPCOM Okay, Dave. I guess, let me start
with the CSM consumables. At 235 plus 30, RCS total, 41;
quad A, 43; 40, 38, 41. H2 tank 1, 41, 40, 36; O2 tank 1,
56, 58, 45. And the only immediate other thing I have for
you, Dave, is a comment on the maneuver at 236 hours, about
the gamma ray boom retract. We'd like for you to - -

CAPCOM 15, this is Houston. How do you read?

SC Last I heard was gamma ray. Go ahead.

CAPCOM Okay. The rest of that mysterious
transmission is essentially the following, Dave. We got
a funny in that gamma ray experiment and so we're going to
want to modify the use of it a little bit today. It should
be no major inposition but the flight plan calls out for
the gamma ray boom to be retracted at 236 hours. We'd
like to modify that by saying, turn the gain step shield
off at that time and we'll want you to retract it about
10 minutes later; we'll give you a cue for that. Over.

SC Okay. Gain step shield off at 236
and stand by for your cue for retraction.

CAPCOM That's correct, Dave. I've got a few
other good things here but there's no hurry on any of them.
Be willing to stand by if you wanted to get squared away and
give me a call later or whatever you'd like to do. It's
your preference.

SC Well, let's go ahead. We're getting
squared away.

CAPCOM Okay. If you have the flight plan

APOLLO 15 MISSION COMMENTARY 8/5/71, 4:20 CDT, 235:45 GET, 643/2

CAPCOM then, let me add the following. At
236 plus 45 add the step X-ray to ON. And then turning over
several pages - -

SC Roger. 236:45 X-ray ON.

CAPCOM Okay. And turning over several pages
to 241 plus 25.

SC Go.

CAPCOM Roger. After the step 02 heaters
1, 2, and 3 to AUTO, add 02 tanks 1 and 2, 50 watt heaters
main B to - to OPEN. And - -

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 430 CDT 235:55 GET 644/1

CAPCOM And 02 tank 3 50 watt heater main A 1 to open. Over.

SC Okay. 241 25 02 heater or 02 tank 1 250 watt heaters main B to open and 02 tank heater, 50 watt also? Main A-1 open?

CAPCOM Stand by, Dave. I'm sorry about this one. Stand by.

SC Okay.

CAPCOM Okay, Endeavour. Let me try that again. Had a typographical error down here. It should read 02 tank-1 50 watt heater main B 1 open. And 02 tanks 2 and 3 50 watt heaters main A-2 open. Over.

SC Okay. 02 tank-1 50 watt heater Main B-1 open and tanks 2 and 3 50 watt heaters main A-2 open.

CAPCOM That's correct, Dave. I apologize for this slow start there. Now I've got some DAP load changes that cover the times from about 247 hours to 252 hours and the change is apparently because of a mistake in the flight plan you have on board that we in the mean time have caught down here and so there are several deletions and additions during that time. The first one starts at 247 plus 28,

SC Go ahead. I've got it.

CAPCOM Okay. Delete your VERB-48 11 111 and X 1111 and add, stand by a second.

SC That's twice.

CAPCOM I'll be very careful from here on. Stand by. Okay, DR I'm ready to try it again. You've deleted at 247 28 the line with all the funny number ones and you're suppose to delete in the DAP load column also that same entry, it's in the time column, I guess. And then turn the page.

SC Yes, roger.

CAPCOM Okay. Go to 248 hours on the next page and in the notes column change the DAP load status to read 11101 and the rest is the same. And this DAP load status continues through the PTC until 251 hours. And the next change is at 251 hours and 4 minutes.

SC Okay. 251 04 and I got the other 3 changes. Go ahead.

CAPCOM Okay. Delete the VERB 48 line and the DAP load over in the time column there.

SC Okay.

CAPCOM And the next change is at 251 47. Delete the VERB 48 line and the DAP load in its corresponding time column.

SC Okay. And I guess over in the notes column we're still carrying 11101. Right?

CAPCOM That's affirm, Dave. And starting at 252 hours your DAP load status should read 111 - -

APOLLO 15 MISSION COMMENTARY 8/5/71 430 CDT 235:55 GET 644/2

CAPCOM Okay. Let me try again. Starting - -

APOLLO 15 MISSION COMMENTARY 8/5/71 GET 236:02 CDT 4:37 645/1

CAPCOM ... try again. Starting. Okay starting at 252 plus 00 hours, in the notes column DAP load status should read 111 01 times 11 11 and this should be carried through the rest period until 261 hours. Over.

SC Okay, Joe, you were saying something there about 252:30 as we lost comm. I got the entry of 252:00. Is there any change in 252:30?

CAPCOM Negative, Dave. The change at 252:00 should just be continued through until 261 hours and that's just the DAP load status, should be changed correspondingly through until that time.

SC Okay. I see and then we're just 111 01 all the way.

CAPCOM That's correct.

SC Okay. Go ahead with your next.

CAPCOM Dave, that's all I've got for the time being. And I think I'd be afraid to go ahead much further if you're really counting those times. Maybe I should start keeping score on you as well.

SC (Laughter) Okay.

CAPCOM We're happy for the time being. We're standing by for a crew status report at your convenience and we'll be watching for the gain step shield to come off.

SC Okay. I'll get right back with you in about 5 or 10.

CAPCOM Thank you.

CAPCOM Endeavour, this is Houston. We'd like for you to retract the gamma ray boom for us please and we'll be watching for your torquing angles. Also, if you'd like some news reporting in the background, I have the morning news here, if you're interested in that at all. Over.

SC Rog. Gamma ray going to retract now and stand by the news.

CAPCOM Okay. Roger. You can use that for background for the P52, I guess. President Nixon in effect declared U.S. responsibility for offensive ground combat operations in Viet Nam at an end. With the draft still in Limbo, selective service went ahead today with the lottery to determine the order in which next year's nineteen year olds will face military service. Secretary of State William P. Rogers plans to go to the United Nations to push for a more energetic international relief effort for East Pakistan today. The Senate Armed Services committee completed action on a 21 billion dollar military buying bill that meets most Nixon administration weapons requests. President Nixon and his family will fly to Manchester, New Hampshire, and then to a private island in Maine this weekend. When visits to New Hampshire also are planned by four Democratic presidential hopefuls and Republican challenger Paul N.

APOLLO 15 MISSION COMMENTARY 8/5/71 GET 236:02 CDT 4:37 645/2

CAPCOM McClusky, Jr. Predicted weather for recovery day is 2000 feet scattered, 10 vis, and waves approaching 6 feet. Wind is north by northeast, 18 knots. I have a long list of baseball scores here, which I'll just glance over. In the American League, New York beat Cleveland 7 to 3. I have here a local request for the Dodgers who lost to the Astros 2 to 0. The American Classic Golf Tournament starts today at the Firestone Country Club in Akron, Ohio. And the winner will get -

END OF TAPE

CAPCOM I have a long list of base ball scores here which I think I'll just glance over. In the American League, New York beat Cleveland 7 to 3. I've had a local resquest for the Dodgers, who lost to the Astros, 2 to 0. The American Classic Golf Tournament starts today at the Firestone Country Club in Ackron, Ohio, and the winner will get \$30 000 dollars. Sounds to me like the pay is pretty good and I expect the hours are short. The U. S. Pan American Team went on a fantastic Gold Medal spree yesterday, winning 17, rather 16 of the 17 medals at stake. The only one the Americans escaped getting was the Gold Medal in weight lifting. And the total in the games which are being held in Columbia is 78 for the United States, 36 of them gold and 51 for Cuba, 12 of them are gold. And I'll end with the story comparable all the way to that incredible contest between the Apollo 15 All Stars and the North American Rockets. Last night in the Texas League 21 year old right hander Tom Walker, pitching for Dallas-Fort Worth team pitched a 15 inning, no run, no hit game against Albuquerque. He retired the last 21 men in a row. Only 4 Albuquerque players got on base and all of them were on walks. Walker got the first 18 batters out before he walked the first one. He threw 153 pitches in the game and the no hitter is an all time record in the Texas League and may very well be an all time record in Major League Base ball. Walker's manager told him that if he did not win the game in the 15th inning, he was going to have to pull him out. Walker said his arm felt a little tired, but he felt okay, understandably. Like doing 3 EVAs I expect. And that's all the news for this morning.

SC Boy. It sounds like he's as good as our very own Blinky.

CAPCOM That may well be, Dave. That never occurred to me.

CAPCOM At least the equal there of.

SC Roger. At least almost.

CAPCOM Endeavour. We've copied the torquing angles. Thank you. And, Dave, if you can get a volunteer to work on the mapping camera for us, we'd like to try to pull that mapping camera in and get the covers closed in preparation for the EVA. We're not quite sure that the position the camera's in right now and the procedure I will read by step by step, but it's basically to open the covers, try to extend the camera, we'll confirm the extention and then we'll have you retract the camera and ultimately retract the covers. And, I'll be standing by for your advise on this. Over.

SC Okay, Joe. We'll see if we have time to work on this. But, it's my understanding we do not have to have it retracted for the EVA.

CAPCOM Dave, that's my understanding too. I think the main reason for wanting to do this if time is available and it's, - - and it's only - it be at a nice thing.

APOLLO 15 MISSION COMMENTARY 8/5/71 CDT 4:54 GET 236:20 646/2

CAPCOM Dave, just to complete that last statement you're correct. We don't have to have that device retracted for the EVA. But apparently it gives the film people a nice feeling regarding their film not getting too cold or too hot. That's the reason for that.

SC Okay. Well, let us see if we can get to it.

CAPCOM Roger. Just give a whistle.

SC Okay. We sort of flip-floppd that P23 and E period so that we could take advantage of our set up for eating and all. And we'll get on with P23 as soon as we finish breakfast.

CAPCOM Sounds good.

END OF TAPE

CAPCOM Apollo 15 this is Houston. All other things being equal troops we'd prefer that you do the P-23 before you begin the eat period because it gives us an hour of pointed X-ray data during your eat period.

SC Okay, Joe, but I guess the ene quality is the stowage situation in here and assuring that we can get properly prepared for the EVA so we'll start the P-23 in probably about 5 minutes or so because we're almost through eating. But we sort of have to take advantage of our configuration in here in order to stay with the time line later on.

CAPCOM That's fine, Dave. We understand, thank you.

CAPCOM Endeavour this is Houston.

SC Go ahead.

CAPCOM Roger. I've got some information about your midcourse 5, which is scheduled to come up here. We have a firm decision that there will not be a midcourse 5 maneuver required and the numbers behind that are GAMMA of minus 6.69 your vacuum paragee is 18.4 and the midcourse 5 correction that we're showing now would be 3/10 of a foot per second. The corresponding midcourse 7 correction runs at about 1.8 feet per second and based on that new information, we wondering if you're still interested in doing the UV photography at scheduled time we're waiting until after the EVA and we're also wondering what your choice will be on the solar corona photography. Over.

SC Okay. That's pretty fantastic guidance sin't it. Let us take another look at the flight plan here and come right back at you.

CAPCOM Okay, Dave, fine. And no hurry on the, on that decision. We would like the gamma ray step shield on, now please.

SC Okay. Gamma ray guage step on.

CAPCOM Thank you.

SC And Joe, I guess on the Corrona photography bag R has been expended. As far as the UV is not as much a problem of time as it's a problem of stowage. It's stowed way down deep in one of the Endeavour's lockers here and to get at it requires quite a bit of minipulation of bags. And that's the reason we wanted to delay that if t was possible.

CAPCOM Okay, Dave. We understand that. And that sounds like it's a far more reasonable to delay that. The timing is not critical. As far as we're concerned we just wanted to give you a balanced workday.

SC Okay, fine. We don't mind loading up a little after the EVA because it really saves us a lot of work in the long run and you might wonder why we didn't put the UV stuff somewhere else, but there's just nowhere else

APOLLO 15 MISSION COMMENTARY 8/5/71 502 CDT 236:28 GET 647/2

SC to put it and it's in its own proper little spot.

CAPCOM No, we understand, thank you.

SC Houston, 15.

CAPCOM Go ahead, 15.

SC Okay. Crew status report for you and you can have the docs take a look at the LMP bios, see if that's acceptable.

CAPCOM Okay.

SC Ready to copy?

CAPCOM Go ahead.

SC Okay. 7 hours sleep a piece and PRD's 25028 23193 08031.

CAPCOM Okay, Dave, thank you. And we see that we've got the X-ray going. We'd like for you to change the setting on the gain step. Give us a one click increase, which will move us from the position 7 back to position 1. Over.

SC Okay. You've got a one click increase.

CAPCOM Okay. We see it Dave and Jim's BIO looks clean to us down here. Thank you.

SC Okay.

END OF TAPE

PAO This is Apollo Control. The crew reported in the last exchange that the - each of the three crewmen had a good 7 hours sleep during the night. And also the ground advised the crew that the magnitude of midcourse number 5 - midcourse correction burn number 5 - as shown by present tracking is so small that it will be deleted. It's now showing around 3/10 of a foot per second. Meanwhile, the space flight meteorology group of the National Weather Service said this morning that the end of mission weather conditions are expected to be satisfactory in the area north of Hawaii where Apollo 15 will splash down Saturday. The forecast is for scattered clouds with good visibility, east-northeast winds 15 to 20 knots, and seas to 6 feet. Temperatures will be in the upper 70's. Splashdown clock still counting, now showing 58 hours 7 minutes to Apollo 15 splashdown. At 237 hours 4 minutes ground elapsed time, standing by on air/ground, until the crew is put to bed again tonight, this is Apollo Control.

CAPCOM Endeavour, give us six clicks on the gamma ray gain switch, please.

SC Okay. Six clicks.

CAPCOM Endeavour, this is Houston.

SC Houston, Endeavour. Go.

CAPCOM Roger, Dave. A couple of miscellaneous items I'd like to ask you about. First of all, the trench sends their congratulations to whoever's doing the P23 for us. The errors are less than one sigma and they're awarding the honorary Vasco de Gama Navigation Award for excellence in this. Secondly, we're puzzling over your remark about magazine Romeo, which you reported to us was exhausted. And we're wondering if you just read the frame number from the mag and if so what it read. Over.

SC Yes. Joe, this is Al. The last reading of Romeo I think was 110.

CAPCOM Okay. Al, thank you. And were you doing the P23 for us?

SC Si.

CAPCOM Okay. I'll tell you a little something about Vasco de Gama later on. Another easy item here; you're going to come up on a bat charge. I guess bat B charge starting at 239 hours and we'd like to delay that to 244 hours, please.

SC Okay. Delay the bat B charge to 244. And be advised - you've got to know that we've got best navigator in transearth lunar space up here.

CAPCOM At least one of them, I'm sure.

SC Not the only one.

CAPCOM Roger. We copy. And finally, I'd like to get a volunteer to take a whack at this - configuring

APOLLO 15 MISSION COMMENTARY, 8/5/71, 5:33 CDT, 236:59 GET, 648/2

CAPCOM the map camera properly. And it's
going to be a few short steps and if it works great, we'll
have a lot of good engineering data regarding the thermal
properties of that beauty. And if it doesn't work, we're
just going to turn it off and leave it. And when somebody's
ready to do that, I'll go through the steps. There're not
too many.

SC Okay, Joe.

END OF TAPE

SC Okay, Joe, somebody'll be ready in just a few minutes.

CAPCOM Rog. Thank you, Dave.

SC Okay, Houston, Endeavour. If you want to try your camera techniques again, let's give it a whirl.

CAPCOM Okay, Endeavour. I've got 5 steps here and I think it's easiest for me just to read them to you and have you carry them out rather than copying them down. And the first one - first two steps -

SC Rog.

CAPCOM ... on panel 181, verify logic power MAIN A circuit breaker CLOSE.

SC Okay, verified.

CAPCOM And same panel, verify logic power switches, two of them, to deploy retract.

SC Verified.

CAPCOM Step 3 on panel 278, the experiment covered deploy circuit breaker MAIN A to CLOSED.

SC Verified. Closed.

CAPCOM Step 4 on panel 230, the map camera verify stand by.

SC Verified, stand by.

CAPCOM Okay, and coming up on step 5 and let me read through this and I'll stand by for questions and if there are some. We want the map camera track to extend and simultaneously we want the experiment cover map camera laser altimeter to OPEN and we want those two things done simultaneously.

SC Okay. Understand. Go to extend and open the covers, map camera laser simultaneously.

CAPCOM Roger. And a note on that, I guess, on the map camera track to extend we'll be watching that for about between 4 and 5 minutes or until you get a gray talkback on there. And we think this is going to clear up our problem and if it doesn't, we're just going to turn the whole ball of wax off and go ahead and do the EVA as normally planned. Over.

SC Okay, Joe. I'm going to take 3 seconds by my watch.

CAPCOM Rog, Dave. We're watching.

SC Well, I got a gray on the mapping camera. How 'bout that.

CAPCOM Okay, stand by.

CAPCOM Dave, do you have a gray on the door as well?

SC That's affirm, but I did not get a barber pole on the door. It just stayed gray.

CAPCOM Okay, that's good. That just means that it was open already.

SC Right.

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CAPCOM Okay. And that's worked out fine. Apparently, we were having a temperature problem with that thing before and we're back in business just like normal. We'd like now the mapping camera track to retract and that'll take I guess about 4-1/2 minutes.

SC Okay. Map camera track going to retract now.

CAPCOM Endeavour, this is Houston. Be advised that because we're not going to do a midcourse 5, we'll continue the X-ray pointing to about 238 plus 30 and we'll be coming at you with a list of the steps at 238 hours that you can delete because we're not doing the midcourse.

SC Okay, fine.

CAPCOM And Dave, could you have someone check the barber pole on our map camera track to see if you have the gray retract indication, please.

SC Rog. I've been watching it. You've got about 7 minutes and 20 seconds and it's still barber pole.

CAPCOM Okay, that's what we're showing down here. And stand by.

END OF TAPE

CAPCOM Okay, Endeavour, we're satisfied with that mapping camera exercise; 2 more requests on that. Go to OFF with the extend/retract switch, and to OFF with the mapping camera Laser Altimiter Cover Switch please; and we're finished with that.

SC Okay; extend/retract to OFF; and a map camera laser Altimiters going of OFF.

CAPCOM That's right, Dave; and a note for Al. We think that the magazine Romeo based on the Frames Map you gave us still has enough frames left to take the Solar Corona pictures. We'll have some special words for Al on how he is to take those pictures. I guess we'll delete a few of the Solar Corona requirements. Also, word about the PRD Configuration for the EVA. Apparently we will want the CMP to have the PRD whose number reads 25028; and I guess that's the one you've been carrying, Dave. And, Jim, we'll use the one that reads 08031 but we would like to have him reconfirm this number before he starts the EVA. Over.

SC Okay. Let me get that checklist here Joe; standby. The CMP is 250-say again-.

CAPCOM Roger. We want Al to wear the PRD that's now reading 25028. That will distinguish it from the other two with no ambiguity; and Jim to take the one that begins 080, and we want him to give us the full reading off of that before he start the EVA though.

SC Well, we'll have to give it to you now; because it will be in the Sim where we won't be able to get to it.

CAPCOM That's fine. Any time.

SC Okay,(garbled) The one Jim will wear will be 08037.

CAPCOM Okay, Dave. Thank you, and if you'll give us P00 and ACCEPT we'll let you have a new State Victor.

SC Rog. You've got it.

CAPCOM Endeavour, it's your computer.

SC Roger.

SC And, Houston, Endeavour. Do you want to go through the Change in the Flight Plan at 238 hours, if you haven't?

CAPCOM Standby.

CAPCOM Okay, Dave. This involves delaying the SIM Bay turnoff until 238 hours and 30 minutes; and in the tail at 238 plus 05 delete the P30 external Delta V, and the VERB 49 maneuver. Lines at 238 plus 20, Delete Sextant Star Check at 238 plus 28. Delete all the steps from there starting with Circuit Breaker SCS, etcetra up to 238 plus 55; ending with RHC Power Direct to OFF, etcetra. Over.

SC All right. I got all that. Thank You.

PAO This is Apollo Control. Coming up in a few seconds on Apollo 15's exit of the Lunar Sphere of Influence.

CAPCOM This is Houston.

SC Houston we're go.

CAPCOM Be advised at my MARK. You are leaving the sphere of Lunar influence; and it's down hill from here on in.

APOLLO 15 MISSION COMMENTARY 8/5/71 GET 237:58 CDT 6:33 650/2

CAPCOM Mark.

SC Rog. Thank you, Joe. That's nice to know.

CAPCOM Did you notice anything there, Dave? Dis-
continuity in velocity or anything like that?

SC Well, Joe -

END OF TAPE

CAPCOM (garble)
SC Roger. Thank you, Joe. That's nice to know.

CAPCOM Did you notice anything there, Dave? Discontinuity and velocity or anything like that?
SC Well, Joe. That's one of the mysteries that we'll probably have keep to ourselves.
CAPCOM I was afraid of that.
CAPCOM Endeavour, this is Houston.
SC Go ahead.
CAPCOM Roger, Dave. We're looking down the line here towards the EVA. And the Surgeon's getting good Bio Med data on Al now, except one of the three EKG sensors is apparently marginal and there's some noise creeping in. We're just wondering what your standard procedure is regarding sensoring before the EVA exercise. If he's going to resensor it's not going to be a problem, if he's not planning to, maybe we ought to talk it a little. Over.
SC Okay. We're all three all sensed, ready to go if we have a problem, let's get it squared away right now.
CAPCOM Okay. Do you have, - - Maybe Al could try pressing down on three EKG leads by one at a time that may help us out.
SC Okay, here we go. The upper right.
CAPCOM Okay.
SC Okay. The upper center is being pressed.
CAPCOM Okay.
SC Okay, the lower left.
CAPCOM Okay. Stand by.
SC Okay.
CAPCOM Dave, it looks to us like it's one of the two top sensors and we were wondering how difficult it would be to reseal both of them now.
SC Okay. And, I'll tell you what we'll do. A little further down the line here, we'll take care of both of those. We'll just reseal them and everything.
CAPCOM Okay, fine. Thank you.
SC And thank you for thinking ahead on that one.

PAO This is Apollo Control with the exiting Apollo 15 spacecraft of the arbitrary and imaginary lunar sphere of influence. The displays in Mission Control, having to do with velocity and distance switched over at that time from lunar reference to earth reference. The crossing occurred at 238 hours 14 minutes 51 seconds. At this moment, Apollo 15 is 177 225 nautical miles out from earth approaching at a velocity of 2855 feet per second. Landing clock showing 56 hours 40 minutes until splashdown. Midcourse five burn, because of its small magnitude, about three-tenths of a second would be needed, will not be done, which allows the crew more

APOLLO 15 MISSION COMMENTARY, 8/5/71, CDT 6:50 GET 238:16, 651/2

PAO time to take care of others items with the SIM bay equipment, do a little troubleshooting, and a little more pad time for preparing for today's EVA by Al Worden in which he will go hand over hand back to the service module to retrieve film cassetts from the mapping and panorama cameras. At 238 hours 31 minutes ground elapsed time, this is Apollo Control.

END OF TAPE

CAPCOM Endeavour, Houston.
SC Houston, Endeavour. Go.
CAPCOM Rog. I've got an update to your corona window calibration photography and the UV photographs when you're ready.
SC Okay. Stand by one.
SC Houston, Endeavour. Can't seem to get the mass spring boom all the way in and I guess Al is having trouble with it now again with the barber pole and with the talkback half barber pole. And seems to flutter there close to the gray position and doesn't really come all the way in.
CAPCOM Okay, Dave. We copy. Let us think about that.
SC Okay. And we're going ahead with the dump if that's okay?
CAPCOM Okay.
SC And if you'll like a visual check, of just exactly where that's hanging up by and we can give it to you in a couple of hours. We'll have Al go out and take a look.
CAPCOM That's not a bad idea. Does he know about this plan yet?
SC Well, I don't know. We'll check with him. Yeah, he nods his head like he'd probably be obliged to do it.
CAPCOM Okay. Break it to him gently, though.
SC Okay.
CAPCOM And Dave, while I got you here, I do want to comment that the first change in the flight plan is to delete the step at 238 plus 23 that says enable all jets. We think that there is a certain chance that map camera may be stuck out and we particularly don't want RCS jets A4, A2, B1, and B4 to be enabled because they may give us trouble with that camera.
SC Okay. Understand, Joe. We'll scratch that step and make sure A4 A2 B1 and B4 stay off.
CAPCOM Okay. And I'll -- standing by to read you some more photo pads just at your convenience.
SC Go ahead. I've got the flight plan out.
CAPCOM Okay. If you'll turn to page 3-352 which is the corona when the calibration and UV photos procedures page.
SC I've got it.
CAPCOM Okay. The attitude involved in the corona photographs should read 057 005 025. And the time on that 239 plus 08 and the high gain number pitch minus 48, yaw 238.
SC Okay, Joe. 57 005 025 at 239 08 minus 48 and 238 for the high gain.
CAPCOM That's correct and moving down a couple of lines, the shutter speed should be changed from 1/500th to 1/125th. And change the -- and inhibit jets line to read damp rates for 5 minutes. CMC mode to 3.

APOLLO 15 MISSION COMMENTARY 8/5/71 GET 238:32 CDT 7:06 652/2

SC Okay. Understand. Scratch inhibit jets
and substitute damp rates for 5 minutes and then CMC 3 and
the 1/125th replaces the 1/500th on the camera.

CAPCOM That's correct, Dave, and moving down a little
further, delete the line cycle 1 frame change shutter and delete
the line cycle 1 frame. And finally, change the last line enable
all jets to read CMC mode, auto.

END OF TAPE

SC Okay delete line cycle one frame and cycle one frame and CMC auto replace enable on GARBLE.

CAPCOM That's correct and assuming you are going to take the UV photographs after the EVA. I have a photo pad for that if that assumption is correct.

SC Looks like that assumption is probably correct Joe and we'll take the photo pad later on. Lets get on to corona or we won't make it.

CAPCOM Okay, sounds good. Apollo 15, Houston.

SC Houston, go.

CAPCOM Rog, Jim. We understand you are going to delete the UV photographs but after you complete the corona window calibration you will have to do the first step in the UV photos transfer coast procedures there and that first step is Verb 49 maneuver to earth UV photo attitude and it lists the attitude there. We need this for thermal reasons.

SC Rog, we'll do that.

SC Houston, 15.

CAPCOM Go ahead 15.

SC Hey Joe just a point of clarification on the backing to be used for the corona. I don't know whether you are aware or not but the backing that fits into window four which is the right hand rendezvous window has two different mounting pads for the camera, one is 250 and the other is 80 and the 80 is pointing 12 degrees below the X-axis and I just wanted to check and see if you wanted us - if that's the proper pad or if you wanted us to use the 80 or the 250 pad.

CAPCOM Al use the 80 the one pointing degrees above the X-axis.

SC Okay, Joe. Thank you.

PAO This is Apollo Control 239 hours, 19 minutes ground elapsed time. Handover under way here in the control center as Jerry Griffin's gold team takes over from the outgoing shift headed up by Milt Windler of the maroon team. There will not be a change of shift press conference at the end of this shift. Apollo 15 now 175 871 nautical miles out from earth, approaching at a velocity of 2,885 feet per second. Splashtime 55 hours 51 minutes away. Next major item of the morning will be the command module pilot's EVA to retrieve film packages from the SIM Bay. This will take place at 10:24 central daylight time or 241 hours 50 minutes ground elapsed time, that is the cabin depress - the actual EVA will follow some 20 or 30 minutes after. At 239 hours, 20 minutes, up live on air ground with Apollo 15 this is Apollo Control.

END OF TAPE

CAPCOM 15, this is Houston.
CAPCOM Apollo 15, this is Houston.
CAPCOM 15, this is Houston broadcasting in the blind, with a request that if possible we bring back Dave's LCG. If it already stowed in too inaccessible place in the jettison bag, don't bother, but if you can possibly save it, please bring it back.

SC Okay, sorry Houston we were getting suited there, and didn't realize we were off comm, but we copied your request. Let us think about it for a minute.

CAPCOM Roger.

SC Well Houston, I guess that it's a good reason we're about an hour ahead, so we'll go ahead and dig it out.

CAPCOM That's your choice Dave.

SC Well, we're sort of ahead and expecting little things like that to pop up.

CAPCOM Fine.

SC Say Houston, by the way, the LCG you'll get back is the one I wore in the third EVA only.

CAPCOM Roger Dave. That's fine. That's the one we'd like.

SC Okay, okay.

CAPCOM And 15, whenever Al has a quiet moment, I have several prebriefing questions to send up to him about what to look for on the V over H sensor.

SC Okay, give us about an hour for that, then we'll be able to talk to you.

CAPCOM Very good.

PAO This is Apollo Control at 239 hours 58 minutes. Apollo 15 now 174 778 nautical miles from earth. Velocity 2 909 feet per second. And the crew is in preparations for the EVA to retrieve the film cassettes from the panoramic and mapping cameras.

CAPCOM 15, this is Houston. We'd like to have (garble) on the high gain whenever, whenever one of you has a chance to (garble). No need to answer.

PAO This is Apollo Control at 240 hours 06 minutes. Dave Scott reported a short time ago that the crew was about 1 hour ahead on the time line. We do not anticipate however that the EVA will start 1 hour early. We're staying keyed here to the normal flight plan time for EVA. If that changes we'll let you know that, at the present time, we do not anticipate moving the flight plan ahead. The liquid cooled garment that they have asked them to bring back is the one in which Dave Scott replaced a plug when they failed a suit integrity check about LM jettison time in lunar orbit. The experts on the ground would like to take a look at that garment.

END OF TAPE

PAO This is Apollo Control at 240 hours 14 minutes. The CAPCOM Carl Henize, has been joined now by the backup crew commander and command module pilot, Dick Gordon and Vance Brand and by Donald K. Slayton, the Director of Flight Crew Operations.

PAO This is Apollo Control at 240 hours 37 minutes. The crew is busy with preparations for EVA and Apollo 15 is 173 670 nautical miles from earth. Velocity 2935 feet per second.

SC Okay, Houston. Apollo 15.

CAPCOM 15, this is Houston. Go ahead.

SC We're all suited up and down to the comm check portion of the EVA prep, and we're ready to talk to you about whatever you'd like to talk about.

CAPCOM Roger. Stand by.

CAPCOM I guess the main thing we have to talk about is the inspection of the V over H sensor of the pan camera. Are you read to listen, Al?

SC Okay. He can read you, but he's got to reconfigure his panel in order to talk to you, so we'll do that.

SC Okay, Carl, how do you read me now?

CAPCOM Loud and clear, Al.

CAPCOM Hey, on this V over H sensor, I have a set of five steps, or five questions that we'd like to have - for you to have in your mind.

SC Okay. Go ahead.

CAPCOM Okay. Number 1 is, inspect the general area; this is sort of a general point of view; inspect the general area around the V over H sensor and comment on any evidence of thermal or mechanical degradation, and 2, 3, 4, and 5 are sort of more specifically. Number 2, is there any evidence of V over H sensor lens cracking or debris on the lens? In other words, have a good check of the lens, itself. Number 3, Is any large amount of the black paint around the V over H sensor, opening missing? Number 4, Is the plume shield in place around the V over H sensor opening? And the plume shield is what I generally call the - it's the guard around the lens sticking out about 3 inches there. And number 5, Is anything obviously obstructing the V over H sensor field of view?

SC Okay, Carl. We got all those.

CAPCOM Okey doke.

CAPCOM No other special questions at the moment.

Stand by.

SC Okay.

SC Okay. We'll proceed on here then.

CAPCOM Incidentally, I guess we're - we both understand each other on the status of the mapping camera? So far as you know, it hasn't retracted. Is that correct?

SC That is our understanding at this point. I'll let you know when I get out.

CAPCOM Roger.

APOLLO 15 MISSION COMMENTARY, 8/5/71, CDT 8:46, GET 240:12, 655/2

CAPCOM Oh, Al. One more point that I overlooked down here, and that is the people here would like to have you look at the mass spec boom, Al, if it's at all feasible. If it's not convenient to look down at the base of that boom and look at the coils, forget it; but if you can get a look in there, we would expect to find a coil crossover jamming down in the base there and we'd like to have your visual confirmation of that.

SC Roger, Carl. I had intended to do that.

CAPCOM Very good.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET 241:04 CDT 9:38 656/1

SC Comm off. S-band TR, thermal GR OFF. Rog.
SC Houston, Endeavour. I guess the comm is
acceptable to you down there with Al on VOX. Is that
correct?
CAPCOM Roger. We're reading him loud and clear.
SC Roger.
SC Pressure lock on.
SC Off.
SC 900.
SC Rog. Repress to OFF.
SC Flashlight.
SC Flashlight.
SC Got it.
SC Okay.
SC It's off.
SC Now, 300, go.
SC (garble) valve closed.
SC Close em.
SC Negative.
SC (garble)
SC PCD
CAPCOM 15, we'd like to have OMNI Charlie.
SC Roger. OMNI Charlie.
SC Its counterclockwise. It's ON.
SC It's on.
SC Good.
CAPCOM 15, this is Houston. We'd like to get the
high gain antenna up, if that's possible.
SC Roger. We'll do that.
SC Okay, stand by. I'll get the high gain.
SC Get it? High gain?
CAPCOM Roger, and thank you.
SC (garble)
SC Negative. (garble)
SC They're installed.
SC Attached.
SC And work.
SC (garble)
SC Okay.
SC Wait a minute (garble)
SC I'll go on SCM whenever you're ready.
SC (garble) disconnected.
SC All verified.
SC Rog. Rog.
SC (garble) off.
SC Down to a left hand LEP, Jim. (garble) up with
gloved helmet.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET 241:27 CDT 10:01 657/1

SC Down to the left hand (garble). (garble) gloves
and helmet. Gloves insight. Cabin pressure 5.2.

SC Cabin pressure 55.

PAO Distance now, 172176 nautical miles. Velocity
2969 feet per second.

SC Cabin pressure is approaching 6 and all (garble)
just a bit.

SC Yep.

SC (garble).

SC Keep an eye on it.

SC Roger.

SC (garble).

SC Okay.

SC Do that to your integrity check before I put my
helmet and gloves on.

SC (garble) closed.

SC Cabin pressure 5.4.

SC Okay. All (garble).

SC Turn off the light for a minute.

PAO Heart rates in the 70's for all three crew-
men.

SC (garble).

SC Vents all closed.

PAO Heart rates now in the 60's with Dave Scott
occasionally dropping down into the 50's.

SC 3.

SC (garble)

SC (garble) Jim.

SC Rog.

SC That and the ACM, okay? That will hold steady.

SC Yeah.

SC Suit is reading about one and a half above cabin.

SC Blood pressure is running about 59.

SC I'll pump it down a little bit.

SC (garble).

SC Okay. (garble) valve is closed. SCS is closed.

SC Houston, 15. The suit circuit looks pretty
good up here. How does it look to you?

CAPCOM Roger, 15. It looks good to us down here.

SC Okay. Thank you.

SC SC is done. 603 done verify.

SC Have to pump it down first.

SC Okay. Purge valve.

SC Got it.

SC (garble).

SC Rog.

SC Pull the OPS down there, would you Jim?

SC Hold it.

SC Hold it up furthur.

APOLLO 15 MISSION COMMENTARY 8/5/71 GET 241:27 CDT 10:01 657/2

SC Got it.
SC (garble).
SC (garble).
PAO The back of the Lunar Module Pilot Jack
Schmitt is joining the group at the CAPCOM console.
SC Got it.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/5/71 GET24147 CDT1021 658/1

SC This is GARBLE. O2 coming up. Back. Okay.
I'm pressurizing. Okay. Right.
SC Okay, map 3.
SC Okay stable at 39.
SC (garble) Turn that off.
SC Yeah, go ahead.
SC Got it. Okay.
SC It's off. Locked. High and you've got the
temp. Can you reach it? Hook that strap in for me too, would you
please?
CAPCOM 15, Houston. We note that your cabin pressure
is up to 6. You might consider dumping it down.
SC Roger, Houston. Tell me when GARBLE any one.
SC Yeah.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET24152 CDT1026 659/1

CAPCOM Okay.
SC Reading 4 0.
CAPCOM Okay.
SC It's off. Warning tones on. Decay
was about .1. It's on. 0 2 (garble) on. Reading 40 stable
Off. Reading 300. Okay Houston, 15. We've got a
good integrity check n the pan B and standing by for a go
for depressurization.
SC Dave. (garble) turn my (garble) around, please.
CAPCOM We copy 15. And you have a go for
depress.
SC Roger. Are they vertical now?
SC Other side too.
SC Two of 'em.
SC Yea.
SC Okay. You guys ready?
SC Okay Houston, 15. The (garble)
dump valves coming open.
CAPCOM 15, Houston. Copy.
PAO Cabin pressure coming down.
SC Rog.
SC Want to stop there?
SC Okay. Think it's probably easier than
I can -
SC Reading 4 0.
SC Go to 'em.
SC Yea, it does.
PAO Cabin is 1 and a half pounds per square
inch.
SC 3, 38 on mine.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/5/71, CDT 10:33, GET 241:59, 660/1

PAO Half a pound cabin pressure now.
SC Roger. Fine.
SC Okay.
PAO Suit pressure 4 pounds.
PAO Cabin two tenths.
SC Yeah. It makes a difference; it's still
flowing into the cabin.
SC How can you read me? You read me okay?
SC Good.
SC You hear my VOX cut in and out?
SC (garble)
SC Yeah.
PAO Heartrates: Worden and Irwin in the 70's,
Scott in the 60's.
SC Okay. You ready?
SC I suspect that STUs forward enough to keep
it there.
SC (garble)
SC (garble) in the yellow?
SC No. we've missed it.
SC Yeah. I can't see it jumping (garble)
indicator.
SC I can't either, can you?
SC Stand by one.
SC (garble)
SC Houston, 15. We're getting ready to open the
hatch. How does everything look to you down there?
CAPCOM Roger, Al. Everything's looking good like
it ought to be.
SC Okay?
SC Unlatch, unlatch. Ready?
SC Rog.
SC No.
CAPCOM 15, Houston. We don't see the TV camera on
yet.
SC Huh. Oh, we haven't got it out yet. We'll
have it out there in a minute. It should be on now.
SC Okay. I got the latch --

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET 242:04 CDT 10:37 661/1

SC Look, we haven't got it out yet. We'll have
it out there in a minute. It should be on though.

SC Okay, I've got the handle - the handle and
latch.

SC Rog.

SC Rog.

SC Okay.

SC Okay, just a second.

SC Clips.

SC Jettison bag 1.

SC And jettison bag number 2.

SC Okay.

PAO We're getting a picture now.

SC Okay, Houston. You should be getting a
picture about now.

CAPCOM Roger, 15. We're getting a signal.

SC Okay.

SC Okay, fine.

SC First thing is that the mapping camera is all
the way out.

SC Okay.

SC Okay.

CAPCOM 15, this is Houston. We're getting a clear
picture now, but the aiming of the TV camera is poor. Is it
possible to open the hatch wider?

SC Yeah, we're looking at that, too. Stand by
1 and we'll do that.

SC Yeah, I can see the TV is pointed right at the
Command Module there. Right at the interface.

CAPCOM That's affirm.

SC I'll push it back a little there, Joe.

SC Okay.

CAPCOM That's excellent.

SC Okay, you should have a picture of a man in
space.

CAPCOM Very good.

SC Okay, you ready, Jim? I'll work my way down.

SC (garble) 4.

PAO Distance 171 000 miles.

SC We'll have your picture back in a minute, Houston.
We're turning on the 16 millimeter.

CAPCOM We copy.

SC Okay.

SC Okay, I'm in the front restraint.

CAPCOM Yes, it's good work up there, Al.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET1043 CDT24210 662/1

SC Okay, the pan camera cassette is severed/ There's
the pip pin.

PAO Worden's heart rate about 130 now.

PAO Irwin's heart rate 116, Scott's 71. There's
the film cassette.

SC Set inside there for the pan, Jim.

SC Set it inside.

SC Okay.

SC Rog - would you like to exchange - would you
like to get hold of it?

SC That's the pan camera right. Okay Houston.
The pan camera is safely inside. Over.

CAPCOM Beautiful job, Al, baby. Remember, remember
there is no hurry up there at all.

SC Rog, Carl, I'm enjoying it.

PAO Going back for the mapping camera cassette now.

SC Okay Houston, rest break.

SC We'll take a look at the V over H sensor.

CAPCOM Very good.

SC Uh huh, I see nothing on the V over H sensor. There
are no black paint missing. There is nothing obscuring the
field of view. The glass is not cracked. The shield is not
obstructing the field of view. There is nothing in the way,
Carl.

CAPCOM We

SC Perfectly clear.

CAPCOM We copy your report Al, thank you.

SC Okay, and as I look around the mass spec is
oh, it looks like about not quite -

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET 242:15 CDT 10:48 663/1

SC Not quite in. The cover -- it looks like maybe it's the cover that's jammed. Yes, in fact, it is the cover that's jammed. See?

CAPCOM Roger, Al. We copy. That was most unexpected news.

SC I can't tell from here.

SC I can't really -- I can't really tell from here, Carl. Whether it's the cover or not. I thought the cover was jammed. One corner of the cover is overlapping a side section of insulation which I wasn't expecting it to, but it doesn't seem to be -- it doesn't put any force on the -- on the mas spec. If I could get around and take a look at it.

SC The mass spec is in the guide pin and the mass spec looks like as it is fully retracted. The mas spec is fully retracted, Carl.

CAPCOM Roger, Al. We're reading you loud and clear.

SC Any diffi -- any difficulties with the talkback has to be associated with that cover because the cover is not closed.

SC How far through the slot should the guide pin come on the -- on the reel?

CAPCOM Stand by, Al.

SC Okay. Cause I could see a guide pin coming through.

SC You do that and I'll get the map -- mapping camera.

PAO Worden's heart rate 97 now.

SC Okay, Jim. I'm ready to bring the other one back.

CAPCOM Hey, Al. It looks like you're running a pass up there. That's beautiful.

PAO And there was the mapping camera cassette.

SC Okay.

SC (garble).

SC Jim you look absolutely fantastic against that moon back there. That is really a most unbelievable remarkable thing.

SC Okay, Houston. The mapping camera cassette is inside.

CAPCOM We copy.

SC Houston, is there anything else you want me to check in the SIM Bay before we go back in?

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET24220 CDT1053 664/1

SC Houston, is there anything else you want me to check in the Sim Bay before we go back in.

CAPCOM Al.

SC Is there anything on the mapping camera I can check.

CAPCOM Al, we'd be pleased to have any general comments you had about the Sim Bay experiments otherwise than what we specifically asked you. Did everything look in order?

SC Okay. Well everything looked good as far as I can tell, all except for the cover on the mass spec, and the fact that the mapping camera is up. Maybe I could make another quick check back here and see if I can see anything on the mapping camera.

CAPCOM Rog.

SC Okay. You ready you guys?

SC Alright.

PAO Wordens heart rate 85 now.

SC Oh, just a second. I've got get the mask, get the TV.

SC Okay, TV coming in. Got it Dave.

SC Okay. Okay, take your time. I'm doing fine. Okay. Hold up. (garble)

SC Yea, it's about the same place it was when we opened the hatch.

SC Okay, hatch is locked. Neutral. Gear box is in latch. Can you do it Dave. Okay.

CAPCOM 15, Houston. You can turn off the TV anytime you like.

SC Let us get pressurized first Carl.

SC Okay.

SC Can you get it there.

SC Okay. Very good.

SC Okay.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/5/71, CDT 10:58, GET 242:25, 665/1

SC Tell me when to close it.
SC Close it. Take it down here before it's too -
okay, okay, okay.
PAO Cabin pressure coming up now.
SC Okay. Closed.
SC I can't.
SC Yeah. That's okay, Jim.
SC How's that? There we go. Now we should
see if our positions are -
SC You see it now Dave?
SC Okay. Make sure we got a good field.
SC And, Houston, 15. It looks like we got a good
field. How's it look down there?
CAPCOM 15, Houston, your field looks good to us.
SC Okay, thank you.
SC Is the one open.
SC It's open.
SC Okay, 10 now Dave?
SC Rog.
PAO Cabin pressure 2 pounds.
SC Should have stayed longer.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET 242:30 CDT 11:02 666/1

PAO The cabin's at 2.3 now, they'll bring it up to
3 pounds using the spacecraft system. Then they will dump
the OPS, the Emergency Oxygen backpack that Al Worden carried
with him. They'll dump that at 3 pounds to bring the cabin
pressure on up.
CAPCOM 15, Houston. As long as we have the TV camera
on. Go to average and we should get a better picture down
here.
SC Well, it's down in the (garble) sort of stowed
away, but we'll do that.
SC We're just not in the position to get the
camera for you right now.
CAPCOM We copy, and that's fine.
SC You may have something on your picture, now.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET24235 CDT1107 667/1

PAO That's the hatch window in the background there.
SC Cabin pressure rate is coming up.
SC We're out of lockup.
PAO Cabin pressure is up to 4-1/2 pounds per square inch and the consensus in the control center is that that was reflection of lights in the cabin that you saw in the hatch window. Heart rates for Worden and Irwin now in the low 70's, for Dave Scott, high 50's.
PAO The cabin is up to 5 pounds per square inch.
PAO Apollo 15 distance from Earth now 170172 nautical miles. Velocity 3,016 feet per second.
SC Roger.
SC Got it.
PAO This is Apollo Control. The EVA clock here in Control Center recorded 39 minutes 56 seconds.
SC Why don't you do it so I'll get my (garble) Get my helmet. Get that stuff (garble).
PAO And that time is about -- from about midway during depressurization to midway in repressurization.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET 242:45 CDT 11:18 668/1

CAPCOM 15, Houston. We see your cabin at 6.1. You might want to keep a close eye on that.
SC Okay, we'll do that. Thank you.
PAO This is Apollo Control. We have some unofficial times on some of these EVA events. The GO for depressurization was given at 241 hours 55 minutes 33 seconds. Depressurization started at 241 56 12, hatch open 242 05 33, Worden going out the hatch 242 07 29, hatch coming closed, 242 25 20 and the pressure - cabin pressure starting to come back up at 242 27 25.
SC Houston, 15. We're prepared to manuever to the thermal attitude a little early if you'd like us to go over there.
CAPCOM 15, this is Houston. That would be fine with us.
SC Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/5/71, CDT 11:27, GET 242:54, 669/1

CAPCOM 15, Houston. We'd like to have AUTO on the high gain and go from react to auto quickly.

SC Roger. Going auto. Over.

PAO This is Apollo Control at 243 hours 02 minutes. Apollo 15 now 169 526 nautical miles from earth. Velocity 3031 feet per second. Weight 26 509 pounds.

CAPCOM 15, this is Houston.

SC Go ahead Houston. 15.

CAPCOM After some discussion down here, we'd like to disable your jets A2 - alpha 2 and Bravo 1, mainly because the mapping camera's still out and our concern is that the plume will be deflected down into the SIM bay and possibly damage some of our electrical wiring or some of the N2 plumbing, which may give us other problems.

SC Rog. Sounds like a good idea. If there's any other particular configuration you want, just let us know.

CAPCOM Roger.

SC And A2 and Bravo 1 are disabled.

CAPCOM Thank you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET24346 CDT1219 670/1

PAO This is Apollo Control at 243 hours 58 minutes. The crew of Apollo 15 busy stowing equipment, reconfiguring the cabin, very quite time as far as communications are concerned. Apollo 15 now 167 882 nautical miles from earth. Velocity 3 070 feet per second. And the clock showing 51 hours 12 minutes to landing.

SC Houston, 15.

CAPCOM 15, go ahead.

SC Rog. The OPS pressure is 10 thousand and we'll be off comm for about 5 or 10 minutes here while we reconfigure the suits and everything.

CAPCOM We copy.

SC Go.

CAPCOM 15, this is Houston.

CAPCOM 15, this is Houston. How do you read?

PAO This is Apollo Control at 244 hours 35 minutes. The Apollo 15 crew apparently still off the communications system as they are reconfiguring their cabin. We're showing cabin pressure holding at 5.7 pounds per square inch. Temperature 68 degrees.

CAPCOM Apollo 15, this is Houston. How do you read?

CAPCOM Apollo 15, this is Houston. How do you read?

SC Houston, Apollo 15. We'll start to charge on battery B now if you're ready.

CAPCOM Roger 15, we're ready for the battery charge and while we're about it, the experimenters are getting a little fidgety about the waste water dump because that will impact their mass spectrograph work, so we would like to get the dump and the O2 fuel cell purge started also.

SC Rog, we'll get on it right away.

CAPCOM And 15, whenever Al has a couple of minutes, we have a few questions about the Sim Bay that we'd to debrief on.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET 244:46 CDT 13:20 671/1

CAPCOM And 15, whenever Al has a few minutes, we have a few questions about the SIM Bay that we'd like to debrief on.

SC Okay, give him another 15 to 20 minutes here.

CAPCOM Rog.

CAPCOM This is Apollo Control at 245 hours. Apollo 15 picking up velocity, getting closer to home each second. Endeavour is now 166 043 nautical miles from earth, velocity 3115 feet per second.

CAPCOM 15, this is Houston.

SC Houston, 15. Go ahead.

CAPCOM We need to make a small change in the flight plan because they're is a need now to turn the Xray Experiment on. If you'll go down to that group of steps at 245-30, we'd like to do 4 of them. We'd like to get the data systems switched to ON, we'd like to disable the jets, we'd like to get S-band OX-TV Science.

SC Stand by 1.

CAPCOM Rog.

SC Okay, go ahead.

CAPCOM Roger. Four of those steps down to 245-30 we want to do right away, if possible. We want to get the S-band OX-TV to Science. We want the data ON switch to ON. We want to disable all jets ACCEPT, and we want Xray Experiment ON.

SC Okay, understand. At 45-30 245-30, you want S-band OX-TV to Science, data system on to ON and disable all jets and Xray Experiment ON immediately.

CAPCOM That's correct.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET245:16 CDT1350 672/1

CAPCOM Apollo 15 this is Houston. We're having some ground problems in communications networks and we'd like to have a COMM check. Apollo 15 this is Houston. How do you read?

SC Houston 15. Loud and clear and got your first message, Karl. I'm sorry.

CAPCOM Hi Al. Yeah, we've got some sort of problem on ground circuits here. Just wanted to make sure we were in contact with you.

SC (garble)

CAPCOM Roger, very good. Al we have some questions for you on the SIM Bay experiments whenever you have some time to answer them.

SC Okay Karl, tell you what, I'll give you a call back in about 10 minutes when I'm ready.

CAPCOM Very good.

PAO This is Apollo Control at 245 hours 30 minutes. Apollo 15s distance now 165,125 nautical miles. Velocity 3,137 feet per second.

CAPCOM 15 this is Houston.

SC Houston, 15. Go ahead.

CAPCOM Roger just sending up a reminder about the X-ray pointing attitude which is due very soon now and the activation of the SIM Bay experiment.

SC Okay Karl, thanks.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET 245:36 CDT 14:10 673/1

CAPCOM Apollo 15, we'd like to have OMNI Alpha.
SC Rog, OMNI Alpha.
SC Houston, 15.
CAPCOM Go ahead, 15.
SC Okay, Carl. I'm ready to talk SIM bay but
first, a couple of questions.
CAPCOM Fire away.
SC Okay. What attitude do you want us to do the
UV photo -- photography at.
CAPCOM Roger, Al. The information on UV photos is
to follow the procedures. -- okay, you want the attitude --
procedures on page 3-352 and the attitude to be used is 210,
242, 322.
SC Say the attitude again, please.
CAPCOM 210, 242, 322. Also note use of magazine P
and also the time that we start -- the time that we finish
the manuever is 247 plus 45.
CAPCOM And let me clarify that magazine. That is
the magazine for the UV color for photographs. That is magazine
P instead of magazine M.
SC Okay. Understand. Use the procedures on
page 3-352 except change the attitude to 210 242 and 322 and
this whole thing is to be done at 247 45.
CAPCOM Roger. That's the time for completing the
manuever.
SC Well, what time would you like us to manuever
to that attitude then?
CAPCOM Roger. The time to start the manuever is
247 -- 247 plus 36.
SC I understand. 247 plus 36, right. Thank you,
Karl.
CAPCOM Okay, Al. Are you ready for the SIM bay
questions?
SC Roger, Karl. Sure am.
CAPCOM Okay. First of all, the guys down here would
like send up there warmest congratulations on such a successful
EVA. You sure made it look easy up there.

END OF TAPE

CAPCOM done such a successful EVA you sure made it look easy up there. And the questions, the questions we got are about the mapping camera and they're directed at the general problem of is there, was there anything you could see which might indicate why it jammed, and there are three particular items that you might have looked at. First of all, it was the main camera cover at the bottom of the camera, was it touching or scraping the camera in anyway, that you notice?

SC The answer to that is negative. In fact I checked it, I checked the mapping camera cover laser altimeter cover quite carefully to make sure because I do know that there have been some interference problems with that before, particular with the pan camera, so I was looking at that in particular to see that it was maybe adjusted to close or interfering along the side of the pan camera, and it was not. There was about half an inch clearance between the upper edge of the cover and the body of the mapping camera, so that, I don't see that that was responsible for the thing jamming.

CAPCOM Roger. I think you've very clearly put that suspicion to rest. There are also two covers to the solar camera in the upper left side of the mapping camera and did you notice any, any distortion or any scraping in these covers? There's one possibility the one that stuck out to the left, it might have jammed and the screw jack that controls it might have twisted it or distorted it. Was there anything you noticed like that.

SC Negative, Karl. I noticed nothing out of place with the mapping camera, nothing interfering, I checked all the way around it, down into the cavity, nothing interfering I saw no evidence of anything interfering, and it looked clean underneath, so I don't think there was anything blocking it from underneath. I don't know, my distinct impression after surveying the mapping camera and looking around the cavity where the mapping camera fits was that there is a problem when it's in drive.

CAPCOM Roger, you didn't see anything inhibiting it's motion, not even the electrical cables up on the top.

SC Negative, and I guess I can ask a question along that line. Has anyone noticed any high current when we've gone to retract on the mapping camera, to indicate that it wasn't hanging up.

CAPCOM We didn't see any Al, although there had been a long controversy down here about the long amount of time required to extend in retract. It was, even though it was about the 4 minutes predicted several months ago, it was some what longer than what we had observed at the Cape. People have been worrying about that for some time.

SC Yea I realize that, and I also, as I recycle back to what we saw at the Cape, there was some problems with that thing hanging up in drive itself at the Cape.

CAPCOM Roger. Okay, a couple of questions on the mass spectrometer, you gave us some good information there, but when you said the mass spectrometer cover wasn't completely closed, could you give us some idea as to what degree it had closed, to what angle and was there any possible cocking, any twisting in that cover.

SC Well, I couldn't tell where there was any warpage in the cover or not, particularly because that kind of a cover is a little bit - it looks like its warped anyway. It looked to me, I pulled the cover out of the way enough to look at the mass spec inside and I could see the guide pin and along the sides of the carriage coming through the holes all the way up so that they were plainly visible from the outside which meant to me, the mass spec was either very close to being seated on the carriage or it was seated. I guess I don't really know how far those guide pins extend out beyond the carriage. The other thing was that the cover the Inconel cover was rotated about 30 degrees on its hinge point from a full close position, and I thought at first as I indicated when I was there that there looked like there was some interference in one of the outer covers or one of the outer edges but after playing with that and pulling it a little bit when I was out there, it was quite obvious to me that that wasn't the problem either and beyond that I couldn't see down around beside the cover enough to tell whether there was something internal between the cover and the mass spec, that was binding the cover.

CAPCOM Roger Al, we copy that and would you open the x-ray and Alpha covers right now please.

SC Okay, x-ray Alpha covers coming open.

CAPCOM Okay, I guess you've answered most of our questions on the mass spec and you've approached one -

END OF TAPE

CAPCOM Okay, I guess you've answered most of our questions on the Mass Spec, and you've approached the one that we might get a little more out of, and that is those guide rails sticking through the guides. There is a tapered portion, and when it is completely seated, you actually see the cylindrical portion beyond the tapered portion. Did you actually see the cylindrical portion or was it all tapered area that you looked at on the guide rail?

SC Okay, that's good scoop. All I saw was the tapered area.

CAPCOM Roger. If - If it was fully seated, you would have seen about 1/2 inch of the cylinder there, and this is a good indication that it was not all the way seated even though it was close. Here's a couple of other questions. Give me a second to look at them.

SC Okay.

CAPCOM Okay, Al. Most of the questions here are about the contamination status and things in the SIM Bay. First of all, how about the door edges? Did they blow off smoothly and cleanly?

SC Yes, very cleanly. I saw no rough edges at all.

CAPCOM Stand by a moment, Al.

SC Okay.

CAPCOM Now, we're anxious to bring up the high gain antenna. I've got a couple of angles here if they will help.

SC Okay.

CAPCOM Minus 76 and 117.

SC Okay, minus 76 and 117.

CAPCOM Okay, we copied your comment on the SIM Bay door jettison and further questions go as follows. The white coatings in the SIM Bay were - did you notice that any of them were obviously discolored or coated from contamination or overheating?

SC I saw no evidence of heating in the SIM Bay. I saw no evidence of discoloration on the white surfaces, and as best I could tell, no particular matter that had come to rest on any of the surface in the SIM Bay. It looked very very clean. And even across the top of the mapping camera where there was such a heating problem expected, I found no indications of heating, whatsoever. Particularly on things like the cover over the mapping camera cassette, which was supposedly a very hot spot, and it was just as clean as a whistle. There wasn't any evidence of scorching or contamination, anywhere, that I could see.

CAPCOM Roger. And on the insulation and foils, I guess there is a question here about "Were any of them burned or discolored." You probably already told us that. Were any of them torn or were there any attachment failures?

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SC No, I couldn't see any evidence of any burning or tearing or anything else back there, Karl.

CAPCOM Okay, we got 1 more general question there, and our Flights Dynamics Officer who is vitally concerned about our reentry weight would like to know whether we jettisoned more or less than a nominal 32 pounds and if so, by how much?

SC Okay, stand by 1.

SC Say, Houston. We talked it over, and I guess we'd say it was pretty close to a nominal, as far as weight, we have no

END OF TAPE

SC Say, Houston, we've talked it over and I guess we'd say it was pretty close to a nominal - as far as weight - we have no idea of determining exactly what the weight was, but we're going to try and work our reentry storage over this afternoon and tomorrow morning and we hope to give you a plan by somewhere around noon tomorrow, where all the rocks are stowed and where everything is stowed and what we have on board. So you can start - so Mr. Fido can work up his entry plan.

CAPCOM Roger, and if somebody has time to copy it, I've got a small flight plan update available now.

SC Okay, Karl. I'll take that.

CAPCOM Hi Jim. How're you doing?

SC Just fine.

CAPCOM Okay. 246 hours 20 minutes we have high gain angles of pitch 00, yaw 240. At --

SC The 00 and 240.

CAPCOM Roger. And at 246 plus 46, we want to add change discriminator to low.

SC Understand. Scratch discriminator high and make it discriminator low.

CAPCOM That's correct. And on 247 plus 28 delete that DAP load.

SC Okay. We already have that change.

CAPCOM Sorry about that. On 247 plus 30, we'd like to have the Alpha X-ray covers closed; then off and delete the note on the cover open/close.

SC Okay. Understand. At 247 30 you'd like Alpha X-ray doors closed, and just delete the note here.

CAPCOM Roger. Stand by 1 second.

CAPCOM 247 plus 30. Also, we would like to add mass spectrometer multiplier high, discriminator low.

SC Understand. At 247 30 you want to add mass spec multiplier high and discriminator low.

CAPCOM Rog. And at 247 plus 32, we'd like to have mass spec multiplier high, discriminator high.

SC Okay. 247 32 mass spec multiplier high and discriminator high.

CAPCOM Roger, and I guess you need to save room, if there's any left there, because at 34 and at 36 we want to change these two switches again. At 34, we want mass spec multiplier low, discriminator high.

SC Understand. At 34 you want multiplier low and discriminator high.

CAPCOM Affirmative and at 36, we want multiplier low, discriminator low.

SC Okay. At 247 36, it's multiplier low and discriminator low.

CAPCOM Affirmative. Also, at 247 36 is, add UV photos and we've already sent up the changes required for that; the changes over and above what's on page 3-352, and there's one reminder there and that is to verify that when

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CAPCOM you use filter 2, that you take one frame
for 20 seconds and one frame for 2 seconds.

SC Roger. We remember that.

CAPCOM Okay, the next step is 247 plus 45, X-ray to
stand by.

SC Okay, at 247 45 X-ray to stand by.

CAPCOM And, at 247 plus 50, we want to move the PTC
initiation steps from 247 30 to 247 50.

SC Okay. Understand. The initiation of PTC to
be delayed to 247 30 to 247 50.

CAPCOM That's affirmative. At 248 hours and 0 minutes,
we'd like the following: we'd like the mass spectrometer boom
retraction sequence. Each retraction step will last 20 minutes,
instead of 12, and terminate this test at 249 plus 30.

END OF TAPE

SC Go back to 248, Karl, and then mass spectrometer
the electrometer boom retraction sequence.

CAPCOM Roger.

SC I have that in there.

CAPCOM I guess all we're doing there is changing.
The retractions step will be 20 minutes instead of 12 minutes.
Down at the end of the writing there, it says each sample
period will last 12 minutes. We'd like to have that at 20
minutes.

SC Okay. I'll change the note there then it
occurs about 248 20. This 12 will be 20.

CAPCOM That's correct. At 249 05, we'd like to
move the mass spec boom deploy from 05 to 30. From 249 05
to 249 30.

SC Understand. Move the mass spec boom deploy
from 249 05 to 249 30.

CAPCOM Roger. And one final one at 251 48, which
you may already have, is delete the DAP load there.

SC We have that one, Karl.

CAPCOM Okay, that completes the update. Thank you.

SC Thank you.

CAPCOM 15, Houston. We'd like to have gamma ray
gain step up 4 clicks.

SC Okay. That's gamma ray gain step up 4 clicks.

SC Adrift comtec net one.

SC Adrift, comtec, this is Houston comtec.

Voice check. How do you copy?

SC Roger. I read you loud and clear, how me?

CAPCOM Roger. Read you the same. Good circuit.

PAO This is Apollo Control at 246 hours 15 minutes.
Apollo 15 now 163766 nautical miles from Earth. Velocity
3171 feet per second. This is Apollo Control at 246 hours,
20 minutes; Apollo 15 is maneuvering now to the X-ray pointing
attitude.

END OF TAPE

PAO This is Apollo Control at 246 hours 36 minutes. The high voltage has been turned on on the subsatellite, everything is normal and the vehicle is considered fully operational.

CAPCOM 15, this is Houston. We trust you will be pleased to hear the news that the high voltage has been turned on to the subsatellite, and that they find that all systems are operational.

SC Oh, that's very good. Glad to hear it.

PAO This is Apollo Control at 246 hours, 59 minutes. Apollo 15, is 162,429 nautical miles from earth, velocity 3,204 feet per second, and the clock counting down, shows 48 hours 11 minutes till landing. In the control center, flight director, Glynn Lunney, and his team preparing to relieve, flight director, Gerry Griffin, and his team of flight controllers. The capcom on the next shift will be astronaut, Bob Parker. We estimate the change of shift news conference for 4:15 PM central daylight time in the news center briefing room.

CAPCOM 15, Houston, we have a couple of more comments on the UV photo procedure, if somebody can copy.

SC Go ahead, Karl.

CAPCOM Roger, we overlooked the fact that you are taking these photos in the midst of SIM Bay operation, so a couple of little things change. Going back to page 3-352, you can first of all delete below the damp rates notation, you can delete inhibit all jets, except the jets that are there, and just keep the jet configuration you've got right now.

SC Okay, I copy that, do you have any other comments?

CAPCOM Roger, under remove the CM5 window, put in there CMC free, and likewise, about 4 lines up from the bottom, just above note, put in CMC auto, and the final comment, enable all jets, you can delete that. And that's all.

SC Okay, understand, just below remove CM5 window cover, put CMC free, and then down at the bottom there just above the note, put CMC auto, and scratch, enable all jets.

CAPCOM Roger.

END OF TAPE

SC Houston, 15.
CAPCOM 15, go ahead, Houston.
SC Dr. Parker, I presume. Listen Bob, we got to pull the gamma ray to 15 feet at 50 and wonder if you've got an updated retraction time for us.
CAPCOM Confirm, Al, we have a retract time of 247 plus 50 for 72 seconds. Over.
SC Understand, 72 seconds.
CAPCOM That's affirm. And 15, if you got your Flight Plan out, we can update a couple more times in that same general vicinity for you.
SC Okay, the Flight Plan is out and the door is open.
CAPCOM Okay, at 24802 the mass spec boomer track time, that should be 33 seconds, and that time will apply to the first retraction, the second, third, fourth, and fifth retractions will be 32 seconds. Over.
SC Okay Bob, understand that the first retraction is 33 seconds and the succeeding retractions will be 32 seconds, is that 4 or 5?
CAPCOM Stand by.
CAPCOM Apollo 15, Houston. That will be 32 seconds for all succeeding ones and we are going to do that up to 249:30 and so all succeeding ones you get will be at 32 seconds and we will finish that test at 249:30 no matter where we are, and I believe I see the call was sent up comment that the sample period would be 20 minutes instead of 12, is that right?
SC That's roger, we have that.
CAPCOM Okay, and another change at 249:36, the gamma ray deploy, that time will be 63 seconds. Over.
SC Copy 63 seconds.
CAPCOM Okay, that's all we have for right now.
SC Okay, thank you, Bob.
PAO This is Apollo Control. Flight Director Glynn Lunney is completing his mission status review with his Flight Controllers at the present time. We're about to begin the change of shift press briefing and that briefing will be held in the briefing room of the MSC News Center. At present time, Apollo 15 is 161,117 nautical miles from the earth and the spacecraft velocity is 3,237 feet per second.
CAPCOM Apollo 15, Houston. Request OMNI Delta, please.
SC Roger, OMNI Delta.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/05/71 24800 GET 1634 CDT MC 680/1

PAO This is Apollo Control at 247 hours, 59 minutes. During our change of shift briefing, we had no conversations with the crew; it's been quiet in Mission Control and we're standing by live at this time.

CAPCOM Apollo 15, Houston, over.

SC Houston, 15, go ahead.

CAPCOM Roger, 15, if you guys will give us a hack when you start the first mass spec retraction, we'll keep an eye on those 20 minute periods for you.

SC Okay, good deal.

SC Bob, we just completed one retraction for 33 seconds.

CAPCOM Okay, we're starting our time. Apollo 15, Houston, over.

SC Go ahead Houston.

CAPCOM Roger, 15, we'd like to get a pitch of minus 4.0 and yaw of 90 for the high-gain antenna. And then if you'd change your antenna switch to high-gain without hitting the command reset switch, we'll maintain calm that way, please.

CAPCOM Apollo 15, Houston, over.

SC Go ahead Houston.

CAPCOM Negative, you did the right thing without us calling you, thank you.

sc Whatever that was, okay.

PAO This is Apollo Control. The crew, at the present time, is setting up their digital auto pilot and this will damp out the rates of the spacecraft, set it up in a stable position just prior to starting it rotating at the rate of about 3 revolutions per hour. And this is the condition that the spacecraft will be in during the sleep period to maintain the proper temperature and the proper thermal equilibrium. Prior to beginning the sleep period which will be a 9 hour rest period, the crew will also run a Program 52 which is a platform alignment, aligning the stable platform used by their guidance and control system in the spacecraft as an attitude reference, and will also take a series of sightings on 3 different stars as part of a mid-course navigation exercise using Program 23. During this period of time also, they have alternately extending and retracting the boom which holds the mass spectrometer as the spectrometer moves alternately closer and farther from the service module bay, it allows the principal investigator to gather data on the cloud of contaminants that presume to follow along with the spacecraft, and to construct from this a stratification model of this contamination cloud. Once the model is constructed, then this data can be used to interpret the scientific results that are gathered with that instrument. At 248 hours, 12 minutes, Apollo 15 is 160,000 nautical miles

APOLLO 15 MISSION COMMENTARY 8/05/71 24800 GET 1634 CDT MC680/2

PAO from the earth and the spacecraft velocity is down, now, to 3262 feet per second; actually now, we're watching the velocity increase but very slowly and will continue to do so reaching its maximum shortly after entry interface where it'll be at about 36,000 feet per second or a little more.

CAPCOM 15, Houston, your rates look good to us for spinup.

SC Okay, Bobby.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET 248:16 CDT 16:50 MC681/1

CAPCOM 15, Time for the next cycle on the mass spec 32 seconds.

SC Okay, we were a little ahead of you that time.

CAPCOM Rog.

CAPCOM Apollo 15, Houston. Over.

SC Go ahead, Bob.

CAPCOM Roger, if you guys are for the moment free, we'll pass up three comments to you preparatory to some stuff you want to do later on.

SC Yeah, go ahead.

CAPCOM Okay, first there's a reminder that we're counting on using the OPS to pump up the cabin for sleep tonight, another way of bleeding off the OPS. Guess we'll remind you now so you don't stow it away down underneath where it's inconvenient. And we'd like a readout on the OPS after you finish pumping up the cabin tonight. Second comment is a reminder that we'd like a Q on the vacuum cleaner. If you intend to use it for this contamination control period coming up in a half hour or so and third one is that as far as the medics are concerned, it's dealer's choice on who wears the biomed tonight. Over.

SC Okay, we copy, Bob.

CAPCOM Apollo 15, Houston, over.

SC Go ahead, Houston.

CAPCOM Roger, we'd like to confirm auto auto off on the O2 heaters, it looks like we've gone beyond the point where they should have come on.

SC They're all off right now, Bob.

CAPCOM Rog, that explains what we are seeing. Rog, we'd like auto auto off, please.

SC Understand, auto auto off.

CAPCOM Thank you.

SC Houston, 15.

CAPCOM All right, go ahead 15.

SC Okay, just wanted to clear up the O2 heaters with you, are you aware that the last instruction that we had of the Flight Plan was at 243:30 that said O2 heaters 3 off?

CAPCOM Standby that wasn't on my shift.

SC You're not the regular crew chief, huh?

CAPCOM 15, Apollo 15, Houston. That call at 243:30 is the O2 heaters to tank 3 only.

SC Okay Robert, I stand corrected. That's one I owe you.

CAPCOM 15, you called.

SC Negative, negative.

CAPCOM Apollo 15, Houston. It's retract time.

SC Thank you Bob.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET 248:42 CDT 17:16 682/1

CAPCOM And Apollo 15, Houston. It's time to retract again.

SC Okay, thank you.

CAPCOM And 15, be advised that this is the last retract we will do. We will not do the fifth retract in order to assure that we don't damage the filament by getting it in too close. We'll sit in this retracting position for 30 minutes and then deploy the mass spec boom as per the flight plan at 249:30. Over.

SC Okay, understand.

PAO This is Apollo Control at 249 hours 27 minutes. Apollo 15 is now 157,700 nautical miles from the earth. Traveling at a speed of 3,322 feet per second. The crew at this time should be about to get something to eat. Following the eat period they'll be aligning their platform, the guidance system stable platform used in attitude reference. And will also be taking some star sightings using program 23 for midcourse navigation. During the rest period which is scheduled to begin at 252 hours 32 minutes or about 3 hours from now, the gamma ray alpha particle and mass spectrometers will be operating, gathering background data to be compared with the information collected in orbit around the moon.

CAPCOM Apollo 15, Houston. About 2 minutes to mass spec boom deploy. And we'd like a Delta-T on the length of time it takes to deploy it, please.

SC Roger, Bob.

END OF TAPE

SC Bob, the flight time on the mass spec was 3 and 25.

CAPCOM Roger copy 3 plus 25, Jim.

SC Roger.

CAPCOM Apollo 15, Houston. While you're eating your supper there, I thought you might be interested in knowing how the vectors had gone. Your vector and the grounds vector are extremely close, and, at least at the moment. We'll see what happens when we take the next P23. Right now we're looking at no midcourse 6 and about 1.8 foot per second for midcourse 7.

SC Houston, 15, that sounds pretty good and it looks like we'll see what happens on the P23. You say 1.7 on midcourse 7, is what it looks like right now.

CAPCOM Roger, 1.8, the vector is, I guess right now, about 4,000 feet apart and about a couple of feet per second in velocity, and no more.

SC Sounds great.

PAO This is Apollo Control. We've still got about 5 or 10 minutes left in the crew eat period. They'll be finishing up their evening meal before completing the last activities, prior to their sleep period. That'll be a platform alignment, and some midcourse navigation. A little while ago, spacecraft communicator, Bob Parker, told the crew that it did not appear at this time, that we would have to do a midcourse correction at the midcourse correction 6 opportunity, which is in about 22 hours, at 272 hours, 58 minutes. Possibly a small midcourse correction will be required just prior to entry at 291 hours 58 minutes. However this would, at the present time, appear to be only about 1.8 feet per second velocity change, which would be well within the capacity of the reaction control system thrusters. It probably would be a 2 jet burn, using just 2 of the attitude control thrusters. One of the clocks in mission control at this time is counting toward splashdown, 44 hours 35 minutes from now, and the flight dynamics officer, reports that the spacecraft appears, at this time, to be comfortably within the entry corridor, with an entry angle at - entry interface of about, negative 6.69 or 6.7 degrees. The normal, or preferred is about 6.5, but 6.7 is considered within the entry corridor. Tomorrow at 11 AM, there will be a briefing in the MSC news center briefing room, on the subsatellite and the x-ray experiment. That will be at 11 AM, Houston time tomorrow. Apollo 15, at the present time is 155,500 nautical miles from the earth, and the spacecraft velocity is 3,382 feet per second.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET 25038 CDT 1912 684/1

CAPCOM Apollo 15, Houston. We can terminate battery
bravo charge now.

SC Houston, 15. Roger, we'll do.

CAPCOM And 15, Houston. A reminder that when we
exit PTC in about 15 minutes, we'd like to do it using the
SIM BAY RCS configuration.

SC Roger, Houston. Understand.

CAPCOM 15, this is Houston. We have your torquing
angles, that's some platform, isn't it.

SC Yes sir, Bob. You bet it sure is beautiful.

CAPCOM Apollo 15, Houston. Over.

SC Houston, 15. Go.

CAPCOM Roger. Mister lightning fingers, we'd
appreciate it if you'd keep your NOUN 49 on for about 5 sec-
onds on this P23 so we get a nice chance to look at it here
on the ground.

SC I will do my best, sir.

PAO This is Apollo control. Al Worden is presently
using program 23 to update the spacecraft guidance systems
knowledge of the trajectory. Taking sightings on stars and
marking. This information is integrated into the computer
memory and is used to update the state vector or the trajec-
tory information contained. This is the last task that the
crew has to perform prior to beginning their rest period, and
just before deploying the gamma ray boom. During the sleep
period they will be in passive thermal control mode with the
gamma ray, alpha particle, and mass spectrometers collecting
data.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET 251:38 CDT 20:12 MC685/1

CAPCOM Apollo 15, Houston. Over.
SC Go ahead Houston, 15.
CAPCOM Super marks, Al, you can do my P23's any
day.
SC They looking okay down there Bob?
CAPCOM Rog, we caught all of them. Hey, when you go
back into PTC now, we'd like to change noun 79, the rate one
anyway, to a minus .42. Over.
SC Going to try a little higher one now, okay,
minus .42.
CAPCOM Roger.
CAPCOM And 15, Houston. If you got a minute we
got a couple more comments for you.
SC Okay, anything I need to write down?
CAPCOM Negative.
SC Okay go ahead.
CAPCOM Number one, we'd like to know the film
status of magazine Victor, and number two, if you're planning
on being the loop tonight Al for the biomed, your harness
needs some attention. The heart rate that we're getting
down is getting a little noisy. Over.
SC Well in the first place, my heart rate is
always noisy, and in the second place I guess Jim is going
to be on tonight.
CAPCOM Understand.
SC Houston, 15.
CAPCOM 15 Houston, go.
SC Okay Bob, mag Victor is 12 frames expended.
CAPCOM Copy, 12 frames expended. Thank you.
CAPCOM 15, Houston. We suggest that you go ahead
with your gamma ray deployment while you're doing your
rate damping.
SC Roger, Houston.
CAPCOM And 15, Houston, if you feel like it, we
can take your E mode now. And 15 we have your E memory dump.
SC Okay, good.
CAPCOM 15 Houston, we're go for spinup for PTC.
SC Okay good.
SC Houston, Apollo 15.
CAPCOM Apollo 15, go.
SC Hi Bob, got a presleep checklist for you.
CAPCOM Shoot, we're ready. Dave, hold on, we got
a
SC Okay.
CAPCOM Okay 15, we're back with you, we just had a
slight changeover.

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SC Okay, crew status is all good, no medications, and I've got the onboard readouts if you got a pencil.

CAPCOM I got a pencil.

SC All righty. Starting with Bat C 37.0, 37.0 37.0, RCS A is 56 B is 50 48 and 52, and I guess everything else has been done and I guess you got your E memory done. We pressurized the cabin with the OPS and when we got to about 57 or 58 the OPS was down to 800 and I reckon that's the size of it .

CAPCOM Roger, Dave, that sounds like the size of it to us, we copy all that and there will be no vector update, ground says your vector is just as good as theirs right now.

SC How about that, I don't know, that's pretty good, we got a good navigator.

CAPCOM And 15, let's hold a couple of minutes while we check some data on SIM Bay and we will go around the MOCR one more time and we'll be back with you in final status I hope.

SC Okay, we got time, we're not quite ready to go to bed yet.

END OF TAPE

CAPCOM Apollo 15, Houston, the only thing we show lacking at the moment is gamma-ray gainstep - shield on. Other than that, you're GO for sleep.

SC Okay, understand, gainstep shield on.

PAO This is Apollo Control at 252 hours, 35 minutes. The crew is scheduled to be in their sleep period at this time. However, Dave Scott mentioned a few minutes ago that they still had a few things to complete before they tried to get some sleep. We'll keep the air to ground lines up live until it appears from the biomedical data that the crew is in fact beginning to drop off to sleep at which time we'll take the lines down, keep the recorders running to record for playback any conversations that should develop unexpectedly. Apollo 15 at the present time is 151,632 nautical miles from the earth and the spacecraft velocity up now to 3485 feet per second. During the sleep period, as is normally the case, the spacecraft will be rotating at a slow rate to maintain proper temperatures. Tonight, that rate just a tad higher than it's been rotating at the rate of about 4 revolutions per hour instead of the normal 3 to 3 and 3/4. And we understand this is being done because the booms supporting the mass spectrometer and gamma ray spectrometer are deployed. The Lunar Module Pilot, Jim Irwin, will be wearing the biomedical harness during the sleep period tonight; we'll have heart and respiration rates on him which will be our indicator that he is beginning to sleep and by inference that the crew is dropping off to sleep.

PAO This is Apollo Control at 253 hours, 30 minutes. It appears at this time that the crew is either asleep or beginning to drop off to sleep. Jim Irwin on whom we have biomedical data this evening has been asleep for about the past 30 minutes. We plan to take the air to ground lines down leaving the recorders up to record any conversations for playback. And we are going to replay the video tape in the News Center from today's EVA. Apollo 15 at the present time is 149,755 nautical miles from earth traveling at a speed of 3536 feet per second. All the systems on the spacecraft are continuing to operate satisfactorily. The scientific instruments module experiments have been operating since departure from lunar orbit and good data is being obtained. The camera cassettes, of course, from the pan and mapping cameras were retrieved today by Al Worden during the extra vehicular activity. The Apollo lunar science experiment package left at the Hadley base site is also functioning well; power from the radio-isotope source thermo electric generator is remaining at a constant 74.1 watts. And we're monitoring the temperature on the central station electronics at 112.8 degrees. The passive seismic experiment continues to record the venting

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PAO of the lunar module descent stage. We're also noticing the characteristic wobbling that is apparent as the instruments settles out; these disturbances are gradually decreasing in amplitude. And an analysis of experiment data indicated that the Apollo 15 station recorded a seismic signal, probably a meteorite impact beginning at 21:25 Greenwich Mean Time on August 2. The lunar surface magnetometer experiment is also operating normally, continues to measure magnetic fields as the moon passes in and out of the tail of the magneto pause. We're also getting normal operation from the solar wind spectrometer experiment. And the heat flow experiment appears to be performing normally with all of the temperature sensors returning data. The thermocouple temperatures indicate a lunar surface temperature of about 192 degrees Fahrenheit. At this time, we will take the live air to ground line down and we'll be feeding the audio from the, along with the video from the television of the EVA today. At 253 hours, 34 minutes, this is Apollo Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/5/71 GET 254:29 CDT 23:03 687/1

PAO This is Apollo Control at 254 hours 29 minutes. And the crew has now been asleep for about an hour and a half. We have about 7 hours remaining in their sleep period. And just a few minutes ago Flight Director Glynn Lunney checked with his flight control team on the status. The reports from around the room are generally about the same. All looks quiet and everything is looking good. Apollo 15 at the present time is 147,745 nautical miles from the Earth, and the spacecraft is traveling at a speed of 3,591 feet per second. We will continue to provide status reports hourly. The air-to-ground lines are down but we do have tape recorders running, and should we get any unexpected calls from the crew we'll play those back for you shortly afterwards. At 254 hours 30 minutes, this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/6/71 GET 256:34 CST 1:08 MC 688/1

PAO This is Apollo Control 256 hours 34 minutes ground elapse time in the mission of Apollo 15. Heading homeward at 3 714 feet per second. Still 143 341 nautical miles out from Earth. Splashdown is in the North Central Pacific 38 hours 36 minutes away. Crew is still asleep at this time. No recent communications. They have 4 hours and 54 minutes of their scheduled sleep period remaining. Milton Windler's Maroon Team is taken over for the graveyard shift here in the Control Center. The spacecraft slowly rotating in the passive thermal control mode; which for the people here in the Control Center, is rather like watching the grass grow. At 256 hours 35 minutes ground elapse time, this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/6/71 0300 CDT 258:26 GET 689/1

PAO This is Apollo Control at 258 hours 26 minutes. Some other times, 3 hours and 3 minutes remaining in the Apollo 15 crew rest period. Splash down some 36 hours 45 minutes away. Apollo 15 spacecraft Endeavour now 139 283 nautical miles out from earth. Velocity building up very gradually, now 3831 feet per second. Current vector shows the ground elapse time of entry interface Saturday of 294:58:06 velocity at the entry interface would be 36 097 feet per second. All these numbers concern with entry and splash down will change back and forth over the next day and a half. Crew apparently in fairly deep sleep at the present time according to flight surgeon. Spacecraft rotating about the longitude and axis in the barbaque roll -- passive thermal control mode. All spacecraft systems are in excellent shape, operating nominally. No problems with spacecraft or crew. At 258 hours 28 minutes this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/6/71, 6:03 CDT, 261:29 GET, 690/1

PAO This is Apollo Control 261 hours 29 minutes ground elapsed time. Should be coming up on crew wakening here momentarily. Spacecraft communicator Joe Allen will be giving the crew a call followed by some wake-up music. The spacecraft, meanwhile, is 132 367 nautical miles out from earth, velocity 4038 feet per second. The spacecraft communicator is checking the weather room display for a forecast for the landing area which calls for scattered clouds and good visibility. And looks like he's getting all set to wake the crew up.

CAPCOM Good morning, Endeavour. This is Houston.

SC (garbled) Good morning.

CAPCOM Good morning, Dave. A little something special for your LMP from your lunar lift-off flight director with young Ed Fendell on the cimbal.

SC I'll bet he's standing at attention right now.

CAPCOM Roger. We copy that.

CAPCOM Endeavour, this is Houston, with our first request of the day. We'd like the X-ray spectrometer ON, please.

SC Roger. Coming ON.

CAPCOM Okay, Dave. And I've got high gain antenna angles for you when you accept PTC.

SC Okay. Stand by one, Joe.

SC Okay. Go with your high gain angles.

CAPCOM Roger. High gain pitch plus 24, yaw 264. And, Dave, I've got CSM consumables if you're interested in copying those.

CAPCOM GET 261 plus 00, RCS total 38, quad A 42, 39, 32, 38, H2 tank 34, 32, 33, O2 tank 49, 50, 40. And there's a note on that which reads, Fat City. Over.

SC Yes, man. I guess so. That's pretty even, isn't it?

CAPCOM Yes, sir.

CAPCOM And, Dave, a comment - -

SC What a machine.

CAPCOM Roger. A comment, you're being served now by the MOCR shift that witnessed a new endurance for Apollo flights being set during the night.

SC Oh, that's interesting. We'd forgotten about that.

CAPCOM And, Endeavour, I'll be standing by for when you're ready to copy down the few changes in your flight plan for today. I can bring you up to date over the next 7 hours or so and get all that out of the way. I'm also curious to know if you've had time to listen to any

APOLLO 15 MISSION COMMENTARY, 8/6/71, 6:03 CDT, 261:29 GET, 690/2

CAPCOM sea chanties from the HMS Endeavour up there. Over.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/6/71 GET 261:37 CDT 6:11 691/1

SC No. We haven't had a chance to, Joe. Stand by and I'll get my trusty pen after we get through with this (garble) on the PTC and we'll do the flight plan.

CAPCOM Okay, fine. You should ask your trusty record librarian, Al, where the sea chanties are, if you have time today.

SC Okay. We were talking about that last night. It came to the realization that we brought all these neat things along and we hadn't had time to listen to a single one of them.

CAPCOM Not at all surprised to hear it.

SC I'll tell you, yesterday we finally got a chance to catch our breath.

CAPCOM We always said the hours are long.

SC (garble) The hours are long but the accommodations are aplatial.

CAPCOM Was that the way it went, Dave?

SC Sounds like you've recovered from all that - the couple of last few days too.

CAPCOM Very nearly.

SC Houston, this is 15. Standing by to copy flight plan update.

CAPCOM Roger, Jim. Good morning. The first -

SC Good morning, Joe.

CAPCOM ... entry should be at 261:42. And it is a change in the first register of the DAP load, the time column we want that to read, lll 01. Over.

SC Give me the time again on that, Joe.

CAPCOM Roger. 261 plus 42.

SC Okay at 261:42, I don't see any DAP information. I see one on 261:35.

CAPCOM I may have done it again, Jim. Let me see. Stand by on that. Let's continue on with some of the easier steps. At 262 plus 05, it - that's 262 plus 05 at gamma ray gain step, 2 steps.

SC Understand. At 262:05, gamma ray, 2 steps.

CAPCOM Roger. And at 263:55, under the line NOUN 70 et cetera, add X-ray to stand by. And at 263:59 delete the VERB 48 line and the DAP load over in the time column.

SC Okay at 263:55, we'll add a step there after NOUN 70, X-ray to stand by and then at 263:59 we'll delete the VERB 48 also delete the DAP load from the time column.

CAPCOM Roger. Turning the page to 264:02, the
DAP - -

END OF TAPE

CAPCOM Load in the time column should read, 111 01.

CAPCOM And at 265 the DAP load status in the note column should read, 111 01 x 111, and this continues through for 2 hours. Over.

SC Okay. Understand that 264 00 time column changed the DAP load there from all ones to 111 01 and then in 265 the DAP load will be changed the same way. You continue for 2 hours.

CAPCOM That's correct, Jim. And moving on to 266 30 delete the gamma ray gain-step to shield on line.

SC Okay. 266 30 to eliminate the gamma ray gain-step.

CAPCOM Roger. Moving to 267 plus 20 add the 2 steps gamma ray boom retract, talkback barber pole for about 2-1/2 minutes, then gray and then off. And the second step, gamma ray gain step to shield on.

SC Okay. Understand, there are two steps there. The first one is gamma ray retract barber pole for about 2-1/2 minutes then gray and then turn it off. Second one is gamma ray gain step to shield ON.

CAPCOM That's correct. Moving to 267 plus 42 change the DAP load in the time column to read 111 01 x 1111. Over.

SC We understand, from all ones to 111 01.

CAPCOM That's correct. Turn the page to 268 02 DAP load in the time column the same change.

SC Okay. I copy.

CAPCOM Okay. On the same page 268 30 gamma ray gain step 5 steps.

SC Understand, gamma ray gain step to 5 steps.

CAPCOM That's correct, Jim. Now looking at page 3-378 the UV-photos trans-earth coast. A couple of changes there. About half way down the page where it reads 2 frames filter 2 exposure time 20 seconds. Delete that line, and add the line the 2 line one frame filter 2 exposure time 20 seconds, 1 frame filter 2 exposure time 2 seconds.

SC Okay. I have that. Joe. It's kind of our standard change in the UV procedures.

CAPCOM That's correct, Jim. And, the mag-metro under the configure camera section should be changed to read mag-papa.

SC Okay. Understand mag-papa.

CAPCOM Okay, Jim. And the last one for you, a biggie, turning over 4 pages to the sextant photo test, strike the line PCM table.

SC Okay. Eliminate PCM table on sextant photo test.

CAPCOM Roger.

SC Should we go back now to the very first one?

CAPCOM Jim, I knew you were going to ask that. The first one, I guess, was a small typographical error, and there's no change required there. And, please don't tell

APOLLO 15, MISSION COMMENTARY 8/6/71 CDT 6:26 GET 261:52 692/2

CAPCOM Dave about it. He's keeping score against
me.

SC Okay. (chuckle).

END OF TAPE

CAPCOM Jim, I knew you were going to ask that. The first one I guess was a small typographical error and there is no change required there and please don't tell Dave about it. He's keeping score against me.

SC Okay.

CAPCOM Endeavour this is Houston with a forecast weather report for your landing area. They're calling for a high scattered, 2 000 scattered, 10 miles vis, winds about 15 knots out of the east, northeast, waves going to 4 feet and we're predicting no midcourse 6 correction for trajectory reasons. From the weather report none is required for weather reasons. Over.

SC Gee, that sounds pretty good, Joe. Except we saw a movie about that weather stuff once.

CAPCOM Roger, we copy that. And Dave, we do have one question. Is it true that nothing can stop the Army Air Corps?

SC That's true, Joe. That's true.

CAPCOM I'm beginning to believe it.

SC Well, that means you're just about qualified.

CAPCOM I'm glad you still have reservations though. Your GAMMA by the way is right on 6.5. It's as close we can tell right now.

SC Well, that's pretty good. Must be compensating errors along the way somewhere.

SC Say Houston, 15.

CAPCOM Go ahead.

SC We reviewed our entry stowage last night. We're going to do the stowing this morning and in the process why we came up with one extra little bag up here, which we're labeling LM return items, which is essentially the samething as 14 brought back. And I wondered if you might check with our good Fido and see if he wants the details of that or whether maybe Ed Mitchell can give you the general kind of items and that would be exceptable, but we have one, one bag, which I'm sure you're aware of, and we'll stow it and tell him exactly where we stowed it and if he wants the details well we'll give it to him.

CAPCOM Okay, fine, Dave. Copy that. And pass that information along. I have the morning news report if you're interested in listening.

SC Roger. Everybody's hooked up and listening. Go.

CAPCOM Roger. This is the news for 6 August, 1971. In the first round in the American Classic at Firestone Country Club, Akron, Ohio, the leaders are Jerry Heard and Mike Hill, both with 3 under par 67's. Arnold Palmer shot a 70 and Nicklaus a 73. The U.S. built its Gold Medal total to 50 in the Pan Am. games and they're entering their second week now. Cuba is a distant second with 17 Gold Metals, but

APOLLO 15 MISSION COMMENTARY 8/6/71 GET 261:59 CDT 6:34 693/2

CAPCOM a cuban set a world record yesterday in the hop, skip, and jump. The record was 57 feet 1 inch. We're coming up on the first full weekend of national football exhibition games and New Orleans' Saints play the Buffalo Bill's. Dallas' Cowboys play the L.A. Rams. And these two games are the beginning of an 11 game weekend. I've got the baseball scores, American League East, Yankee's beat Baltimore 5 to 0, Boston over Detroit 5 to 4, American League West, Kansas City over Minnisota 7 to 4, and Oakland edged out Milwaukee 2 to 1. The National League, Chicago over San Diego, 3 to 0. Pittsburg beat Montreal 7 to 2, and Houston 0, Dodgers 3. The government reports today the latest figures in the nation's unemployment problem and one private economist predicts the jobless rates probably will show still another rise. Five days after the steel industry and Union agreed on a new contract without a strike, tens of thousands of steel workers had been laid off and the hearths are cold as users consume steel strike preparedness stock piles. William Martin, Jr., who reorganized the New York stock exchange 33 years ago proposes an overhaul of the entire securities industry. We want to interrupt here. If we could have ACCEPT, please, we'll provide you with a new state vector. The Senate shelves until September 13 that compromise draft extension bill which President Nixon wants now and when it comes up if --

END OF TAPE

CAPCOM We want to interrupt here. If we could have ACCEPT please, we'll provide you with a new State vector. The Senate shelves until September 13 a compromise draft-extension bill which President Nixon wants now. And when it comes up it will, quite possibly, face a filibuster. The U.S. Middle East expert Joseph Sisco concludes "practical and concrete" (and those are in quotes) talks in Israel. He says no decisive breakthrough was achieved and he didn't expect any. The Middle East cease-fire, which went into effect last August 7, hasn't ushered in peace but it has suspended Israeli-Arab fighting. The last 12 months have been the best year for Israel since 1967 and the euphoria induced by results of the six-day war. A government study says Americans will spend more than 105 billion for medical care in 1974, and even the most ambitious federal health insurance proposal would add less than 12 billion to the tab. Congress is set to embark on a month-long summer vacation after the Senate completes action on a measure keeping federal agencies in business until October 15. That's good news. And, a, an added word which could be a Science update; you may have heard yesterday, but let me repeat it anyway. We've had very clean laser returns off the LR Cube, which is located at Hadley Base. In fact, very good and immediate returns from that. Also, as you know, we have a good subsatellite orbiting the Moon, and are getting data from all the experiments onboard that. Over.

SC Oh, that's very good news Joe. Thank You. We hadn't heard about the LR Cube, but we were hoping it was super-clean.

CAPCOM Roger; and it's your computer.

SC Rog.

CAPCOM And, an added a note for Al. Alfredo, I'm not sure if you got a report on your bi-static radar experiments. Taylor Howard got very clean echos on both the S-band and the VHF frequencies; and he's busy analysing that data right now.

SC Very good, Joe.

CAPCOM Endeavour, this is Houston with a final update concerning the Trusty LCRU on the Lunar Surface. We turned it on yesterday, and it worked beautifully for about 13 minutes. We were panning around, zooming in and out; got a few more good pictures of the surrounding mountains, and suddenly we lost the PM Downlink. In fact, we lost everything in a very short time, about 1 sixtyth of a second; almost as though someone had turned it off. We tried, we waited awhile and tried to reactivate it, and did such things as send signals back to us to pan around while we looked carefully on the passive seismometer for evidence of motion; apparently it was not responding to the signal. The temperatures were completely normal right before it went off the air. We're not exactly sure what happened. Over.

SC Gee, that's interesting Joe. I guess it completely went off and just didn't get hung up some where.

CAPCOM That's right, Dave. It wasn't a mechanical problem. We most likely popped a circuit breaker or something like that. It's a little difficult to sort out.

SC Would you like us to go back up and check it for you?

CAPCOM Knew you were going to ask. Stand by.

SC Joe, I'm interested to hear you say that the temperatures were normal. One of the things, of course, we'll be briefed on when we get back. But Jim and I both noticed that each successive day was warmer than the preceding day. And on the last day, if you felt your hand or something in 1 position for any period of time, it would really - the suit would really heat up on that particular surface. And I'm surprised that the system went this long with that temperature up there. I suspect it really got pretty hot.

CAPCOM Dave, that's interesting comment. By normal, I guess I mean within limits. It apparently was about 90 degrees on the LCRU and about 90 degrees - 92 degrees on the camera when it gave up the ghost. However, that's well within its limits and we don't think that circuit breakers or whatever let go because of the temperature. The one thing that we did not have sensed, as I understand it, were the back temperatures of the Rover that was feeding the power into the TV, however.

SC Gee 92 sounds pretty cool.

SC It does, I would have guessed much hotter than that. That's a pretty good thermal system on it if it kept the temperatures down that low.

CAPCOM That's correct.

SC Or maybe - Jim mentioned - maybe that's centigrade huh?

CAPCOM Negative on the centigrade, Dave. However, when we turned the camera off at the end of EVA 3, the temperature was up around 122 degrees.

SC Yeah, I'd believe that, easily.

END OF TAPE

CAPCOM Endeavour, this is Houston. The Surgeon reports that we have good respiratory data from your biomed volunteer, but we have evidence that one of the three EKG leads is open circuited, either not attached or broken somewhere. And sometime over the next few hours we'd like - we'd like you to troubleshoot this for us please, and, if need be, there is an extra biomed harness in the medicine kit. Over.

SC Roger. Okay. We'll check into that.

CAPCOM Endeavour, we have the angles.

SC Rog. Houston.

CAPCOM Good Ship Endeavour, this is Houston. We'd like a crew status report at your convenience, please.

SC Rog. Stand by.

SC Okay, Joe, I have the crew status. We all got 8 hours sleep; VRD readings were: Al was 25031 and mine was 08042 consumables at 26100; RCS total 38, quads 42 32 39 and 38, H2 34 32 and 33, O2 49 50 and 40. Over.

CAPCOM Okay, Jim. Thank you.

PAO This is Apollo Control at 263 hours 25 minutes ground elapsed time. Shift change underway here in the Control Center. Spacecraft now 127 788 nautical miles inbound toward earth at a velocity of 4181 feet per second.

CAPCOM Go ahead 15.

SC Roger. We've researched the EKG and appreciate a checkout from the docs down there.

CAPCOM Roger. Standby.

SC Good morning Karl.

CAPCOM Good morning Al. How are you doing?

SC Just fine.

CAPCOM Says the EKG looks good down here.

CAPCOM Hold one.

SC Okay.

END OF TAPE

CAPCOM Al your new capcom is just coming up to speed this morning . I understand that there has been a problem with the bio-med harness and they want to know if the one you have on right now is the one that gave trouble shortly before.

SC That's affirmative and I did find the loose one.

CAPCOM Okay, we're getting a good signal on you and I guess that information makes everybody happy down here. Thank you.

SC Okay.

PAO This is Apollo Control at 263 hours 52 minutes. The crew is performing a series of Cislunar navigation star sightings and Apollo 15 is 126 706 nautical miles away from earth. Velocity 4 215 feet per second.

CAPCOM 15, this is Houston. We still have a concern about your OPS pressure and would appreciate if it's at all accessible to have a reading at the present time.

SC Okay, it's pretty well buried right now Karl, what's your concern with it?

CAPCOM Well, first of all, they's anxious that the OPS pressure be down close to zero at entry, and they'd like to figure out how much their going to use tonight and how much tomorrow night in order to bring that down. I guess we don't have it tomorrow night, they are anxious to know whether or not it's, we're going to be able to bring down it's pressure in using it tonight.

SC Okay. I guess it came down to 800 from 2 thousand last night, but probably came back up. Soon as we get a chance to do some shuffling around here, why we'll check it and give you a call.

CAPCOM Good enough. Thank you.

SC Rog. It's sort of down in the bottom of the pile right now, and we're getting ready to start re-entry stowage so we'll be able to get to it in a little while.

CAPCOM We understand.

CAPCOM Al, the way people talk down here, they're going to give you a medal for good sightings up there. They say that the gamma from this last series of sightings was 6.55 whereas the value we have down here is 6.50.

SC Roger, Karl.

SC Houston, 15. You may have seen an excursion there as we started the VERB 49 maneuver to PTC and we're trying to figure it out.

CAPCOM We copy.

CAPCOM 15, Houston. We didn't see any obvious glitches down here but we're going to go back and look at the data.

APOLLO 15 MISSION COMMENTARY 8/6/71 GET26328 CDT0802 696/2

SC Okay. What happened was we were load-
ing Noun 22 for the Verb 49 and apparently on the last entry
on the third register we got about a 1 degree per second
pitch down pitch rate and went to SCS and then back to CMC and
tried it again and it worked just fine.

CAPCOM Roger.

SC Houston, it looks like we might have
got that old 22 degree glitch in the CDU.

CAPCOM We copy.

SC And Houston right now we're reading
about 93, 93 and 334 -

END OF TAPE

SC And Houston. Right now we're leading about 93 93 and 334 on the ball.

CAPCOM Roger.

CAPCOM 15, this is Houston. We feel that we can get rid of that discrepancy if you'll do a verb 40, Noun 20.

SC Okay, we'll do one of those.

SC Yep. It looks like that's what it was.

CAPCOM Dave, we suspect the cause of that glitch back there was probably due to the fact that you might have loaded a noun 20 instead of a noun 22. Is that possible?

SC We're thinking. Stand by.

SC Karl, I guess it's a possibility but we're both looking at it and I guess we don't think so, but that's a distinct possibility.

CAPCOM 15, Houston. About all we can say is that everything is looking fine at the moment and we'll go back and look at the data. We haven't had a chance to do that yet.

SC Yeah. Roger. Understand. It looks fine up here and that could have been the problem.

SC Houston, 15. Talking it over. I guess that must have been a noun 20 load because just as I remembered the CDU which is in current increments of 11, and 11 plus 11 doesn't equal 26, I don't think.

CAPCOM Okay, we copy.

SC And Houston. In our present attitude, a yaw CDU change would be converted to a pitch rate so that sort of all adds up.

CAPCOM Very good.

CAPCOM 15, Houston. When you have some time to listen, I have a couple of sentences of comments on the procedure for the light flash experiment.

SC Okay. Why don't you stand by till we get our trusty crew all lined up and ready to go.

CAPCOM Very good.

CAPCOM Incidentally, Dave, as we line them up, one of the changes is that we would like the cabin lights bright this time.

SC Oh, you like the lights bright? Okay.

CAPCOM 15, Houston. We see indications that the optics aren't zeroed and we'd recommend that you zero them with the reminder of course to bring the angles down to 10 degrees -- less than 10 degrees before you zero.

SC That's standard procedure. We'll get it. Thank you.

END OF TAPE

SC Okay. That's standard procedure. We'll get it.
Thank you.

SC I see it had been written up on the panel for
about 8 days now or so.

CAPCOM Very good.

SC Okay Houston. Go ahead with your procedures on
the light flash.

CAPCOM Roger. We'd like to have you put the window
shades on as usual but leave the cabin lights bright and
what we're going to do is to sort of calibrate one crewman
in terms of the degree of a dark adaption required to see the
flashes and it would be interesting to know. After you don
the eyeshades and give us a mark and go ahead and count things -
after a while you - one of you and we prefer you, Dave, just
to be specific, can expect for us to call up to you to take
off the eyeshade for 1 minute and after a minute we'll do the
timing for you, if you like. We'll tell you to put it back
on and in this minute's time look around at the lights, get
back to sort of - your eyes normally adjusted then put on the
eyeshade again and give us marks as you start seeing things
and that's the only difference from the normal procedure. We
would prefer to have all the data on the voice downlink if
possible.

SC Okay understand the open the eyes. Stand by
one. And Houston we talked over the downlink bit and it's
just impractical if we're all going to try and keep up with
the comments on where and what we see would just be too
confusing for you, and I think if you cannot get your data
from the tape we'll do that. But, I think it is much more
practical to go ahead and put it on the tape, and just in-
form you of when we get the marks.

CAPCOM Okay, we've had - we've had some trouble with
the tape in the last couple of times around is the reason
the people are sort of saying hey if we could possibly get
it down in real time we'd feel happier.

SC You mean you cannot get the data off the tape,
huh?

CAPCOM I guess we've been having trouble with voice
quality on the DSE and Jerry just now says hey let's check
it right now. See how it's doing and we'll let you know in
the next few minutes as to what's preferable.

SC Okay. That's a good idea.

CAPCOM 15 this is Houston. It looks as though the
DSE voice downlink is acceptable now and we'll do it your
way.

SC Okay. Let us get squared away here and make
sure we get all the shades up.

CAPCOM 15 one more comment on that DSE voice problem.
This is to some extent dependent on how well your mikes are
adjusted so make sure that they are in a good position.

SC Rog. I guess a downlink would probably be the
same problem. We'll get them all squared away.

APOLLO 15 MISSION COMMENTARY, 8/6/71 GET26422 CDT0856 698/2

SC Houston, 15.

CAPCOM Go ahead 15.

SC How do the rates look for PTC now?

CAPCOM Just got the word that they look good for
spinup.

SC Okay.

CAPCOM I think that is another great example of ESP
at work.

PAO This is Apollo Control, 264 hours 34 minutes.
Apollo 15 now establishing a 3/10ths per second rotation,
3/10ths of a degree per second rotation, for passive thermal control.
Shortly the crew will begin the light flash experiments again.
The marks on this experiment will be put on the onboard
tape recorder. It will not be on the air to ground.

SC 15 we're experimenting.

CAPCOM Roger.

PAO Distance is 124,934 nautical miles. Velocity
4,272 feet per second.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/6/71, 9:15CDT, 264:41GET, 699/1

SC Houston, 15. We're still here; it just looks like a quiet morning.

CAPCOM Roger. Glad to know that you're still awake. Keep on looking for the cosmic rays.

SC Looking as hard as we can.

SC Mark CDR.

SC Mark LMP.

SC Mark CDR.

SC Mark CDR.

SC Mark CMP.

SC Mark CMP.

SC Mark CMP.

PAO This is Apollo Control at 265 hours 10 minutes. The Apollo 15 crew has about another 10 minutes left in the light-flash experiment. They're recording this data on the onboard tape recorder. Although obviously every once in a while the command module pilot keys the air to ground when he takes a mark; you can hear that. Apollo 15 now 123 490 nautical miles from earth. Velocity 4320 feet per second. We're 30 hours away from landing.

SC Mark CMP.

SC Mark CMP.

SC Mark LMP.

SC Mark CMP.

SC Mark LMP.

SC Mark LMP.

SC Mark LMP.

SC Mark CMP.

SC Mark CMP.

SC Mark LMP.

SC Mark LMP.

CAPCOM 15, Houston. Be advised the DSE just ran out tape. If there's anything significant to be said from here on in, say it on the air to ground please.

SC Okay. Will do.

SC Mark LMP. Flash, 4 o'clock about a quarter of the way out. Intensity 3.

SC Mark CDR. Right eye. A streak from about 3 o'clock to 6 o'clock. Intensity 2.

SC Mark CDR. Point source; right eye, 12 o'clock half way out; intensity 2.

SC Mark CDR. Right eye; point source; 7 o'clock about half way out; intensity 2.

CAPCOM 15 this is Houston. We find an hour's passed now and we thank you very much for the data, and there's a --

END OF TAPE

CAPCOM 15, this is Houston. We find an hour's passed now and we thank you very much for the data and there's a general question. Since the counting rate was less than previously, is there -- is there any impression that you have that the intensity may have been less than previously also. The intensity of the individual flashes.

SC Rog, I think that'll be a general comment that all three of us experienced. And Houston, also, you might note that we all saw flashes last night when we went to sleep -- just before we went to sleep and I guess -- We feel there's a surprising decrease in numbers and intensity today.

CAPCOM Roger, we copy that you feel today's frequency is less than last night's and also, that the intensity is less today.

SC Rog, that's correct.

CAPCOM Thank you very much for the free information.

SC Okay.

SC Houston, this is 15.

CAPCOM Go ahead, 15.

SC Looking back at 264 16, there's a call out there to close the mapping camera cover, we did not do that because the extension of the mapping camera.

CAPCOM Roger. We concur with you that that was the right action. The one that you took.

CAPCOM 15, this is Houston. We'd like to set your mind at ease about that attitude glitch. It was indeed due to loading a noun 20 in place of a noun 22.

SC Okay. Thank you.

PAO This is Apollo Control at 265 hours 57 minutes. Apollo 15 now 121548 nautical miles from Earth. Velocity has increased to 4385 feet per second.

SC Houston, Apollo 15. The OPS pressure is 1000.

CAPCOM Roger, 15. We copy 1000 on the OPS pressure. And we have a suggestion down here that may make the OPS simpler to handle. We'd like to put the hose over it's connector there and simply turn the OPS on to bleed down gradually, and simply replenish the cabin pressure and then you don't have to bother with operating it tonight.

SC Rog. That's sounds like a pretty good idea. Okay, we'll do that.

CAPCOM Rog. And then everybody will be completely satisfied that it's bled out by the time you reenter.

PAO This is Apollo Control at 266 hours 17 minutes and at 28 hours 54 minutes away from landing Apollo 15 is 120694 nautical miles from Earth. Velocity 4413 feet per second.

END OF TAPE

PAO This is Apollo Control at 266 hours 23 minutes. A briefing on the subsatellite in lunar orbit is scheduled for the MSC News Center briefing room at 11 am to day, central daylight time. This briefing will not be carried on the PAO release line.

PAO This is Apollo Control at 266 hours 50 minutes. Apollo 15 will reach the half way point in distance, from the moon to the earth, at 271 hours 30 minutes 34 seconds elapsed time. At that time the distance will be 106 662.7 nautical miles. Earth referenced velocity will be 4 920 feet per second. The moon reference to velocity, 4 077 feet per second. At this time Apollo 15 is 119 243 nautical miles from earth, and the velocity is 4 462 feet per second.

CAPCOM 15, this is Houston with a couple of comments about the SIM Bay experiments if you're willing to listen.

SC Rog Houston. Go ahead.

CAPCOM First of all, on the gamma ray experiment, Dr Arnold reports that Al Worden probably performed the first recorded repair of a scientific instrument in space, because earlier in that day he'd began to experience some problem with excess noise in the gamma ray experiment, and when Al went out in the EVA we don't know what happened there, but at the end of the EVA, the gamma ray cleared up and it's been doing beautifully ever since. You must have given it a pretty good kick there Al.

SC Well not only is he a plumber, he's an electrician as well.

CAPCOM Roger. On the x-ray spectrometer, the work you've been doing on the galactic sources of x-radiation has, is already showing considerable interest and in particular the Scorpius x-ray 1 data gives us a longer continuous observation of this source than we've ever had before, and shows a fairly long period variation which I should put in a word of caution which still might be instrumental but looks real, and was previously unrecorded and has Dr. Adler rather excited and I'm sure the other astronomers will be much interested also. Indeed we may go back to that source later to day, although I don't think that's clearly decided yet.

SC Rog, that sounds interesting.

CAPCOM And otherwise I guess that, that's about the most exciting news from the SIM Bay

SC Okay.

END OF TAPE

CAPCOM I should put in a word of caution which still might be instrumental, but which looks real and was previously unrecorded, and has Dr. Adler rather excited and I'm sure the other astronomers will be much interested also. Indeed, we may go back to that source later today although I don't think that's clearly decided yet.

SC Rog. That sounds interesting.

CAPCOM And, otherwise, I guess that - that's about the most exciting news from the SIM bay.

SC Okay. Very good. We're ready to talk about entry stowage if you'll get out your map and your little legend there on where things go and we'll run down the line here.

CAPCOM Okay we've - incidentally we've one more comment. On the mass spectrometer, on the retraction sequence yesterday showed us no increase in contamination which was something of a surprise. And it's probable that we might try that once more today to make sure that there wasn't some sort of instrumental difficulty there. Maybe we just have a cleaner spacecraft atmosphere than we thought though.

SC Yeah. But from what Al said when he was looking around out there it sounded to me like things were pretty clean.

CAPCOM Roger.

CAPCOM Okay, 15. If you will turn off your squelch, it will help because we may occasionally have periods when comm is rather weak, and otherwise, go ahead.

SC What we use is in reference is the entry stowage map, spacecraft 112, 26 July 1971, which was in the front of our flight plan, and if you have that in front of you, why I'll just go through that and give you the additions, deletions, and changes, of which there are very few.

CAPCOM Okay. We're - Stand by one moment.

SC Okay.

CAPCOM Okay. Go ahead.

SC Okay. Al is stowed as prescribed there. Top of A1 has a bag - a decontam bag in which we have sample container number 2 for 23 pounds in the LM return items.

CAPCOM Roger.

SC A2 is as you have listed.

CAPCOM Roger.

SC And on top of A2 we have the ISA decontam bag for 64 pounds.

CAPCOM We copy.

SC Okay. A3, A4, A5, and A6 are as you have on your list right now.

CAPCOM We copy.

SC A7 is as you have on your list with the addition of the LM DAC and the LM 70 millimeter camera that failed on the surface, which we thought that you might like to take a look at.

CAPCOM Right. Both of those are added items, I take it.

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SC That's correct.

CAPCOM We copy.

SC Side of A7 is the EVA umbical and bag as to
- to the prescribed.

CAPCOM Rog.

SC Top of A7 is sample collection bag - stand by.

SC Okay. Let me - let me go back and make a
correction here, Karl. Look over in the left-hand column
where it says top of A1 and scratch sample collection bag
number 2.

CAPCOM Okay.

SC And then go back to your right-hand column
and on top of A7 we have decontam bag with sample collection
bag number 2 and the B-SLSS bag for a total of 48 pounds.

CAPCOM We copy.

SC Okay.

CAPCOM Could I clarify that - that both of those
bags together were 48 pounds, or --

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/6/71 GET26716 CDT1150 703/1

CAPCOM Could I clarify that. Both of those bags together were 48 pounds or do I also put over the 23 pounds we had on A1.

SC The total of collection bag number 2 plus the B-SLSS is 48 pounds.

CAPCOM I understand.

SC And you can scratch the collection bag number 2 for 23 off of A1.

CAPCOM Roger.

SC Okay and then NA8 is stowed - with the exception of one less light weight gym which is somewhere on the moon.

CAPCOM Roger.

SC Okay on the side of the next page in the left column on the side of A8 in the bag as you have there with the addition of the core tube pole.

CAPCOM Say again.

SC Okay I figured that would be a strange one. On the side of A8 in bag there are four items there and one additional item has been added. The drill core stamp which we just labeled as a core tube pole because it looks like a pole.

CAPCOM Roger. That's the three foot core stem.

SC That's correct.

CAPCOM Okay.

SC And A9 is collection bag number 3 for 30 pounds.

CAPCOM We copy.

SC B1, B2 and B3 are as you have them listed.

CAPCOM Okay.

SC B5 is rockbox number 1 for 36 pounds and B6 is rockbox number 2 for 40 pounds.

CAPCOM Okay, we copy.

SC And then B5 and 6, B8, L2 and L3 are as you had them listed.

CAPCOM Okay.

SC And R1 is the flight data file and LM PPK.

CAPCOM We copy.

SC And then on the next column they are all as you have them listed. For the top part 2, part 3 and in R3 we have the entire LM data file and we've taken R12 out of R3 and put it in another spot.

CAPCOM Okay.

SC R4 is as you have it as is R5, R6, R8, R11, R13.

CAPCOM We copy.

SC Okay U1 will only have one temporary stowage bag in it.

CAPCOM We copy.

SC U2 will have the items listed plus the assesory bag in which we have the contaminated gloves and I will

APOLLO 15 MISSION COMMENTARY, 8/6/71 GET26716 CDT1150 703/2

SC read you a list of those items if you are
ready to copy.
CAPCOM Okay, go ahead.

SC U3 is as you have prescribed there.
CAPCOM Roger.
SC Stand by one, Karl. Okay, Houston, ready to go
with the right hand column. U4 is as prescribed and (garble)
is as prescribed.

CAPCOM Roger.
SC Okay the PGA bag is as prescribed with the following
additions. First we have in the bag where we will put the
lunar sample, we'll have R12 with the CSM malfunction pro-
cedures and systems book.

CAPCOM We copy. 1 is has number 7 for

PAO This is Apollo Control at 267 hours 35 minutes. Apollo 15 is 117 343 nautical miles away from earth. Velocity 4 528 feet per second. All systems performing normally, and the back up command module pilot Vance Brand has joined capcom Karl Henize.

CAPCOM 15, we have you torquing angles.

SC Roger.

CAPCOM 15, this is Houston. The next several attitudes are going to require us to use OMNI Delta and we suggest that you go manual and wide and stow the high gain antenna.

SC Okay we'll do that going OMNI Delta.

CAPCOM Apollo 15, this is Houston. We'd like to have you retract the mass spectrometer boom for 85 seconds.

SC Understand retract the mass spectro for 85 seconds.

CAPCOM That's affirm, and then we'll leave it there for about 5 minutes. We'll cue you when to extend it again.

SC Okay.

PAO This is Apollo Control at 268 hours 20 minutes. Apollo 15 is 115 361 nautical miles from earth. Velocity 4 598 feet per second. We're 26 hours 50 minutes from landing.

CAPCOM 15, this is Houston. Would you please extend the mass spec boom all the way out again.

SC Roger it worked.

CAPCOM And I have a T-start for the lunar eclipse photo's when you're ready to copy.

SC Okay. Go ahead with the T-start.

CAPCOM T-start for lunar eclipse photo's.
268 59 47.

SC Understand 268 59 47.

CAPCOM That's correct Al.

CAPCOM Al, we had a question on the mass spectrometer and it maybe to late. Was it possible to confirm by visual look through the window that it was retracted.

SC Negative Karl. You can't determine that it's retracted. All you can determine is that it's full out.

CAPCOM Rog, well when it was retracted you wouldn't be able to see it, that's what I'm asking, is it possible for you to take a look now and see if it slowly comes in to view.

SC Roger, in other words you're asking to be confirmed that it does come full out.

CAPCOM That's correct.

SC Okay.

APOLLO 15 MISSION COMMENTARY 8/6/71 GET26725 CDT1159 704/2

CAPCOM Just to clarify our question A1,
the main question was just to confirm whether or not it
did go out of your field of view. Did it actually move
from the full, from the full extended position. Since we
saw no change in the data when we retracted it during the
test yesterday, there is a suspicion that even though you
actuated the switch that for some reason it didn't retract.

SC Understand.

END OF TAPE

SC (garble). In -

SC Okay. It's fully equipped now, Karl. But it may be too late. It may have already been out by the time we looked.

CAPCOM Roger.

CAPCOM 15, this is Houston. We have a rather extensive update to the flight plan, and also, a change to the procedure for the contamination of photos which we can read up to you at your convenience.

SC Okay. Does it involve the things going on here in the next couple of hours?

CAPCOM It's pertinent beginning at 271.

CAPCOM We probably ought to get it in before the press conference at 270.

SC Okay. Stand by one.

SC Okay. Go ahead, Karl

CAPCOM Okay. If you've got the flight plan out, we'll go over to 271 hours. And at 271 20 just under S-Band OX TV Science, we add verb 49 maneuver to contamination photo attitude. The attitude is 014 195 016. High gain, pitch minus 23, YAW 252.

SC Okay. At 171 20 just after S-band OX TV Science per 49 to 014 195 016, high gain pitch minus 25 23 into yaw 252.

CAPCOM Roger. Just after that, we delete mass spectrometer ion source OFF and in the space, there, add configure for urine dump.

SC Rog. Delete the mass spec and ion source OFF and configure for urine dump.

CAPCOM Okay. Delete the next one 1 2 3 4 lines and that brings us to gamma ray gain step shield off which we leave in.

SC Rog. Delete 4 and leave in the gamma ray gain step shield off. Go.

CAPCOM Delete all of the rest of that page. And add, at 271 40, verb 48, 11101 01111 and P52 option 3.

SC Okay. 271 40, verb 48, 11101 01111 and at P52 option 3.

CAPCOM Roger. And at 271 45, we add, gamma ray boom deploy 41 seconds, then off. Gamma ray gain step center and start contamination photos.

SC Okay. 271 45, gamma ray boom deploy 41 seconds then off, gamma ray gain step to center then start the contamination photos.

CAPCOM And there's a note on the photos that you begin to dump according to the photo procedures which are -- I have an update to that I'll give you later. And that we dump the water to 40 percent in order to have the right weight at entry.

APOLLO 15 MISSION COMMENTARY 8/6/71 GET 268:30 CDT 13:04 705/2

CAPCOM Roger. It's important that we don't go below 40 percent on the water dump.

SC Okay. Understand. Dump according to photo procedures and the water dump to no less than 40 percent for entry.

CAPCOM That's affirmative. On the next page 272 hours and zero minutes, we

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/6/71, 13:18CDT, 268:45GET, 706/1

SC (garble) of 40 percent for entry.

CAPCOM That's affirmative. On the next page at 272 hours and 00 minutes, we - I presume you know that we're not doing the midcourse correction 6. We cancelled the P52 there. And we keep the H2 purge line heater on, but we cancel the P30 external Delta V, we cancel the verb 49 maneuver, we cancel the next 1, 2, 3, 4, 5, all the way down to the H2 and O2 fuel cell purge, which we keep.

SC Okay. Understand. Keep the H2 purge line heater, cancel the P52 and the set of lines below H2 line heater on and keep the H2/O2 fuel cell purge.

CAPCOM Roger. And at 272 28, I note that you should be ending the contamination photos at that point.

CAPCOM Begin at 272 38.

SC Okay. 272 38 end contamination photos. Go ahead.

CAPCOM Right. At 42 we cancel - we delete the waste water dump since we've already done it and at 42 we add: start the mass spec boom test and the procedures are to be read up in real time. At 58 we cancel the midcourse 6. At 273 01 we --

SC At 272 46, that's the - hold on. Let me read it back. 272 42 the mass spec boom test procedures in real time and cancel MCC 6. Go ahead.

CAPCOM Roger. At 273 01 we cancel the burn status report and we add: X-ray experiment on. Alpha X-ray covers open, and record the GET.

SC Okay. 273 01 X-ray experiment on, Alpha X-ray covers open, and record the GET. Go ahead.

CAPCOM Roger. At 03 we delete the gamma ray X-ray alpha particle MSO on and down at 273 47 we add gamma ray boom deploy.

SC Okay. A deletion at 273 00 - or 03 the four items there and then gamma ray boom deploy at 273 47. Go ahead.

CAPCOM Roger, and one final item on 274 05 in the mass spectrometer instructions there, the discriminator should be low instead of high.

SC Okay. 272 04 mass spec discriminator low versus high.

CAPCOM Roger. And if you have the time, I can give you the update on the contamination photography, which is on photo 25 and 26 in the back of volume 1 of the flight plan.

SC Stand by one please.

SC Okay, Houston, let's hold off on the updates of those other photos so we can get squared away for the eclipse photos.

CAPCOM Roger.

PAO This is Apollo Control at 269 hours 03 minutes. Apollo 15 now 113 437 nautical miles from earth. Velocity 4667 feet per second. The televised news conference from the spacecraft is scheduled for 270 hours 20 minutes, or 2:54 pm central daylight time.

END OF TAPE

CAPCOM 15 this is Houston. Your astronomer CAPCOM is getting curious to know whether you are seeing anything of the lunar eclipse, anything visible?

SC Oh sure, we've seen it come down to about 1/2 to about 1/5 illumination at the present time relative to the sun's illumination.

CAPCOM Roger, and what percent of the disk is covered now?

SC Stand by. Okay Karl looks like about 9/10 of the disk is covered at the present time and we've been taking the pictures all along. It's a very pretty sight out there.

CAPCOM Roger. Sounds like you are getting close to total eclipse there. Hey, we note down here that in your free mode you are drifting somewhat in pitch and you are about 5 degrees off now. The recommendation is to go auto and stop the drift if you can and cycle back to free before you take your next photo. If there is anything you can do to correct the pointing it might be a good idea.

SC Okay right now those photos are handheld so we'll get to it when we get to the Hicon.

CAPCOM Okay.

SC Houston, 15. The moons in the shadow now and we have a variation in color from a almost a light gray to a burnt orange from one side of the moon to the other, almost like the old harvest moon except that I'm not sure there is any atmosphere up here yet.

CAPCOM Roger. We copy.

SC Houston, 15. We've finished the photos and Al had the moon in the reflex part of the Hicon all the way so I'm sure the pointing was okay.

CAPCOM Very good.

SC Right now the moon is sort of - varies from sort of a very pale orange to a good deep burnt orange on one side and a very gradual change and I hope the photos come out because it certainly is pretty.

CAPCOM Very good. It sounds like a beautiful view from up there. You've seen a lunar eclipse of the moon twice as big as anyone else has ever seen such an eclipse.

SC That was very interesting and it certainly is a pretty view. It'd be a great place for somebody like you to come up and use your trained eye to interpret all this and understand it.

CAPCOM Sounds like it would be fun someday. I see you have your EMS entry check coming up. If there is any chance of my slipping in this change of procedure on contamination cloud photography I'd be pleased at this point.

SC Okay, give us a couple of minutes to reconfigure here. We'll have time to do that.

CAPCOM Okay, fine, I'll stand by for your word.

SC Okay Houston go with the contamination cloud photography update.

APOLLO 15 MISSION COMMENTARY, 8/6/71 GET26908 CDT1343 707/2

CAPCOM Roger, Dave. Are we on photo 25?

SC Photo 25 go.

CAPCOM Okay the reason for this change is that we have to use the DAC instead of the Nikon since we've run out of Nikon film. The first change is under procedure one configure camera, we go down to the second line in the CM-4 et cetera we X that out and we substitute CM4.

SC Stand by 1, Karl. We want to find out if we have any more Nikon film. We may have some.

CAPCOM Okay.

END OF TAPE

SC We want to find out if we have any more Nikon film we may have some.

CAPCOM Okay.

CAPCOM 15, Houston. Our records show that you will be out of Nikon film when you finish the lunar eclipse photography and we prefer that you use it for the lunar eclipse.

SC Does that include mag W.

CAPCOM Stand by.

SC Oh, disregard that, we just found a little note on mag W. It says DO NOT LOAD IN CAMERA. I guess that takes care of that. Go ahead with your update.

CAPCOM Okay. Fine. The basic specs there in, are we're using window 4/DAC/18/VHBW-bracket comma MIR for mirror, PCM PIT cable(T1 1 over 1 thousand infinity 24 feet per second).

SC Okay, DAC/18/VHBW-bracket mirror PCM cable T1 1 over a thousand infinity and 24 frames per second, go.

CAPCOM Correct. The next line is magazine H, magazine Hotel and magazine, and instead of frame number it's magazine per cent to be filled in there.

SC Rog, Hotel and per cent, go.

CAPCOM Okay, completely delete number 2 and substitute instead the following. Utility power on, cover lens, DAC on 2 seconds. Change shutter to 1/60 change frame rate to time.

SC Okay, utility power on, cover lens, DAC on 2 seconds change shutter to 1/60th, frame rate to time in place of the number 2 you have. Go ahead.

CAPCOM Roger. In step 3 we delete inhibit all jetts and at the end we add CMC mode free.

SC Roger, delete inhibit all jetts and add CMC mode free at the end, go ahead.

CAPCOM Roger, at the, at the end of step 4, before, repeat 4 frames sequence. We write CMC mode AUTO, and we delete, repeat 4 frames -

SC Okay, say again.

CAPCOM We delete the repeat 4 frame sequence.

SC Okay, step 4 add CMC AUTO and delete repeat 4 frame sequence. Go ahead.

CAPCOM Roger. Step 5. Instead of T plus 6 plus 630 we, it's T plus 330, 3 plus 30. Dump waste water -

SC Roger T plus 330 by T plus 630.

CAPCOM Roger and it says waste water or urine. It's really waste water and urine. The, and -

SC We have (garble) or.

CAPCOM Go ahead and okay we dump to 40 per cent as you've been previously advised. Also apart of 5, add, repeat step 4 (damp rates).

SC Okay, in step 5 add repeat step 4 and (damp rates).

CAPCOM Step 6 the time there is not 26 plus 30 but it's 28 plus 30. Also -

SC Roger 28 plus 30 by 26 plus 30.

CAPCOM Roger, at the bottom we delete repeat 4 frames sequence and we add the following. T plus 32 plus 0 CMC mode AUTO, and below that repeat step 4 (damp rates).

SC Okay at the end of step 6 cancel, repeat 4 frame sequence and add T plus 32 plus 0 CMC AUTO and then repeat step 4 in (damp rates).

CAPCOM Roger on step 7 it's T plus 43 instead of 48. And at the end delete repeat 4 frames sequence and add CMC mode AUTO.

SC Okay step 7 is T plus 43 and delete the repeat 4 frame and add CMC AUTO. Go.

CAPCOM Roger. Step 8. We delete inable all jetts and what we record is the magazine per cent and that's the end of the correction.

SC Okay step 8 delete inable all jetts and add per cents instead of frames.

CAPCOM Roger, that's got it.

SC Alrighty we'll do all those.

CAPCOM 15, this is Houston. Sorry to tell you but I made a couple of errors in that read up. Can we make it two corrections.

SC Okay stand by.

SC Okay, Karl, where are the corrections.

CAPCOM It's photo 25.

SC Okay, I'm on photo 25.

CAPCOM Right. At the end of steps 5 and step 6 I put in a little statement saying repeat step 4 damp rates, that's really meant to say repeat step 3, which is damp rates, in both cases.

SC Okay, understand.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/6/71 GET 269:42 CDT 14:17 70.9/1

CAPCOM 15, Houston.
SC Go ahead, Karl.
CAPCOM Guys, at the end of photo 26, when you get
through with this sequence, we're requesting 2 seconds of
protect frame, also.
SC Okay.
SC Okay, got you.
CAPCOM Apollo 15, Houston. The Lunar Eclipse
photo pad on your flight plan, page 384, when you're ready.
SC Stand by.
SC Okay, I'm ready to copy the photo pad on
the Lunar Eclipse.
CAPCOM Okay. 270 49 53.
SC Roger. 270 49 53.
CAPCOM Roger.
PAO This is Apollo Control at 269 hours 51 min-
utes. Those last couple of transmissions have been by the
backup crew Commander, Dick Gordon, who has joined CapCom
Karl Henize at the console. Apollo 15 now 111 271 nautical
miles from earth, velocity 4746 feet per second.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/6/71 GET269 54 CDT1429 710/1

CAPCOM 15 we'd like to have OMNI Charlie.

SC OMNI Charlie.

CAPCOM 15, Houston. We'd like to get the high gain up. Pitch 22, Yaw 261.

SC Stand by one. We're maneuvering. Okay, Houston, your high gain angles for the sextant photos or for the lunar ellipse photo attitudes.

CAPCOM Sorry about that, Dave. When you complete this maneuver there in your flight plan, pitch minus 22, yaw 227.

SC Rog.

CAPCOM 15 we'd like to have OMNI Bravo.

SC OMNI Bravo.

CAPCOM 15, Houston. Give us AUTO in narrow in the high gain, please.

SC Roger. AUTO on now.

PAO This is Apollo Control at 270 hours, 17 minutes. We should be getting television in a few minutes now. Apollo 15's distance from earth 110,080 miles, velocity 4,790 feet per second.

SC Houston, 15. You ready down there?

CAPCOM Roger, 15. We're close to ready. Are you ready for the big press conference?

SC Rog. We're ready. Anytime you want to go to transmit let us know.

CAPCOM Okay, you can go ahead to transmit. Okay 15, we're getting a beautiful picture coming through.

END OF TAPE

CAPCOM Hey 15, we're getting a beautiful picture coming through.

SC Roger, can we have your questions?

CAPCOM Roger, we'll admire the beautiful picture for a few minutes here.

CAPCOM Deke just passed out from the shock, incidentally.

CAPCOM Okay fella's I have a preliminary statement to make here. The questions you will be asked in this news conference have been submitted by newsmen here at the Manned Spacecraft Center 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. The questions are being read exactly as submitted by the newsmen and in an order of priority specified by them. Question number 1. Just last week we have shared scores of exciting moments with you. Which single moment would you most like to live again, and is there any moment which you would never like to repeat?

SCOTT Well I guess we probably have different ideas of which would be the single most exciting moment of the flight, and maybe we'll just run through it one at a time. I guess the most impressive moment I can remember is standing up on Hadley mountain, Hadley Delta, and looking back at the plain, and seeing the LM and the Rille and Mount Hadley, and the whole big picture in one, one swoop. And I think we've got some pictures for you from up there, and I believe the TV was running at the same time, and I think that was probably the most impressive sight that I've ever seen. Al -

WORDEN I guess I'd have to say, sort of, two events occurred, which were exciting, for different reasons, and I guess they were really kind of the highlights of, of the flight for me. One was, right after LOI, when we got our first look at the moon, and it was a fantastic spectacular sight, and the other, I guess was, when TEI burned so beautifully, and right after TEI, that was an awfully good feeling.

IRWIN Okay, well I guess there were a great many new thrills for me, and the one that was most impressive though, was the lift off, it began the flight, and I knew that I was going into space, after a few years of waiting and training. And then as far as the event that I would not like to repeat again, was probably the time when I fell down in front of the TV, when we were deploying the rover.

CAPCOM Question number 2, near Spur crater, you found what may be Genesis rock, the oldest yet collected on the moon. Tell us more about it.

SCOTT Well, I think the one you're referring to was, what we felt was almost entirely plagioclase or perhaps Anorthosite, and it was a small fragment setting on top of

SCOTT a, a dark brown larger fragment, almost like on a pedestal, and Jim and I were both quite impressed with the fact that it was there, apparently waiting for us, and we had hoped to find more of it, and I'm sure, had we more time at that site, we would have been able to find more, but I think, that this one rock, if it is in fact the beginning of the moon, will tell us an awful lot, and we'll leave it up to the experts to analyze it when we get back, to determine its origin.

CAPCOM Question number 3. Apollo 15 is already being described as one of the great events in the history of science. Aside from the crystalline rock, what other findings at Hadley Apennine seem most important to you?

IRWIN I guess, immediately, I think of the orientation, or organization that was revealed in the side of Mount Hadley. There's 14,000 feet, vertical relief of vast mountain face exposed to us. There was layering in there that was most impressive for the total 14,000 feet, and we commented on the number of beds we could see. That really impressed me, that you could have that much organization on a large mountain, on the moon.

CAPCOM Question number 4. This is the toughest landing area we have attempted to reach on the moon. Describe what it was like, flying into it.

SCOTT Well I think, to begin with, we had every confidence that we could get to the landing site. The trajectory had been modified, so that we had adequate clearance over the mountains, and, the first sight I had, out the window, was somewhere around probably 9 or 10,000 feet, as we passed down below the upper elevations of Mount Hadley, and I could see Mount Hadley to my left before we pitched over, and saw the plain of Hadley, and that was probably as impressive a sight as I've seen. The landing itself, once we -

END OF TAPE

SCOTT Hadley. And that was probably as impressive sight as I've seen. The landing itself, once we pitched over was somewhat of a surprise in that the cratering was much more subtle than we had expected. There was a great lack of any large fragments of boulders on the surface. It was apparently quite smooth, and those rather deep craters, which we had anticipated using as landmarks - because of their subtlety - did not appear quite as readily as we had hoped. I think we did recognize our relative position - east west of the rille, because of the size of the rille itself. I think we were a little off on the north-south, but close enough to handle the traverses of the Rover. I think that having a vehicle such as that enables us to go into more complicated difficult landing areas, because it's not necessary to land on an exact point, we can take advantage of mobility and land anywhere within a certain prescribed area which was initially our goal on this flight.

CAPCOM Question number 5 for Al Worden. In lunar orbit you too carried out geologic observations. For example you reported cinder cones, could you discuss this and other observations from 60 miles up?

WORDEN Yes, the comment on cinder cones was one of color, but we noticed particularly on some of the lighter part of the backside that many, many of the craters that we flew over were filled with what appeared to be lava. There seemed to be a great number of lava flows in the Mare area, particularly Mare Imbrium, Mare Imbrium seems to be just a countless numbers of lava flows which were all apparently very thin and very fluid and you can see . . . you can just count numbers of full front covering Mare Imbrium, so we got I think, quite a distinct impression of a great deal of volcanism around the moon and in some particular isolated area such as the Littrow area and such as areas like probably the Aristarchus plateau, there's a great deal of volcanism and some cinder cones and certainly a lot of lava flows.

CAPCOM Question number 6, do you feel that the work load during your three lunar surface excursions was too demanding? You appeared at times to be reaching the limit of your endurance. Any recommendations for Apollo 16?

SCOTT I think any time you set out on a task such as the one we had, you're bound to at certain times, get a little tired, which I think we probably did, however, I think we came back and I don't think we ever reached anywhere near the limit of our physical endurance, I think Apollo 16 probably has everything in hand, it's just a matter of conditioning yourself. Jim and I discussed it since we got back on board the Endeavour and concluded that our training is what really prepared us, and the many hours we spent during

SCOTT geology field trips and its relations at the Cape in our suits. We feel it was the factor which really contributed to being able to proceed with those duration EVA's. I see no problem in the future with conducting three successive 7 hour EVA's. Neither one of us was particularly physically tired, I think fatigue is really in the mental regime in which you're concentrating very intensely for 7 hours and you're pressing to do your best all the way through and keep your eyes open to make the appropriate observations and gather the samples, and I think its really more of a mental factor than a physical factor.

CAPCOM Question number 7, you described the lunar Rover as a bucking bronco, would you elaborate and assess the Rover's performance and tell us what changes you recommend for the 1972 model.

WORDEN Well, there were several times there when we were riding along where we would hit on a sizable bump and you could see the wheels come off the ground and then float through the air and . . . but Dave should comment more as far as the driving and it was really like a bucking bronco, that's true, because I was strapped in, as you know Dave had to strap me in because I had some trouble with my seat belt, but I really did feel like I was on a bucking bronco.

SCOTT I think I might add that it's a very stable machine, but because of the

END OF TAPE

SC I think that I might add it's a very stable machine but because of the 1/6 gravity it tends to float. In the simulations that we ran in Houston we saw the same amplitude or same degree of bouncing but a different damping. In other words, the vehicle would come off the ground, one wheel normally would come off of that and it would take it somewhat longer to return to the ground than in 1G and I think it's just a matter of becoming accustomed to the driving. It's a very stable vehicle. The suspension system is excellent. We had to make some rather sharp avoidance turns periodically and in these turns we could tell the vehicle was quite stable no tendency to turn over whatsoever. I think the only recommendation we'd really have would be to come up with a new idea on the seat belt type arrangement and we've discussed that also. I think we have some suggestions we could make when we get back to insure that you can have both crewmen securely in their seats in a short period of time. Other than that I think the vehicle is about as optimum as you can build.

CAPCOM Question number 8 for Dave Scott. The drill seemed to drive you up the crater walls. What was the problem and was it worth the time.

SC I guess I had anticipated that question. I think the problem was a striking discovery. When we went to Hadley Rille we expected to find a regolith or the soil about 5 meters thick. And with that in mind, like 25 feet, I expected to have no trouble putting the heat flow probes in or drilling the core stem, because of the expected soft soil. After about 1 meter I ran into hard rock and my first thought was it was an isolated rock somewhere within the soil. But that was not the case, apparently what we have is a very thin regolith, or a thin soil layer above solid rock. And with this in mind I think we brought back a core stem or a deep drill core to moon of basic bedrock or foundation rock on Hadley plain. I think that's a very significant find. I think it will be very meaningful to the scientist when they analyze it. The perplexing problem during the actual drilling and extracting the core stem. If you put a drill into solid rock, it's very difficult to get it out. And there, again it took both Jim and I with our shoulders pushing as hard as we could up to extract the drill stem. And the final analysis as I look back on it I think it is indeed worth while, at the time it occurred we were both interested in moving out to the northern complex and further geology, which Jim and I are quite interested in. And the mechanical task of doing the drill at that time seemed somewhat less important than seeking new finds in a new geological area. But in retrospect I think we have in fact brought back one of the most significant samples of the whole trip.

APOLLO 15 MISSION COMMENTARY 8/6/71 GET 27034 CDT 1508 713/2

CAPCOM Question number 9 for Dave Scott. In view of your comment to geologist Leon Silver about the need for trained scientist on the moon, do you think that Scientist-Astronaut Jack Schmitt should be included in the crew of Apollo 17, the last of the Apollos.

SC Well since I really have very little say so as to which people get selected for which crews. I might sort of bypass it with a one comment that the more qualified the man is on the moon the more results you are going to get. And I think that's one of the reason that we put in as much time as we did into the geological aspects, in hopes of learning enough to bring back some significant data. I think that any situation such as this, in any scientific endeavour, you want the most qualified people possible. You must also remember that this is a highly complex operational mission it requires a great deal of training and skill in order to fly these machines. I think, in particular, Jack Schmitt is a very highly qualified individual in both aspects. And I believe it's up to the management, that when they select a crews to select the best people for the flight - -

END OF TAPE

SC - in particular Jack Schmitt, is a very highly qualified individual in both aspects. And I believe it's up to the management when they select the crews to select the best people for the flight.

CAPCOM Question number 10 for Al Worden: What runs through the mind of a man orbiting the moon alone?

SC Well, I guess the thing foremost in my mind during those 3 days was how I was going to keep up with the time line and the flight plan. And how I was going to keep track of all the experiments we had going and where they were and whether they were operating or not. And I guess that was a very, very fast 3 days for me; when I wasn't looking at the SIM bay experiments I was looking out a window and taking pictures and it was a pretty crammed 3 days. As a matter of fact, I guess I didn't really have much time to give any thoughts to being alone up there.

CAPCOM Question number 11 again for Al. You said after your spacewalk you wish you'd stayed out longer. What was it like out there between the earth and the moon and why did you come in so soon?

SC Well, let me answer the last one first. I guess I didn't come in soon - I came in when the job was done. And as a matter of fact, I made an extra trip back out to take a look at the mapping camera. And as far as what I felt like when I went out there, we talked a little bit about it after the EVA and decided it was sort of like walking on stage with your high school dinner dance or something. We opened the hatch and it was pitch black and as soon as we got out, the sun was beaming down on everything and it looked like a very large floodlight on a stage. And then putting the TV camera out on the door, it just added a little bit more to that sort of unreal feeling that it was time to get out on the stage and do something. I think, as far as the EVA went, we did it just almost exactly as we'd practiced it. It took almost exactly the same amount of time and did it the same way. And of course we had practiced that with the mapping camera in the extended position and so that really posed no difficulty to us.

CAPCOM Question number 12 for Dave and Jim. You didn't have time to get to North Complex, craters which may have been formed volcanically, and where you thought some surprises might be found - was this a significant loss?

SC Well, I'll start out and throw an answer there. I think if you look back at the original requirements for the landing at the Hadley Apennines, they were primarily to inspect the front and the rille. It was only after a considerable amount of study had been done and some rearrangement in the flight plan, the timing on the surface, that we found we had enough time to plan to go to the northern complex.

SC So the northern complex was in fact an addition to the original requirements; it was a bonus. And I think because Jim and I have spent so much time with volcanics in our terrestrial geology work that we were quite interested in getting to the northern complex to see if, in fact, it was a volcanic area. But I don't believe we lost anything from the lunar surface by not going there; only, we would have had an extra bonus had we been able to reach that point. And with that in mind, I hope that some day somebody gets a chance to go back and take a look at the northern complex. Jim, do you want to answer?

SC No, I agree with everything you said. It was just a little personal disappointment we couldn't get up there because we thought we'd have another beautiful view of the plains there and the LM, a view almost as beautiful as it was from the side of Hadley Delta.

CAPCOM Question number 13 for each of you. Would you please, in your own words, tell us what you gave the American taxpayers besides a few hours of good television?

SC Oh, I think the magnitude of the scientific data we return will speak for the taxpayers money. The small amount of time they had for television, I think, is rather insignificant relative to the amount of return we gathered in the SIM bay and in the lunar samples we have aboard right now. I think these data will not only enhance the progress of science but it will reach the common man on the streets directly by the by-products of what we learn.

END OF TAPE

SC The by products of what we learn. I think man must expend himself, the new frontiers must be open in order for us to propagate mankind, and I think this is one way in which we can do it. I feel that the taxpayers got, probably as a matter of fact I hope they got more than their money's worth out of the flight and if you could see the size of the film magazines that Al brought in yesterday from those cameras why, you'd see that we have indeed at least a great deal of data on film alone.

SC Well, I really guess that there's not much to add to what Dave said. He expressed my sentiments exactly and that the knowledge that hopefully we've added to our store of information about the moon and about ourselves, will be increased in an extent which is greater than the capitol that was spent on the flight itself. And that I would certainly think that the full theory adds significantly to man's knowledge about himself primarily and about himself in those areas where it will help future generations maybe.

SC I can only add that we're bringing back just a lot of data and a lot of material. It'll take many years for people to really appreciate how much was gained from this flight.

CAPCOM Question number 14. It seemed this flight had as many problems as some of the old Gemini missions, which of these gave you the most concern and for Dave, did you ever feel you were back on Gemini 8?

SC Well, I guess we weren't aware we had that many problems. I thought this was a rather trouble free flight myself. We went a long way, we spent a long time doing the job and I think relative to the number of systems we have in all the spacecraft that we had very few problems. I can think of none that were significant that would enable me to compare them to Gemini 8 at all. We had a - I guess the first little problem was a leak in our water system, which has cleared up rather rapidly by somebody having already done some investigation, and having a procedure at hand. I believe our system is such that people have all the anticipated problems understood and when they have them understood they come up with solutions which are quite meaningful and successful. And I feel like the spacecraft and the life support systems on the moon and everything worked exceedingly well. I guess really I couldn't ask for much more. How about you?

SC You know really we had very few problems. It seemed like a very tame simulation as far as I was concerned. Certainly there were irritating things that happened like some circuit breakers in the spacecraft here that gave us some trouble. And some lights that aren't working exactly right.

APOLLO 15 MISSION COMMENTARY 8/6/71 GET 270:44 CDT 15:18 715/2

SC But certainly none of the important aspects
of the flight or none of the essential pieces of equipment
have malfunctioned and I think it's been just great.

CAPCOM Gentlemen, we'd like to continue the press
conference in a few minutes. In the meantime we'd be anxious
to get - -

END OF TAPE

CAPCOM But in the meantime, we'd be anxious to get start - get one of you started on the lunar equipped photos. We have three more questions. Question - -

SC Okay - -

CAPCOM Question number 15. For Dave and Jim, how many times did each of you fall down on the lunar surface. Did any of these falls hurt you or give you any problems?

IRWIN I fell down twice and it was never any real problem. Actually I could have got up very well by myself without any help.

SCOTT Yeah, I guess I fell down twice too, and as Jim said it was never any real problem. It's a matter of if you start to go and of course, the terrain there I guess you could see the television was quite rough and irregular, with occasionally rocks around and we were pressing to try and get things done. And it was just a matter if you just start losing your balance to go ahead and go easy. And accept somewhat of a light fall, because of the one sixth gravity there was never any impact when we hit. Take it easy and get up slow. And I don't think either one of us ever came anywhere near the point of being hurt in that sense of the matter it's just a matter of pulling you up for a minute, enabling you to regain your balance and go ahead. And I have a question. Do you want to have the photo of the lunar eclipse with the television now or do you want us to get on with the camera photos. Because if that's the case we have to turn the lights out.

CAPCOM Rog. We're going to skip down to the last question Dave, which says your cabin must be jammed with moon rocks, core samples, suits and assorted hardware, can you show us what it's like in there and as you show us around you can get set up for the moon photos and dim the lights when you like.

SCOTT Okay, I guess to show you around we have to unstow everything. We're pretty well stowed for reentry right now. We have all the samples stowed, the suits are all stowed and I guess in order to show you around we'd have to do some unstowing because under - beneath the couches right now, it's jammed full. And I guess we'd like to do that for you, but it's somewhat impractical, in that all you're going to see would be some white bags and that's why we have the room in the cabin here because everything's pretty well squared away. But when we get back I'm sure you'll have an opportunity to see the many things we have and there's really a lot of it.

CAPCOM Okay, Dave. That's fine. And I guess one last request is when you get over to that window and before you take the photos could you give us a quick picture of the

APOLLO 15 MISSION COMMENTARY 8/6/71 GET 270:48 CDT 15:22 716/2

CAPCOM moon with the TV camera?
SC Sure will.
CAPCOM 15, the word here is to proceed - give your
photography first priority there and maybe we can see the
moon out of the other window.
SC Okay, we're working on it.
CAPCOM 15, Houston. We hear that your attitude is
very good right now, there's no need to trim the maneuver.
SC Okay, thank you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/6/71 GET 270:53 CDT 15:27 MC717/1

SCOTT Okay, thank you.
SC Okay, Houston, thank you, I have a
picture of her now. There she is.
CAPCOM 15, so far we have a blank screen down
here.
SC Oh really, I'm getting a good picture on
the monitor.
CAPCOM Hang on for a moment, please.
CAPCOM It's coming through now. That's a
beautiful picture with just an edge of the moon coming out
of the eclipse.
SC Rog, that's right.
CAPCOM 15, Houston, we'd like to ask if you got
full zoom there?
SC Roger, it's all the way out.
CAPCOM Could you please give us AL feet of peak.
SC All right, I think we are stand by a minute.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/6/71 CST15:32 GET270:58 718/1

CAPCOM Hello Endeavour, this is Yankee Clipper,
over.
SC Hello Yankee Clipper, How are you?
CAPCOM Roger, I've got a naval tradition to
pass on to you.
SC Go ahead.
CAPCOM Roger, when ships of the line have
completed a mission such as yours, and they return to home
port they always have a broom flying from the yard arm, over.
SC Rog, well, we'll do that.
CAPCOM Thank you.
SC We wouldn't want to break any
traditions, Dickie.
CAPCOM Dave, I'm watching you. I wouldn't
let you.
SC Atta boy, and I'm glad. Okay Houston,
we're going to switch windows here with the TV cameras, so
we can switch windows with the camera cameras.
CAPCOM Roger, Dave.
CAPCOM 15, Houston. When somebody gets a
free hand up there, could we start the charge on battery A?
We're afraid that might keep us from going to bed if we don't
get it started soon.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/6/71 GET 27103 CDT 1537 719/1

SC Houston, the moon is an orange ball, now. Dull orange ball with a sort of gray area in the center and on one side opposing the side that's slowly coming into illumination at the present time, and you'll possibly get more and more of the lunar surface exposed to sunlight as we go along here. The picture you have is really pretty good for what we see because there's very little illumination of the moon. And only when we get the cockpit lights down reasonably low and get our face up to the window can we see the definition. So it's really not a bad picture.

CAPCOM Roger, 15. Thanks for the description and the picture we're getting down here is quite good also.

SC Okay, I'm sure you'll have a much better one here in a few minutes.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/6/71 GET 271:08 CDT 15:42 MC720/1

CAPCOM Apollo 15, Houston. Over.

SC Houston, 15. Go.

CAPCOM Roger, it looks like you've had enough of the photography right now, it's beginning to get pretty bright on the tube. I guess we can go ahead and power it down.

SC Okay.

SC That's interesting Houston, because it looks like only about, oh, maybe 1/20th or so maybe, of the moon is illuminated at this time, just a thin sliver, but very bright.

PAO Capcom is Bob Parker, now. And as the camera was powered down, Apollo 15 was 107,495 nautical miles from earth, velocity 4,888 feet per second.

END OF TAPE

SC Roger.

CAPCOM Apollo 15, Houston. We request S-band
ox to science, please.

PAO This is Apollo Control at 271 hours,
20 minutes. Shift change is underway in the Control Center.
We estimate the change of shift news briefing for 4:15 PM
Central Daylight Time.

PAO This is Apollo Control. At this time
we are going to replay the video only of the inflight press
conference. This will be seen in the MSC news center.

SC Houston, Apollo 15.

CAPCOM Roger, Apollo 15, go ahead.

SC In getting ready for contamination
photography, we find that we've got a certain number of exposures
left in the Nikon, namely, we're on exposure number 29,
mag victor and we think we have 45 total, which would enable
us to complete the contamination photography with the Nikon,
if you desire, rather than with the DAC, as you change.

CAPCOM 15, they plan on using those last 15
frames or so on victor for post mission calibration, so we
still intend to press on with the DAC, please Dave.

SC Alright, understand, thank you.

CAPCOM And Dave, if you'll give us start time
on that, I'll give you a call at the end because we want you
to cycle some extra film through the DAC, give them a little
leader there at the end to protect their film or something.

SC Okay, we'll do that, stand by.

PAO This is Apollo Control. At the present
time, we are replaying the video only, from the Apollo 15, in
flight press conference. The change of shift press briefing,
is scheduled to start shortly in the MSC news center briefing
room. During this press conference, we will as is our practice,
record any conversations with the crew for play back following
the change of shift press briefing.

END OF TAPE

PAO This is Apollo control at 271 hours 51 minutes. We accumulated less than a half a minute of tape during change of shift briefing. We'll play the tape conservations with the crew at this time and then leave the lines up live.

CAPCOM Apollo 15, Houston. Over.

SC Go ahead, Bob.

CAPCOM Rog. We were seeing the optics just around against the hard stop. We'd like to have you bring them back and then zero them in your usual procedure. We kind of guess your getting ready for 52 anyway, aren't you.

SC Pretty soon.

CAPCOM And, 15 we have your torqueing angles. You go to torque.

SC Roger in 30 seconds.

CAPCOM Apollo 15, Houston. If one of you guys is free, we've got some updates we could read to you.

SC Okay Houston, 15. Stand by one.

CAPCOM Okay, understand you're ready. The first thing is an entry pad. So you might whip out your entry checklist.

SC Okay Houston, 15. Go ahead with entry pad.

CAPCOM Roger, would you believe it, we're going to land in mid Pacific. And after that it's 000 153 000 294 4137 267 plus 26 12 minus 158 10 062 360 97 650 108 48 361 79 294 58 37 0029 NOUN 69's are na. 400 0213 0018 0338 0744 04 1403 375 213 down 096 right 47 lift vector up, comments 1 use nonexit EMF pattern, 2 RET is 90K 6 plus 06, RET of mains 8 plus 32. Landing 13 plus 29 constant g roll right moon set time 294 5620. Over.

SC Okay Houston, Understand. Entry pad mid Pac 000 153 000 294 4137 267 plus 2612 minus 158 10 062 360 97 650 10848 36179 294 58 37 0029 400 0213 0018 0338 0744 04 1403 375 213 down 096 right 47 lift vector up, comments non-exit use nonexit EMF pattern, RET 90K is 6 plus 06 RET mains 8 plus 32. RET landing is 13 plus 29 constant g is roll right moon set at 294 5620.

CAPCOM Roger, Al. Good read back. And we'd be interested in knowing the status in the EMS check you ran 2 or 3 hours ago, if you have it.

SC Yes sir. EMS check was just fine.

CAPCOM Okay, that's good to know. At the end of your contamination - -

END OF TAPE

SC Yes sir, the MS check was just fine.
CAPCOM Okay, that's good to know. At the end of your contamination experiment here, we'll be going into this mass spect boom test and if you guy will let me know when you're ready, we've got a procedure to read up to you for that - we'll read up to you at that time. I assume you've been told that we're not going to a mid-course 6 and right now mid-course 7 is looking like .09 which makes it kind of problematical as to whether we burn it or not. Weather in the recovery area is currently predicted to be for your splashdown 15 knot winds, 4 foot seas, 2000 scattered 10 miles, in other words, looking better and better all the time.

SC Roger, Bob, that sounds great.
CAPCOM Apollo 15, Houston, if you'll give us ACCEPT, we'll give you a very slight clock update to synch you for entry. Be advised we will not be sending a state vector uplink at this time; your vector is still just as good as the one on the ground.

SC Rog, understand, you've got accept.
CAPCOM 15, your computer.
SC Rog, thank you.
CAPCOM 15, Houston, request you trim back to original attitude now.

SC Okay.
CAPCOM And again, if one of you has a couple of minutes, we can tell you a couple of other things.

SC Okay, in other words, you want us to maneuver back to the original attitude rather than just damp rates.

CAPCOM Rog, we'd like to use the same star backgrounds; that means going back to the original attitude of the flight plan around 271:20 or so.

SC Okay.
CAPCOM Which is what you got called up.
SC No, we don't have that called up. All we have is damp rates.

SC We'll do that. Oh, what we have called up here yea, okay.

CAPCOM 15, Houston, if one of you has some time, we'd like to talk about some stowage place.

SC Okay, go ahead.
CAPCOM Okay, we've gone over the stowage which you read down this morning and everything is shipshape except we have one question on one item and that concerns the stowage of the core stems. The core stems should be stowed in the sleep restraint that has the CMP's PGA in it. We understand that it's now stowed in the bag on the side of A 8. I guess our first question is how many - how long is the core stem

CAPCOM at the present time? Did you break it down or is it still 3 sections long which we think it is on the ground.

SC No, it's still 3 sections long and we could put it in the sleep restraint, it just seemed like a convenient place to stick it in the bag over there to keep it tied down well.

CAPCOM Okay, next question is, how'd you get it in the A 8 bag which according to our measurements from the ground is only 36 inches long and therefore apparently not long enough to hold the 3 lengths of core stem?

SC Well, it's sticking out a little bit i guess we have to admit but it's pretty well cinched down.

CAPCOM Okay, stand by.

SC But it's not too bad, we'll put it anyplace you like.

CAPCOM Okay, Dave, guess we - I don't think it makes an awful lot of difference but it'd probably make a lot of other people happy if you ended up putting it in the sleep restraint. And they wouldn't worry about that loose end hanging out there, if it's not too much trouble.

SC Oh, it's no problem at all; be glad to do that.

CAPCOM Thank you.

SC You know we know what priority on this spacecraft is. We wouldn't lose that or misplace it or get it rattled around for anything, Bob.

CAPCOM No comment.

SC And you say everything else is okay.

CAPCOM Rog, everything else is A okay.

SC Oh boy.

END OF TAPE

CAPCOM And 15, remain or question, did you guys get the word that they like a pad of about 2 seconds worth of 24 frames per second at the end of these photos to protect these things.

SC Rog, we got that, Bob, thank you.

CAPCOM And if you guys will give me a call when you are ready to do the mass spec boom test, I'll read it up to you.

SC All righty, stand by.

SC Houston, 15.

CAPCOM Go ahead 15.

SC Okay, you going to read up the procedures real time on the mass spec boom?

CAPCOM Roger.

SC Okay, why don't we go ahead and do that, then while we are finishing up on the pan (garble)

CAPCOM Okay, stand by. Okay, 15, first step is mass spec boom to retract, brought back barber pole for 4 minutes or until gray. If brought back fully gray within 4 minutes, deploy boom and return to Flight Plan. Over.

SC Roger, understand, you want retract on the mass spec boom for 4 minutes and if it goes gray before then, go back to deploy and return to the Flight Plan.

CAPCOM That's affirm. And give us a call when you get done.

SC Roger.

SC Houston, 15.

CAPCOM Go ahead 15.

SC Okay, there's 4 minutes of retract and it's to barber pole.

CAPCOM Okay, if the brought back is not fully gray in 4 minutes, lets go to mass spec boom off, center, for one minute. That's just to let the motor cool down.

SC Okay, it's off now.

CAPCOM Okay.

SC (garble) at the end of the work minute.

CAPCOM Okay, at the end of the one minute, we will deploy it for 20 seconds and then off center, and then we will retract for 40 seconds or until the talk back is one half barber pole or fully gray and then OFF. Over.

SC Okay, good.

SC Okay, going on (garble)

CAPCOM Okay.

SC And do you want to pause it off between extend and return?

CAPCOM Stand by. Not necessary to pause between deploy and retract on this.

SC Okay, it's in retract now.

CAPCOM Copy.

SC Okay, Houston, there's the 40 second retract and it's at half barber pole, and I turned it off.

CAPCOM Okay, in that case, we'd like you to repeat the 22nd deploy, 42nd retract sequence twice more and if gray talkback is still not obtained, we'll turn it off and wait until 275 hours at which point we'll give you a call and we'll repeat that. Over.

SC Okay, fine, we'll cycle that whole thing twice more.

CAPCOM Roger.

CAPCOM 15, Houston, we'd like to proceed with the fuel cell purges now to get those out of the way before the P23.

SC Roger, Houston.

SC Houston, Mass spec boom has been cycled three times, all I can get out of it is a half barber pole and I've got it turned off right now.

CAPCOM Roger, copy. Al, we'll call you at 275 hours to repeat that, the reason for that is that presently we are sort of sitting in a cold soak attitude, we are going to repeat it at 275 hours when we are sort of in a hot soak attitude.

SC Okay.

CAPCOM Apollo 15, Houston. We'd like to go to Ion source off and mass spec experiment to standby.

SC Ion source off, and mass spec to standby.

CAPCOM Roger.

END OF TAPE

PAO This is Apollo Control. The crew has completed the program 23 midcourse navigation exercise, aboard the spacecraft, and should be beginning their eat period, or already into it at this time. Before we put them to bed, they'll have 1 more set of navigation sightings to take, on a series of stars. And we'll put the spacecraft in a passive thermal control mode. The rest period is scheduled to begin at 277 hours 30 minutes, or about 4 hours from now. Apollo 15 at the present time is, 101,214 nautical miles from the earth, and traveling at a speed of almost 1 mile per second. We're reading 5,137 feet per second.

CAPCOM 15, Houston, 15, Houston, Al, we missed your last noun 49.

SC Okay, I'll show you this one.

CAPCOM Thanks. 15, Houston, looks like a good set of P23's again, Al. And your gamma, right now, on your vector, is 6.5.

SC Sounds like, after a while we might get along without you, huh, Bob.

CAPCOM No comment.

SC As a matter of fact, if you guys keep working on your ground vectors, they might even converge to the on board vectors pretty soon..

CAPCOM Apollo 15, Houston, over.

SC Go ahead Houston, 15.

CAPCOM Roger, 274 05, we'd like to delete the mass spec line, where you turned on multiplier low, etc. We'll delete that.

SC Okay, we'll delete that line - line, Bob.

Thank you.

CAPCOM Thank you.

SC And Houston, 15.

CAPCOM Go ahead, 15.

SC Rog, want us to delete the logic power 2, if we're going to do the mass spec at 275?

CAPCOM 15, that's affirm.

SC Okay.

CAPCOM And 15, Houston, you got any more updates to our flight plan?

SC No, but I'll scan it over, and if I find any I'll let you know.

CAPCOM Apollo 15, Houston, over.

SC Houston, 15, go.

CAPCOM Rog, we have an update to the flight plan, if you guys are ready to copy.

APOLLO 15 MISSION COMMENTARY 8/6/71 CST1913 GET273:10 725/2

SC Roger, we're ready to copy.

CAPCOM Okay, the attitude that we maneuver to at 274:46 there, for the second set of x-rays should be changed, that verb 49 maneuver, should be changed to 196 346 012. Over.

SC Roger, understand the verb 49 maneuver to x-ray pointing attitude, should be changed to 196 346 012.

CAPCOM Roger, and before we start that verb 49 maneuver at 274:45, or there about, we'd like to cover the - we'd like to close the experiment covers, Alpha x-ray to close, that's the one on panel 278, and then after we get to attitude at about 275 00, we'll go ahead and open those covers again, the alpha x-rays.

END OF TAPE

CAPCOM -- the alpha X-ray.

SC Understand, you want the alpha/X-ray covers closed before and open after the maneuver.

CAPCOM Roger, these, the new position I sent you up on that, those two steps there in the procedure are to keep from getting sunlight right in on some of the stuff to protect it.

SC Okay.

CAPCOM And also at this time you may terminate the battery A charge.

SC Okay, terminate the battery A charge.

SC Houston, 15.

CAPCOM Go ahead 15.

SC Roger, Bob, do you want us to go to standby on X-ray while the door is closed or is it okay to leave it on?

CAPCOM Roger, you can leave it on.

SC Okay.

CAPCOM Apollo 15, Houston, request OMNI Charlie, please.

SC OMNI Charlie.

CAPCOM Apollo 15, OMNI Delta, please.

SC Roger OMNI Delta.

PAO This is Apollo Control at 275 hours; Apollo 15 at the present time 96,347 nautical miles from earth and traveling at a speed of 5342 feet per second. A short while ago the recovery room here in the Control Center reported that the prime recovery ship is headed toward the target point in the Pacific Ocean - north of Hawaii. Seas in the predicted landing point are 4 feet; clouds are 2000 broken; and we expect to have 15 knot winds at splash time tomorrow - generally very good weather predicted in the recovery area. The crew is scheduled to begin an eat period at this time. Following that they have one more set of star sightings to take - mid-course navigation. Prior to putting the spacecraft in the passive thermal control mode - after eating rather, they'll put the spacecraft in the passive thermal control mode prior to beginning their 9 hour rest period. And on the clock that's counting down towards splashdown we show 20 hours, 9 minutes, 40 seconds now until splashdown.

CAPCOM Apollo 15, Houston, over.

SC Houston, 15, go ahead.

CAPCOM Roger, remember backaways, we were talking about doing some more mass spect boom tests at 275 hours, which is gone by. Right now, we're talking about delaying that until 276 hours approximately, or at least until before you start your Verb 49 maneuvers for the next set of P23's. Over.

SC Okay, fine.

CAPCOM We're just letting it (garbled) go a little bit longer.

APOLLO 15 MISSION COMMENTARY 8/06/71 27439 GET 1913 CDT MC726/2

SC And Houston, 15, I have some Command Module
RCS injector temperatures for you.

CAPCOM Ready to copy.

SC Okay, these are readings off systems test
meter 5A is, or 5C is 4.2, 5D is 3.9, 6A is 4.1, B is 4.2,
C is greater than 5, and D is 4.5.

CAPCOM Roger, copy 42394142 greater than 45.

SC Roger.

END OF TAPE

CAPCOM Apollo 15, Houston. Over.
SC Go ahead, Bob.
CAPCOM Rog, if one of you fellows has the time we might like to continue on with the mass spect boom retract test.
SC Okay, is it something I should write down or can I just do it real time.
CAPCOM I'll give it to you real time, it's not that complicated Jim.
SC Okay.
CAPCOM Okay, we need the experiment switch to on down there in the alpha - excuse me the mass spec experiment switch to on. And the ion source on. Over.
SC Understand mass spec experiment on, ion source on. Stand by. Okay, Bob there both on.
CAPCOM Okay, and then next we go down to the other panel and we go deploy for 20 seconds on the mass spec boom, and then retract for 40 seconds or until we get a gray indication. Over.
SC Understand you want deploy for 20 seconds and then - on the mass spec boom, and then retract until we gray or 40 seconds.
CAPCOM Roger, which ever occurs first.
SC Okay, Bob it went gray after thirty seconds.
CAPCOM Roger, copy. Stand by.
CAPCOM Okay, 15. Looks like it's a cold soak problem, then Jim, we'll just deploy it all the way out, and leave it there.
SC Okay, you want us to deploy it all the way, now.
CAPCOM Right, after we did all that work and succeeded in retracting it, and now we'll deploy it.
SC Okay, we'll deploy it.
PAO This is Apollo control. Jim Irwin just reported that the mass spectrometer boom on this attempt retracted fully. And it was the indication of gray on the talk back, the indicator in the spacecraft. Previously the indicator had gone half gray half barber pole, indicating that the boom had not extracted fully. At that time we suspected that it's possibly because the spacecraft was in an attitude where the boom was not exposed solar heating and in the attitude at which it was attempted this last time, the service module bay was exposed to heating from the sun. At which would seem to verify the theory that the problems in retracting that boom were due to cooling. At 276 hours Apollo 15 is 93 232 nautical miles from and traveling at a speed of 5 480 feet per second.
CAPCOM Apollo 15, Houston. Over.
SC And Bob.
CAPCOM Roger Al. A recommendation from the ground, here. They'd like to see maybe as many as five optics

APOLLO 15 MISSION COMMENTARY 8/6/71 GET 27545 CDT 2019 727/2

CAPCOM calibration marks the next time instead of the two. It's just to give them some data.

SC Okay, I'll relay that information to our navigator.

CAPCOM Roger, Jim. You sound like Al these days.

SC Oh, we're getting so we sound alike up here.

CAPCOM Apollo 15, Houston. We're standing by ready to copy your NOUN 49.

CAPCOM 15, Houston. We'd like high gain, pitch at minus 30, yaw of 150.

SC Okay, pitch minus is 30 and yaw plus 5 150.

CAPCOM Roger.

SC And you want us to go ahead and try and lock it up.

CAPCOM Please do.

END OF TAPE

CAPCOM Thank you, Al.
CAPCOM Apollo 15, Houston. Over.
CAPCOM Apollo 15, Houston. Over.
SC Go ahead, Houston.
CAPCOM Roger, guidance says thank you, Al. And if, a couple of other things here, if one of you guys has a chance we'd like a mag - magazine status readout tonight and we're seeing some noise on Dave's biosensors, you might want to check them or push them down or something.
SC Okay, I'll do that and you want a magazine status readout, what do you mean by that.
CAPCOM Rog. That means have been taken on some of the magazines there. I think Al's been doing it, he probably knows what's going on and he can tell you.
SC Okay, I guess we don't have a good answer for you on that Bob, and they're all stowed away. And they've all been recorded as we've gone along, is there any particular need for them before tomorrow sometime?
CAPCOM Negative, Dave. That's a good answer it turned out.
SC Okay, I think you'll find them all neatly tucked away and recorded when you get them on the ship. If you're wondering how many pictures we took, last count, night before last it was something like 1847.
CAPCOM Understand, 1847.
SC Or somewhere around the ball park.
CAPCOM Plus or minus one.
SC I think that was LM though maybe yeah, then you have to add that to the Command Module.
CAPCOM You mean like a mile of pan camera film, huh?
SC Something like that. It looks like it ought to hold a mile by the size of the thing.
SC Houston, 15.
CAPCOM Go ahead, 15.
SC Got the log out here and took a look at it and at last count, last night we were 2631 on Hasselblad pictures total.
CAPCOM Copy.
CAPCOM Apollo 15, Houston. Over.
SC Go ahead Houston, 15.
CAPCOM Roger, Dave. The interest in the mags was in reference to the UV, the mags of the UV photography tomorrow. The interest was in the number of frames remaining on magazine Mike, magazine Papa. Trying to determine which of those would be usable for tomorrow's UV photography.
SC Okay, I think we've got that log in the flight plan, standby til Al finishes his P23's so I can take a look.

APOLLO 15 MISSION COMMENTARY 8/6/71 GET 276:25 CDT 21:00 728/2

CAPCOM Roger, understand. No big rush.
SC We'll use a mag that has some film in it.
CAPCOM Say again, Dave.
SC I said, at any rate we'll use a mag that has
some film in it tomorrow.
CAPCOM That's a good idea.
CAPCOM Apollo 15, Houston. Requesting gamma ray
gainstep shield off now please.
SC Roger, shield off now.
CAPCOM That was a good mark, Al.
SC Didn't update the state vector very much.
PAO This is Apollo Control at 277 hours 7 minutes.
Al Worden is presently completing a series of star sightings.
Midcourse navigation exercise using program 23 in the onboard
computer. This will be the last major activity before the
crew begins it's 9 hour rest period. After completing this
they'll go through the presleep checklist, get the systems
set up for the sleep period and put the spacecraft in it's
passive thermal control attitude rotating at about the rate
of 4 revolutions per hour. Apollo 15 at this time is
89,626 nautical miles from the Earth. The spacecraft velocity
is 5646 feet per second. And we're now 18 hours 3 minutes
away from splashdown.

END OF TAPE

CAPCOM Apollo 15, Houston.

SC Go ahead.

CAPCOM Roger, congratulations Al, you've just been proposed to receive a second pass (garble) award for that. We were afraid you were going to do them all the way through the rest period.

SC Well, they're fun enough, I wouldn't mind, so were we.

CAPCOM Okay, and . . .

SC Wouldn't have taken nearly so long if we hadn't wanted 5 marks per each star.

CAPCOM Rog, Al, I'll tell you about that some time. And 15 we're configured for the E Mod dump if you fellows want to give it to us.

SC Okay, it's coming, does the biomed data look any better?

CAPCOM Rog, yes it does.

SC Okay.

CAPCOM And as you get ready in the PTC, we'd like to do the PTC, is .42 there again tonight as last night, there is a change in 979 value there at 277:14.

SC Rog, Bob, I guess we use that as standard procedure now, the 4200.

CAPCOM Rog, you don't have to do it tomorrow night that way though.

SC Okay, Houston, do it this way tonight.

CAPCOM Apollo 15, Be advised that tomorrow when you've taken your P23 marks, 5 marks on the cow and 3 marks on the stars with the P23 itself will be sufficient.

SC Okay, understand, 5 marks on the cow and 3 on each star.

CAPCOM Roger, roger.

SC Hey, Houston, 15 we've got pre-sleep check-list ready too.

CAPCOM Roger, we're standing by.

SC Well, the crew's all ready for bed, no medications, and the onboard readout BAT C is 37, PYRO BAT A 37.1, B 37.1 RCSA 55, B 50, C 48, D 52. And I guess everything is done, you've got your memory dump, and we're ready to power down as soon as we get the PGT done.

CAPCOM Roger, Dave. As far as we're concerned we're all finished also, we will not be uplinking a state vector to you. We might have to do that some time just for practice, but so far we haven't needed to uplink one to you. You guys are doing pretty super on those P23's.

SC Contemplating errors.

CAPCOM I can't believe that was an unanimous vote, Dave.

APOLLO 15 MISSION COMMENTARY 8/6/71 GET 277:08 CDT 21:42 MC729/2

SC No, it was only 2 to 1.

CAPCOM Okay, G&C let me know when he's got his rate tab.

CAPCOM Apollo 15, Houston. You are go to start to set up the PTC.

SC Okay, Buddy, thank you.

CAPCOM Apollo 15, we'd like for you to check that the potable tank inlet valve is open please.

SC Roger, understand, potable tank inlet valve open.

SC Houston, 15.

CAPCOM All right, go ahead, 15.

SC Okay, listen, potable tank inlet valve is open and has been the whole flight. What prompted the question?

CAPCOM Stand by.

SC We're just curious.

CAPCOM 15, We saw a drop in the potable at the same time that the waste tank was staying stable and we were concerned that it might have gotten out of configuration. We certainly expected it to be open, we just wanted to check it before you went to sleep, so we didn't have to wake you up.

SC Okay, understand, yeah . . we're reading potable at 90%.

CAPCOM Roger, we're reading 94.

END OF TAPE

CAPCOM Apollo 15, Houston. No need to acknowledge, but we'd like to put the DSKY to sleep before you guys go to sleep.

PAO This is Apollo Control at 278 hours 2 minutes. Flight Surgeon reports that Dave Scott, the only crewman on whom we have biomedical data tonight, appears to be nearing sleep, at least beginning to drop off, and we expect that he'll be sleeping shortly. During this sleep period we don't expect any further conversation with the crew. The passive thermal control mode appears to be stable. We're watching the attitude excursions, the movements that the spacecraft is making about its axis and it appears to be quite stable. It looks as if it will hold through out the sleep period. At the present time Apollo 15 is 86,650 nautical miles from earth. The spacecraft velocity is 5,789 feet per second. Checking with the science support room, we have some statistics on the temperature excursions experienced by the lunar surface experiments packages at the Apollo 14 and Apollo 15 sites. The Apollo 14 station went through the largest temperature swing during the eclipse. It started at 173.9 degrees above zero Fahrenheit, and during the maximum point of the eclipse, it was down to 150.6 degrees below zero, for a temperature swing of 324.5 degrees. The Apollo 15 station measured a somewhat smaller swing. It started at 140 degrees above Fahrenheit and dropped down to 143.2 degrees below Fahrenheit. These temperatures were measured on the top of the sun shield above the central station on both ALSEP packages. During the crew rest period we'll take the air to ground line down, keep the tape recorders running and play back any conversations that we might have with the crew, should any arise. At 278 hours, 4 minutes this is Apollo Control, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/7/71 GET 281:27 CDT 2:01 731/1

PAO This is Apollo Control at 281 hours
27 minutes. The crew of Apollo 15 asleep at this time.
Five hours and 2 minutes remaining until they will be awakened
for preparations for entry and earth-landing later this
afternoon. Splashdown clock showing 13 hours 43 minutes
until splash. The spacecraft at this time is 74,650 nautical
miles out in space approaching earth. Velocity continuing
to increase, now showing 6435 feet per second. Current
vector on the spacecraft still showing entry angle and entry
interface at minus 6.5 degrees. The vacuum perigee, 21.1
nautical miles. Maroon team of flight controllers here in
the control center settled in for the graveyard shift watching
the replay of yesterday's in-flight press conference. At
281 hours 29 minutes, this is Apollo Control.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/7/71, 7:04 CDT, 286:30 GET, 732/1

CAPCOM Su Sois, good Endeavour crew. Su Sois.
Rise and shine. It's splashdown day.

SC Oh, my.

CAPCOM Good morning, Dave.

SC Good morning, Joe.

SC That got everybody up.

SC Morning, J.B.

CAPCOM Good morning, Alfredo.

SC Joe, sounds like you're really in
harmony this morning.

CAPCOM That's once.

PAO This is Apollo Control. Apparently
the crew of Apollo 15 is very definitely awake after having
the Hawaiian War Chant come up the air waves. The heart
rates on the cardioscope here jumped somewhat on the flight
surgeon's console as the music began. That particular ver-
sion of Hawaiian War Chant done by Al Kealoha Perry. Apol-
lo 15 now 53 782 feet - as you were miles - nautical miles
from earth approaching at a velocity of 7940 feet per second.
8 hours 35 minutes till splashdown.

SC Houston, Endeavour. We got a post-
sleep checklist for you.

CAPCOM Okay, Dave. Go ahead.

SC Okay. About 8 hours apiece on the
sleep and ready for your consumables.

CAPCOM Roger. And 286 plus 30, RCS total
36 percent. Quad A 41, 36, 30, 37, H2 tank 27, 24, and 29,
O2 tank 43, 44, and 37. I've got the world's smallest list
of updates for your flight plan and I've got the news summary
when you're ready.

SC Okay. Give us a couple of minutes
on those. Thank you.

END OF TAPE

CAPCOM and 37. I've got the worlds smallest list of updates for your flight plan and I've got the news summery when you're ready.

SC Okay, give us a couple of minutes on those. Thank you.

AX Houston, Endeavour.

CAPCOM Go ahead.

SC Well we just got our first view of the earth this morning and can you believe it's getting larger and it's getting smaller. It can be just a very, very thin sliver of a very large round ball. (garble)

CAPCOM Rog Dave. I believe that.

SC Go ahead with the up dates Joe.

CAPCOM Roger Dave. These are the flight plan updates for today and would you believe I don't have any DAP load changes to give you which is fortunate. The first addition is at 288 plus 18, and it reads X-ray to off, Alpha particle to off.

SC Okay 288 18 x-ray off and Alpha off. Go ahead.

CAPCOM Roger and all the rest are just reminders really, the first one and on, at 290 on the UV photo's page, you've already changed the 2 frames line to read 1 frame at 20 seconds and the 2 frame at 2 seconds so a reminder to use mag Papa instead of mag Metro and finally we'd like to remind you to enable all jetts before beginning the maneuvers today, and we're thinking now we'll likely do a midcourse 7 correction of about probably around 5 feet per second. Over.

SC Okay, I got the UV on the change, and the mag Papa on the and enable all jets prior to maneuvers, and you're looking at midcourse 7 at 5. That's very interesting.

CAPCOM It's also not certain but we'll keep you posted on that, and that's all the official updates I have for you. I have a news summery if you'd like to listen.

SC Okay everybody is battered, go ahead.

CAPCOM Roger and this will be a short one. The rest of it you can read for yourselves today in the papers. Congress has started a month long summer recess, setting the pattern for a government wide exodus likely to make Washington a virtual ghost town for the rest of August. The Senate finally quit at 7:30 friday night more than 6 hours after the House had adjourned at about 1 in the afternoon. And after passing an 18 billion dollar higher education bill and 3 key appropriations measures. Besides the Labor-HEW appropriations the Senate approved Friday a 1 billion measure to provide public service jobs mainly for Viet Nam veterans and a continuing resolution to fund agencies still without regular appropriations until the 15th of October. In Chile 4 government ministers presented their resignations to president Salvador Allende on Friday causing the

CAPCOM first cabinet crisis since the president took office last November. I have a long list of baseball scores which I think I'll skip over here, in exhibition football the Buffalo Bills downed the New Orleans Saints 14 to 10 and the Cowboys won over the L. A. Rams 45 to 21. In the American Golf Classic at the Firestone Country Club in Akron, Ohio, Jerry Heard is still leading with 7 under par 133 at the half way mark. And Bob Lunn is next with a 4 under par 136. The United States basketball team was eliminated yesterday in the Pan-American games in Columbia and the U. S. baseball team was upset by the Dominican Republic 5 to 4. In tennis Stan Smith is the last seeded player still in competition at the Western Championship in Cincinnati. And today in Chestnut Hill, Massachusetts, Marty Reissen meets Australian Ken Rosewall and South African Cliff Drysdale meets John Newcombe in the semi-finals of the US professional tennis tournament. And that's all I have from here. Over.

SC Okay, thank you, Joe. That's interesting.

END OF TAPE

SC Houston, 15. By the way where did the 5 feet per second come from? Do you want us to get our trusty navigator up there to navigate some more for you?

CAPCOM Dave it probably came from the uncoupled thrusting we were doing yesterday, other than that I'm not really sure. It's by no means certain anyway we'll just, I guess, be watching it today and get back with you with the final bit of information on it.

SC Very good. Just thought maybe we'd get our navigator to navigate again in a 1 probability as most of them have been so far.

CAPCOM Endeavour the Saturday morning weather report of the landing area reads high scattered, 2,000 scattered, 15 knot winds out of the east-northeast, 10 miles vis and waves going to 4 feet. It should be well above your personal minimums.

SC That looks very good. We appreciate that. Sounds like the recovery troops have things in hand as usual.

CAPCOM Yes indeed.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/7/71 GET 287:14 CDT 7:49 735/1

CAPCOM Endeavour, this is Houston. Requesting Gamma Ray gain step switch to center, please.
SC Roger. Gamma Ray gain step to center.
CAPCOM And Endeavour, this is Houston. SIC over and out.
SC Hey, Mr. SIC, congratulations on a super job all the way. Sure appreciate it.
CAPCOM Roger, Dave. Likewise in every way. See you at Ellington.
SC Okay, very good.
CAPCOM Roger, 15. Go ahead.
SC Good morning, Bob. Okay, for Al it's 25034 and mine is 08041.
CAPCOM Roger. You got one for Dave?
SC His is not working any longer.
CAPCOM Okay.
PAO This is Apollo Control at 288 hours 5 minutes. Apollo 15 is 46 778 nautical miles from earth. Velocity 8622 feet per second. We're 7 hours 5 minutes from landing. Apollo 15 will perform the midcourse correction number 7. Looking right now at time very close to the flight plan. Midcourse, somewhere around 291 hours 56 minutes. And it will be on the order of 5 feet per second. We will use the reaction control system attitude thrusters on the Service Module for this midcourse. We will get some more tracking before we firm up the burn and the time. Tracking during the sleep period last night while the spacecraft was in a stable trajectory shows that the trajectory was perturbed somewhat during the maneuvering yesterday while the crew was performing some of the experiments and photography work. So a midcourse will be required. At 288 hours 7 minutes, this is Mission Control, Houston.
PAO This is Apollo Control at 288 hours 22 minutes. The SIM Bay experiments have been completed for this Mission. Flight Director Gene Kranz logged the time at 288 hours 17 minutes when the SIM Bay was secured for the final time.
PAO This is Apollo Control at 288 hours 27 minutes. Apollo 15 has ended passive thermal control rotation now. The crew will shortly be realining the inertial platform and then will go through a series of cislunar navigation star siting.

END OF TAPE

CAPCOM Apollo 15, Houston. Over.
SC Go ahead, Houston.
CAPCOM Okay, Jim. If you guys have a moment or two, we have some flight plan update concerning entry. Our entry cue cards and entry checklist, over.
SC Stand by.
SC About -- it'll be about a half an hour before we're ready to talk about changes.
CAPCOM Okay, Jim. Give me a call when you're ready.
SC Okay.
SC Houston, 15, I have some valve temp for you.
CAPCOM Roger. 15. We're ready to copy.
SC Okay, 5C is 4.5. 5D is 4.4, 6A 4.4 4.4, 4.6 4.5.
CAPCOM Roger, copy.
CAPCOM Apollo 15, Houston. Be advised, we are looking at the present time at a midcourse 7 burn of 5.6 feet per second retrograde. Over.
SC Okay. We copy.
PAO This is Apollo Control at 288 hours 55 minutes Apollo 15 now 42587 nautical miles from Earth. Velocity 9094 feet per second. The retrofire officer expects to have the final midcourse numbers ready about 289 hours 30 minutes. We'll pass them up to the crew shortly after that. We expect the midcourse at about 291 hours 56 minutes. Presently, it looks like a 5.6 feet per second it will be with the Reaction Control System. Burn time will be on the order of 13 seconds. We're still in the entry corridor on the -- on the present trajectory without a midcourse. However, the midcourse would put us in the center of the corridor and that's where we want to be. If we entered on the present trajectory without a midcourse, we would probably land about 60 miles short of the landing point.
CAPCOM 15, Houston. We have your turquing angles.
SC Rog, thank you.
PAO This is Apollo Control at 289 hours. Apollo 15 is maneuvering now to the proper attitude for the cislunar navigation star sightings.
CAPCOM Apollo 15, request omni Charlie, please.
SC Roger. Omni Charlie.

END OF TAPE

CAPCOM Guidance CAPCOM.
GUIDANCE CC Go ahead capcom.
PAO This is Apollo Control at 289 hours 22 minutes. Apollo 15 is 5 hours 36 minutes from entering the earth's atmosphere. Endeavour now 40 241 nautical miles from earth. Velocity 9 386 feet per second. And it's 2 hours 33 minutes to the midcourse burn.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/7/71, 10:04CDT, 289:30GET, 738/1

CAPCOM Okay, 15. The first change is in the entry checklist, second page and on page 1-2, we wish to delete step 21; which is the DSKY condition light DAP.

SC Okay. Step 21 deleted.

CAPCOM You may remember that one from the SIM; that's the one with the - gives us the P35 and turns the sensors off momentarily.

SC Yeah. I guess we don't want to do that one.

CAPCOM That's a rog. Okay. The next one, Dave, is on page 6, when we're checking the circuit breaker configuration on panel 8 and we're going to add: SPS pilot valve A main A and B main B open. Verify. Over.

SC Okay. SPS pilot valves main A and B both open, and configuration of circuit breakers on panel 8. Go ahead Bob.

CAPCOM Okay. Then if we get down to the entry cue card, down to the P67 section.

SC Okay. Go.

CAPCOM Okay. Down there near the middle where it says: Steering commands downrange error minus 6 to 0, that should be changed to downrange error minus 24 to 0. Over.

SC Rog. Just like it is in the checklist. Right? And I think we noticed that last night looking it over.

CAPCOM Okay. And next on the second line under the noun 68, there's a comment that says negative (is plus: EMS) and there's a certain amount of happiness with that statement down here. They say that you can have a positive H dot P67 nominally and therefore the statement on the cue card that this is a fail indication is not a good idea. I understand Vance discuss this with Al beforehand.

SC Okay. We'll scratch that. I don't think we'll get to a P66, 67 turnover anyway, but we'll scratch that one out. Thank you though.

CAPCOM Roger on that. And we have a question here Dave, that we need an answer for apparently concerning stowage. People are concerned about the hooks on the back of the R12 - the flight data file container, which is now stowed in one of the PGA bags. They are concerned that those hooks be placed in such a way that they will not be in any danger of piercing the aft bulkhead, the pressure bulkhead. So I guess you can tell how they're placed or what's underneath them, cause we've had such occurrences.

SC Okay. We'll make sure of that, and I guess the problem with R12 was that once we got all the LM data onboard, we didn't have any place to put it, or else we didn't have any place to put the LM data, and if you have any better suggestions on where to put them, we'll be glad to do it.

CAPCOM I don't think we have any right now, Dave. I guess the quickest thing would have been to just put it in the

APOLLO 15 MISSION COMMENTARY, 8/7/71, 10:04CDT, 289:30GET, 738/2

CAPCOM PGA bag with the hooks pointing up.

SC Okay. We'll do that.

CAPCOM And one reminder Dave. You guys undoubtedly know it. Just a reminder that you will not have any back lighting for the scroll and no lighting on the roll bug today.

SC Okay. No back lighting for the scroll and no lighting on the roll bug. Thank you.

SC Have anything else, Bob?

CAPCOM No, Dave. That's all I have for the moment.

SC Okay. That's good.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/7/71 GET28939 CDT1013 739/1

SC Houston we're standing by for a VHF COMM check.

CAPCOM Stand by Jim. We'll see if they're ready. 15, Houston. We'll have to stand by for another few hours to get you close enough to do that VHF COMM check.

SC All right. Roger. We understand.

CAPCOM Apollo 15, Houston.

SC Houston, 15. Go.

CAPCOM Roger. Could we have a reading of the - an onboard reading of the portable tank quantity, please.

SC 82 percent.

CAPCOM Copy 82 percent.

CAPCOM Apollo 15, Houston. Over.

SC Houston, 15. Go.

CAPCOM Roger. Could you guys check the portable tank inlet valve again for us and find out whether it is in the closed or open position. Once again what we're seeing is the waste tank increase in the portable tank has been staying constant all morning.

SC Okay last night when you called I even went down and recycled that valve and made sure it was in the detent end in the open position in which it was.

CAPCOM Okay. In that case, could you go down and cycle it from closed to open again for us, please.

SC Rog. We're doing that right now. It was still open and Al cycled it from open to closed and back to open.

CAPCOM Okay. Thank you. It's no big deal Dave, nothing to worry about.

SC Might as well get everything all trimmed up.

CAPCOM That's what we're trying to do.

PAO This is Apollo Control at 289 hours, 49 minutes. Apollo 15 is 37,858 nautical miles from Earth, velocity 9,709 feet per second. The crew will be taking some ultraviolet photography of the Earth in a short time. This will complete their science tasks for the mission. We'll then do the midcourse burn. Two hours, 6-1/2 minutes away from that burn. They will perform some more star sightings after the burn and then the rest of the time will be devoted to their preentry checklist. Recovery Carrier Okinawa is reported on the station. Weather in the recovery area is good. Visibility 12 miles, waves about 3 feet.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/7/71 GET 290:00 CDT 10:34 740/1

CAPCOM Apollo 15, Houston. Requesting OMNI delta.
SC OMNI delta.
CAPCOM Apollo 15. Requesting OMNI CHARLIE.
SC OMNI CHARLIE.
PAO This is Apollo Control at 290 hours 8 minutes. Apollo 15 has completed the ultraviolet photography of the earth and is now maneuvering to an attitude to take some moon photographs.
CAPCOM 15, Houston. If you'll give us high gain and PITCH of plus 7, YAW of 250. Then we'll be able to keep high gain for the next 2 or 3 hours, and I won't have to keep calling you for OMNI's. Over.
SC Okay, understand. Plus 7 and 250 on high gain.
CAPCOM Roger.
CAPCOM 15, Houston. We're noticing some drift in ROLL. If you're not through with the UV photos, we'd like you to retrim back to attitude, please.
SC Okay, and we are finished with the UV photos.
CAPCOM Okay, that takes care of that one.
CAPCOM Apollo 15, Houston. Over.
SC Try it, Bob.
CAPCOM Okay, if you guys got a minute, we can do a few things here. Number 1, if you give us ACCEPT we will send you some state vector and target loads, and number 2, we have a couple comments to read to you.
SC Okay, you have ACCEPT and stand by.

END OF TAPE

SC Okay, you have ACCEPT, and stand by.

CAPCOM Roger, you're getting the up link and we're standing by.

CAPCOM 15, the computer's yours. You have state target and REFSMATT.

SC Rog. Thank you.

SC And Houston we're all on. You can go with you're comments.

CAPCOM Okay, first one news concerning the water business. We've been having you check that valve. It looks to us now as though there was a blockage into the portable tank. You got obviously far more water than you need to survive the rest of the mission, but it does mean that the waste tank will be filling up and there is a possibility that it will start to vent about an hour or two before EI. It's been discussed down here and decided that the best way to do this is while it's not disturbing the vector too much is to let it relieve overboard and not to do a dump ahead of time or turn the water boiler on ahead of time. In line with this we might just verify that the pressure release valves down on panel 352, the water control panel, is in the release position. It certainly should be there, it's just a little verification to make sure we're not going wrong there. Second I -

SC We verify.

CAPCOM Okay, thank you. Second item is we suggest that it might be reasonable to put some tape over the SPS light on the EMS to keep you from confusing with the .05 G light, in case you have a problem there A1. You're option obviously, it just a suggestion.

SC Oh, I don't think he'll have any confusion with that.

CAPCOM Okay.

SC We'll make we watch it.

CAPCOM And the third question is from your comments when we were talking about R12, some people believe you may be asking us a question that you have a problem with stowage of some of the extra LM data file, or have you found a place for that already.

SC Oh no, that's all tucked away in R3 very neatly. We have no problem at all in the stowage. We just wanted to locate R12 in a nice soft spot and secure it down, which it is.

CAPCOM Okay. We were crack up building 45 to find you a location if you needed it.

CAPCOM And 15 Houston. We've got an entry pad and a midcourse 7 pad if you're ready to copy.

SC Stand by one, Bob. Let our pad leader get out his pencil. Okay Bob. I'm ready for midcourse 7.

CAPCOM Okay. Put this midcourse 7. RCS G&N 263 63 noun 48's are NA and NA. 291 56 47 90 minus 00056 minus all balls plus 00002.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/7/71, 11:09CDT, 290:35GET, 742/1

CAPCOM all balls plus 00002 roll 180 311 000 HA NA
HP plus 00223 00056 024 000 56 31 3479 353; the rest of the
pad is NA; GDC aline stars are Vega and Deneb; roll, pitch,
and yaw for the alinement are 100 137 316. Burn recommendation
is 2 jets plus X quads Bravo and Delta. And the HP in the
pad on noun 44 there is based on a MSFN trajectory after
midcourse 7. Over.

SC Okay. The readback for the midcourse. RCS
G&N 26363 NA NA 29156 4790 minus 00056 minus all zeros plus
00002 180 311 000 NA plus 00223 00056 024 00056 31 3479 353
Vega and Deneb, 100 137 316, recommendation for the burn
configurations 2-jet, plus X, quads Baker and Dog and the
HP of the pad is based on MSFN trajectory after midcourse 7.

CAPCOM Roger. Good readback, Jim, and I'll give you
entry when you're ready.

SC Okay. Stand by.

SC Okay. I'm ready for entry, Bob.

CAPCOM Okay. Entry. Area Midpack 000 153 000 294
41 55 267 plus 26 13 minus 158 13 061 360 96 649 108 24 361
78 294 58 55 00 28 noun 69s are NA, 400 02 13 00 18 03 37
07 42 04 14 03 375 213 down 095 right 47 lift vector up
comments: (1) use nonexit EMS battery, (2) RET for 90K 6 plus
04, (3) RET for mains 8 plus 30, (4) RET for landing 13 plus 27,
(5) constant g roll right, (6) moonset 294 56 37. Over.

SC Okay, Bob. A readback for the entry pad.
It's Midpack 000 153 000 294 4155 267 plus 2613 minus 15813
061 36096 649 10824 36178 2945855 0028 noun 69 is NA 400 0213
0018 0337 0742

END OF TAPE

CAPCOM 0037 0742 04 1403 375 213 down 095 right
47 up. Comments: Use non exit EMS pattern, RET for
90J 6 plus 04, for mains 8 plus 30, landing 13 plus 27.
constant G ROLL right P00 and ACCEPT 294 plus 56 plus 37.
Over.

CAPCOM Roger. Good readback, Jim.

CAPCOM And 15, we'd like accept again and it looks
like we found some errors in the load that we sent up.

SC Okay, stand by.

SC Okay, you have accept.

CAPCOM Thank you.

SC (garble)

SC Houston, 15. We thought the verb keys
were on top of you. Sorry about that. It's all yours.

CAPCOM Okay.

CAPCOM 15, we'll clear it. Don't worry.

CAPCOM 15, Houston. The computer's yours again.

SC Roger, Bob.

CAPCOM Apollo 15, Houston. We would like the
VHF turned on even though it's too early to do the COMM check.
Like it turned on in simplex alpha to warm it up and so we
can watch it.

SC Okay, we're turning on Simplex alpha.

CAPCOM Thank you, 15.

PAO This is Apollo Control at 290 hours 54 min-
utes. Apollo 15 now 31 707 nautical miles from earth,
velocity 10 674 feet per second. We're an hour and 2 min-
utes away from the midcourse burn that will be performed at
291 hours 56 minutes 47 seconds, delta v of 5.6 feet per
second. We'll use 2 jets and the duration of the burn will
be 24 seconds. Based on a successful midcourse 7, the
elapsed time for entry interface with the atmosphere at
400 000 feet - will be 294 hours 58 minutes 55 seconds.
Spacecraft velocity at that time, 36 096 feet per second.
And the range to go to the landing point 1082.4 nautical
miles. The elapsed times of entry events from the entry
interface time - we'll begin blackout 18 seconds after
entry interface. Blackout will end 3 minutes 37 seconds,
drogue chutes 7 minutes 42 seconds, main chutes 8 minutes
30 seconds, and landing 13 minutes 27 seconds. The coordinates
of the aim point for landing 158 degrees 8 minutes west
26 degrees 8 minutes north.

CAPCOM And 15, we have your torquing angles.

SC Okay.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/7/71 GET 290:59 CDT 11:33 744/1

SC Houston, 15. Do you have the torquing angles?

CAPCOM Roger, 15. We have the torquing angles.

SC Okay. That's through.

PAO This is Apollo Control at 291 hours and 11 minutes. Apollo 15 is maneuvering now to the midcourse burn attitude. That burn is scheduled in 45 minutes.

PAO This Apollo Control at 291 hours 29 minutes. We're 27 minutes away from the midcourse burn. And Apollo 15 is 28159 nautical miles from Earth. Velocity 11347 feet per second. In the next 3 and a half hours at which time Apollo 15 will enter the atmosphere. That velocity will build to 36000 feet per second.

CAPCOM Apollo 15, request OMNI Alfa, please.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/7/71 GET29141, CDT1215 745/1

PAO This is Apollo Control at 291 hours, 46 minutes. We're 10 minutes away from the midcourse burn now. Distance 26,285 nautical miles from Earth. Velocity 11,743 feet per second.

CAPCOM 15, 5 minutes to go. You are looking good.

SC Roger. Thank you we're all set.

CAPCOM 15, Houston. Requesting key release and ENTER to complete the integration and get us down ready for the burn.

SC Houston, the integration should all be done.

CAPCOM Rog, somebody on the ground here hadn't seen it apparently.

SC Okay we've been sitting here for about 5 or 6 minutes.

CAPCOM Rog, we couldn't tell. Sorry about that, Dave.

PAO 1 minute. Apollo 15 is thrusting. GC says it looks like a good burn.

SC Okay Houston, 15 with the burn status report.

CAPCOM Roger that.

SC Okay take was on time. Burn time was 21 and it came right out on the money and it clicked up a couple of seconds after the shutdown to minus .1, 0 and minus .1. Delta VC was plus point 8.

CAPCOM Roger, copy that Dave. It looked good to us.

SC Good.

CAPCOM 15, OMNI Bravo, please.

SC Roger, OMNI Bravo.

PAO This is Apollo Control at 292 hours, 1 minute. Telemetry shows Apollo 15 maneuvering to the optics calibration attitude as the crew gets ready to perform some additional cislunar navigation star sightings.

CAPCOM Apollo 15, Houston, if you will give us ACCEPT after you get maneuvered to uplink before you go into P23 to start the optics count we'll GARBLE your new state vector and then you can press on with the P23's as soon as that is up.

SC Roger. You've got it.

CAPCOM Roger.

CAPCOM 15, Houston. The computer is yours.

SC Roger.

CAPCOM And 15, requesting OMNI Charlie.

SC Roger, OMNI Charlie.

PAO This is Apollo Control, at 292 hours, 11 minutes. Apollo 15 is 2 hours, 47 minutes away from the Earth's atmosphere, 3 hours away from landing in the Pacific Ocean, about 285 nautical miles north of Oahu, Hawaii. Endeavour's distance from Earth now is 23,494 nautical miles. Velocity has built to 12,410 feet per second.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/7/71 GET29214 CDT1248 746/1

PAO This is Apollo Control the command module service module separation time listed in the flight plan is valid. 294 hours 43 minutes.

PAO This is Apollo Control at 292 hours 21 minutes. The Apollo 15 backup crew has joined capcom Bob Parker at his console. Dick Gordon, Vance Brand and Jack Schmitt.

PAO This is Apollo Control. Flight director Gene Kranz has now been joined by the other flight directors for this mission. Gerry Griffin, Glynn Lunney and Milton Windler and the management officials are beginning to assemble. At the department of defense console is Maj. Gen. David M. Jones, the DOD manager for manned spacecraft support. Mission director Capt. Chester Lee is here. Dr. Rocco Petrone the Apollo program director and Col. James McDivitt, the Apollo Spacecraft program manager.

PAO This is Apollo Control at 292 hours 35 minutes. Flight dynamics reports that the tracking data accumulated so far since the midcourse burn shows that that burn did what it was designed to do. That is put Apollo 15 in the center of the re-entry corridor. They'll continue to collect data and verify that.

PAO This is Apollo Control at 292 hours 42 minutes, Apollo 15 now 19 927 nautical miles from earth. Velocity 13 434 feet per second. We're 2 hours 16 minutes away from entry interface and about 2 and a half hours away from landing.

SC Houston, 15.

CAPCOM 15, go ahead.

SC Roger, we're ready for logic sequence check.

CAPCOM 15, we're ready for a logic sequence check also.

SC Okay, sequencer logic coming on now, number 1, number 2.

CAPCOM And 15, you're go for pyro arm.

SC 15 Roger.

PAO This is Apollo Control at 293 hours Apollo 15 now 17 680 nautical miles from earth. Velocity 14 190 feet per second. Apollo 15 is 1 hour 58 minutes away from entry interface. 2 hours 11 and a half minutes away from landing. During entry, the prime recovery ship, the helicopter carrier USS Okinawa will be about 5 nautical miles north of the aimed point. In the vicinity of the carrier 2 helicopters will be airborne. Call signs Photo and Relay. Photo helicopter will have the photographers aboard. Relay will carry backup swimmers and act as a radio relay between the carrier and the spacecraft, and the other helicopters in the area. Swim 2 helicopter will be the prime

APOLLO 15 MISSION COMMENTARY 8/7/71 GET29214 CDT1248 746/2

PAO helicopter to deploy swimmers with the floatation collar. Swim will be 5 nautical miles south of the aimed point at entry. Swim 1 will be the backup for Swim 2 and the Swim 1 swimmers will be deployed to recover the parachutes. Swim One's location during entry 10 nautical miles west and 15 nautical miles north of the aimed point. The recovery helicopter, the helicopter which will recover the crew will be 10 nautical miles east and 15 nautical miles north of the aimed point at entry.

END OF TAPE

PAO The recovery helicopter will be piloted by Commander Stephen A. Coakley of Chula Vista, California. His co-pilot Lieutenant Junior-Grade John M. Murphy, Jr., of La Jolla, California. Crewmen are Aviation Machinest Mate First Class Ernest L. Skeen of Oklahoma City, and Aviation Electronic Technician Second Class Thomas R. Hardenbergh of East Lansing, Michigan. A Manned Spacecraft Center Flight Surgeon, Dr. Clarence A. Jernigan of Dickinson, Texas will also be aboard Recovery helicopter. Swim Two the prime flotation collar helicopter is piloted by Lieutenant Commander, David D. Cameron, Jr., of Pala Alto, California; co-pilot Lieutenant Junior Grade, Stephen M. Lind of Olympia, Washington, Crewman Aviation Machinest Mate Second Class John H. Driscoll of Whitehouse Station, New Jersey, and Aviation Electronics Technician Third Class Bryce E. Devenport, of Glenss Ferry, Idaho. The swim team leader on that helo is Lieutenant Junior Grade, Fred W. Schmidt of Northbrook, Illinois. Swimmer Number 2, Quartermaster First Class William C. "Jake" Jakubowski of Lachawanna, New York. Swimmer Number 3 Yeoman Third Class Rudy R. Davis of Ashland, Kentucky. Swim One is piloted by Lieutenant Donald M. Larsen of Wellman, Iowa; co-pilot Lieutenant Junior grade Eric J. Challain of Olympia, Washington; Crewmen are: Aviation machinist mate Second Class Larry G. Parker of Ringold, Georgia and Aviation Anti-Submarine Warfare Technician Airman Thomas F. Sharafik of Hayward, Wisconsin. The swim team leader on swim one is Warrant Officer Jerry L. Todd, Sturgis, Michigan, swimmer number 2 is Ship Fitter Third Class Frank S. Schroeder, Malvern, Pennsylvania and swimmer number 3 Radioman Seaman Roy Alan Buehler, Carrollton, Missouri.

CAPCOM Apollo 15, Houston. Over.

SC Houston, 15. Go.

CAPCOM Roger. Thought I'd just let you know from our preliminary tracking you're sitting right in the center of the corridor now.

SC Great. That's a nice place to be.

CAPCOM The best.

PAO This is Apollo Control at 293 hours 19 minutes. Apollo 15 now 15 225 nautical miles from earth. Velocity 15 173 feet per second.

PAO This is Apollo Control. The flight crew aboard the helicopter, which will provide photo coverage for recovery operations. The pilot is Lieutenant Commander John M. Quarterman of Brunswick, Georgia; the co-pilot Lieutenant Junior Grade Ronald D. Martin, Roanoke, Virginia, Crewmen are Aviation Structural Mechanic Second Class Douglas P. Walker of Selma, Alabama, and Aviation Machinist's Mate Airman Gregory G. Wahl of Santa Monica, California. The crew aboard the relay helicopter Pilot is Lieutenant Michael T. Boyce, Bainbridge Island, Washington; co-pilot --

CAPCOM And 15, we copy your torquing angle.

APOLLO 15 MISSION COMMENTARY, 8/7/71, 13:37CDT, 293:03GET, 747/2

SC Roger. Thank you.

PAO Relay's co-pilot is Lieutenant Junior Grade Timothy D. Kelly, Long Island, New York; Crewman ADR First Class Raymond D. Brooks of Nampa, Idaho; and Aviation Anti Submarine Warfare Technician Airman Ronald C. Weaver, Madcroft, Wisconsin. The backup swimmers aboard Relay: the swim leader is Lieutenant Junior Grade Jonathan Smart of Belmont, Massachusetts; swimmer number 2 is Ship Serviceman Second Class William Ramos-Flores of Bayamon, Puerto Rico and swimmer number 3 is Boilerman Third Class Roderick T. Yonkers, Brookfield, Connecticut.

END OF TAPE

PAO This is Apollo Control with a correction on the home state of Ronald C. Weaver, one of the crewmen on the Relay Helicopter. He is from Madcroft, Wyoming.

SC Houston, 15.

CAPCOM Roger, 15. Go ahead.

SC Okay, MS check worked fine.

CAPCOM That sounds good.

PAO This is Apollo Control at 293 hours 37 minutes. Mr. and Mrs James Irwin, the parents of Apollo 15's Lunar Module Pilot have arrived in the viewing room here at the Control Center. Also, in the viewing room at this time, Dr. George M. Low, the Deputy Administrator of NASA, and Dale Myers, the Associate Administrator for Manned Space Flight. The MSC Deputy Director Christopher C. Kraft and the Director of Flight Operations Sigurd Sjoberg are in the Control Room proper at this time.

PAO This is Apollo Control. Donald K. Slayton, the Director of Flight Crew Operations has joined CapCom Bob Parker and the Apollo 15 Backup Crew at the CapCom Console.

PAO This is Apollo Control. Congressman William Archer and his Mother, are now in the viewing room. And at 293 hours 45 minutes Apollo 15 is 11 611 nautical miles from earth, velocity 17 024 feet per second.

CAPCOM Apollo 15, Houston. If you'll give us ACCEPT, we'll send you up a final state vector.

SC Roger, Houston. You've got it.

CAPCOM And Roger, you're getting it.

CAPCOM And 15, it's your computer again.

SC Roger.

CAPCOM Apollo 15, Houston. We have another entry pad for you if you're ready to copy.

SC Okay, go ahead Bob.

CAPCOM Roger, Jim. It's still mid Pacific 000 153
000 294 41 54 267 plus 2613 minus 15813 062 360 96 651 108
49 361 78 294 58 54 0029 noun 59's are NA, 400 02 12 00 18
03 37 07 44

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/7/71 GET 293:56 CDT 14:30 749/1

CAPCOM 337 07 44, foresight and sextant stars are NA since you've done them. Lift vector is up. Comments 1, use non-X EMS battery. 2, RET of 90K 6 plus 06, Mains, 8 plus 32. Landing 13 plus 29, constant G is roll right. Moon SEP 294 5637. Over.

SC Okay. Your readback on the entry pad, Bob. Smith pad, 000 153 000, 294 41 54 267 plus 2613 minus 158 13 062 360 96 651 108 49 361 78 294 58 54 00 29 400 0212 0018 0337 0744. Left vector up, use non-X EMS battery. RET for 90, 6 plus 06, mains at 8 plus 32, landing 13 plus 29, constant G will be rolled right, Moon SEP 294 plus 56 plus 37.

CAPCOM Roger, Jim. Good readback. And I have some information on landing area and weather and recovery forces if you're ready to copy that.

SC Roger, go ahead.

CAPCOM Roger. The conditions of the recovery area continue to be good. Two thousand scattered high scattered visibility 10 miles. Winds are 10 knots out of the east and wave heights have come down to 3 feet. Altimeter at 3006. The Recovery Forces, the aircraft carrier is Okinawa, we have 3 helos, Swim 2, Swim 1, and Recovery. And Swim 2 is estimating to be on station after Splashdown within 5 minutes. The 2130's in the area will be Hawaii Rescue 1 and Hawaii Rescue 2. Over.

SC Okay. Understand the weather is generally good. It's 2000 scattered 10 10 knots from the East. 3 foot waves, altimeter 3006. Okinawa is there. The helos are Swim 2 and 1 and Recovery C1 30's or Hawaii Rescue 1 and 2.

CAPCOM Roger, Jim. That's right and noting on the altimeter, that means your DELTA-H is minus 128.

SC Understand. Roger.

PAO This is Apollo Control at 294 hours 3 minutes We've sent up the final entry pad now. Those numbers did not change very much from the preliminary pad. Entry interface at 294 hours 58 minutes 54 seconds. The aim point -- or the landing point remains the same. 26 degrees 8 minutes north, 158 degrees 8 minutes West. Maximum G load 6.2. Velocity at entry on the atmosphere 36096 feet per second. Range to go at time 1084.9 nautical miles. At the elapsed time for events from entry interface begin blackout 18 seconds in blackout 3 minutes 37 seconds. Drogue chutes at 7 minutes 44 seconds. Main chutes 8 minutes 32 seconds and landing 13 minutes 29 seconds.

SC Houston, 15.

CAPCOM Roger, 15. Go.

SC Rog, we're getting ready to activate Command Module RCS and turn on logic (garble).

CAPCOM And 15, we're ready to watch you.

SC Okay, project 1 coming on now. Project 2 on

APOLLO 15 MISSION COMMENTARY 8/7/71 GET 293:56 CDT 14:30 749/2

SC now.
CAPCOM Roger. Your go for fire alarm.
SC Roger. Go for fire alarm.
SC Okay.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/7/71 GET29407 CDT1441 750/1

CAPCOM 15 your CM RCS press looks good to us.
SC Rog, Houston.
PAO This is Apollo Control at 294 hours, 8 minutes.
Apollo 15 is 8,018 nautical miles from Earth and velocity
19,685 feet per second. Endeavour is 50 minutes away from
the Earth's atmosphere, 1 hour 3-1/2 minutes away from
landing. Command Module Service Module separation is still
scheduled at 294 hours, 43 minutes.
SC Houston, 15, testing the command module
thrusters.
CAPCOM Roger, we're watching.
SC Okay, Houston, 15 running 1 test now.
CAPCOM Roger, Ring 2 looks good. 15, ring
1 looks good to us also.
SC Roger, Houston. Houston, 15.
CAPCOM Go.
SC Can you see the solar lights operating down
there? We can't hear them up here.
CAPCOM Roger, 15. That's what we're watching and we
verified them all.
SC Okay, thank you.
CAPCOM You are welcome.
PAO This is Apollo Control. Congressman Bob Casey
is in the viewing room now. His district includes the
Manned Spacecraft Center.
CAPCOM Apollo 15, Houston. Over.
SC Houston, 15. Go ahead.
CAPCOM Roger. We were unable to monitor rates down
here because we weren't set up for it and we'd like to sug-
gest that you might go back and repeat that check again. We
suggest excel command and SCS and you might try to monitor
rates onboard and we'll try to monitor them down here. What
we're looking at is only the solenoid down here and I guess
if you really push that isn't a verification.
SC Okay. We'll do that. Okay, Houston, 15 we're
ready to test them now.
CAPCOM All right we're ready to watch.
SC GARBLE.
CAPCOM 15, we're monitoring good rates. 15, Houston,
do you copy? We monitored the good rates down here also.
SC Okay, Houston, we copied and we're testing
ring 1 thrusters now.
CAPCOM 15, ring 1 looks okay to us again.
SC Okay, Houston, thank you.
PAO Distance 5,933 nautical miles, velocity
21,865 feet per second.
CAPCOM Apollo 15, Houston, we can try a VHF check
now if you will.

APOLLO 15 MISSION COMMENTARY, 8/7/71 GET29407 CDT1441 750/2

CAPCOM Apollo 15, Houston. Over.

CAPCOM Apollo 15, Houston. Over.

SC Go ahead Houston.

CAPCOM Rog, we're ready to try a VHF check if you will. We'd like you to go to VHF antenna left and all of you turn off your S-bands and turn on your VHFTR's.

SC Okay.

CAPCOM 15.

SC (Garble). Did that once, Bob, but I read you loud and clear but apparently you were not reading us.

CAPCOM That was apparently the case and Jim -

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/7/71 GET 294:27 CDT 15:01 MC751/1

SC Just that once, Bob, and I read you loud and clear, but apparently you were not reading us.

CAPCOM That's apparently the case, and Jim, I guess all we need is one of you to go to VHF TR and F-Band TR off.

SC Okay, I'll do that.

SC Houston, this is Apollo 15 on SIMPLEX A.

CAPCOM Roger, 15 on SIMPLEX A, read you 5-5.

SC Roger, I read you the same.

CAPCOM Okay, I guess that finishes it.

PAO Distance 4,727 nautical miles, velocity 23,437 feet per second. Flight Dynamics reports the latest update on tracking shows the Apollo 15 right in the middle of the corridor. Distance now 3,211 nautical miles, velocity 26,047 feet per second. This is Apollo Control, we are about 2 1/2 minutes away from Command Module, Service Module separation. Apollo 15 yawing now for that maneuver. Endeavour's in separation attitude now. We show separation. Recovery reports all forces on station ready to support.

CAPCOM Apollo 15, Houston. Comm check over.

SC Houston, 15, loud and clear.

CAPCOM Roger, same with you.

SC And Houston, 15. We got a good sep.

CAPCOM Roger, it looks good down here. Thank you.

PAO Velocity now 30,280 feet per second.

SC Okay Houston, the horizon check was good, and the CMC guidance needles look good.

CAPCOM 15, Houston, say again.

SC Rog, the horizon check was good and the CMC guidance needles look good.

CAPCOM Roger, copy. Very good.

PAO 10 minutes from entry.

CAPCOM Apollo 15, Houston, you're looking good, about a minute and a half till handover to ARIA.

SC Roger.

PAO And ARIA is an Apollo range instrument aircraft, we'll be handling communications through these aircraft.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/07/71 29454 GET 1528 CDT MC752/1

CAPCOM Apollo 15, Houston, thru ARIA 2, how do you read?

PAO We're at 3 and a half minutes away from entry interface. Communications through the ARIA will be noisy. We do not have a display up at the moment showing velocity or distance.

PAO Velocity 35,710 feet per second, range to splash 1725 nautical miles.

CAPCOM Apollo 15, Houston, thru ARIA 2, we're getting good data, you look GO.

PAO Velocity 35,910 feet per second, range to go 1507 nautical miles. 35 seconds to entry. 36,053 feet per second, range 1307 nautical miles. Should be at entry interface.

PAO We're in blackout now and no data.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/7/71 GET 29500 CDT 1534 753/1

SC 12, 12, 12, 12, 12, 12, 12, 12.

PAO Should be coming out of black out, now.

CAPCOM Apollo 15, Houston. How do you read?

SC Loud and clear.

CAPCOM Apollo 15, Houston. How do you read?

SC 15, the (garble) and we're (garble) about 10 miles.

SC Everyone is in fine shape.

CAPCOM Very good, Dave. We can hear you.

PAO Recovery ship has radar contact. Showing range about 100 miles.

SC Houston, 15, in the blind EMS (garble) agree in about 10 miles.

CAPCOM Roger 15, this is Houston. Read you loud and clear and copy.

END OF TAPE

SC Latitude plus 612, longitude minus 15817.
And about a 2.2 off the deck.
CAPCOM Roger, Dave. We copy, very good.
RECOVERY (garble) out of 42 and short about a .7.2.
PAO Should be on the drogue chute now.
RECOVERY This is (garble). I see your contact.
RECOVERY Bearing 1, 2, 0 from the ship.
RECOVERY Say that last contact.
PAO And he should be on the mains now.
RECOVERY This is Photo, I have visual contact again. I
have 1 20 from the ship one half mile bearing is 130 to three
main chutes. I have visual contact 3 main chutes.
OKINAWA Okinawa, Roger.
SC (garble) Apollo 15, we're showing about a
minus .6 on the miss distance. Everybody's in good shape.
CAPCOM Roger, 15. We got a visual on you on the
screen in here.
RECOVERY Okinawa Recovery has a recovery contact
during 175 magnetic on atation.
SWIM 2 Okinawa this is Swim 2. I have a visual con-
tacts appearing as 010 at approximately 1 mile. My position 134
Okinawa 8.5 miles. Attitude is about 6,000 feet to the (garble)
MARK.
SWIM 1 Okinawa this is Swim 1. I have recovery
becon at 115 degrees magnetic, and 27045 (garble).
RECOVERY This is Photo. Something's falling
besides the Command Module, I could not tell what it was.
RECOVERY Apollo 15, Apollo 15, this is Recovery. Over.
SC Recovery, Apollo 15. Everybody's in good
shape and we're looking at about 3500 feet.
RECOVERY That is good. Recovery, I have a visual
165 from you about 8 miles.
RECOVERY Houston, one appears to be swinging. (garble)
PHOTO Okinawa this Photo. The extra fuel has
jettisoned and burned.

END OF TAPE

PHOTO 1 Okinawa, this is photo 1. The extra fuel has been jettisoned and burned off.

RECOVERY Apollo 15, Apollo 15, this is recovery, over.

RECOVERY (garble) Apollo 15, Apollo 15, this is recovery, over.

SC Rog Recovery, 15 (garble) is clear; everybody's in good shape.

RECOVERY Roger Apollo 15. Did you hear? All units have you in sight and we are in bound now.

SC Roger.

OKINAWA Apollo 15, this is Okinawa. Request your splashdown read out, over.

SC Roger, plus 2613 minus 15812.

OKINAWA Apollo 15, this is Okinawa; you have a streamed chute. Stand by for a hard impact, Okinawa over.

SC Roger.

SC Splash down, mark splash down.

PAO Landing velocity on 2 chutes is 28 feet per second, or 32 feet per second, versus 28 feet on 3 chutes.

RECOVERY (garble) It is in stable 1 position. 3 main chutes are in the water, all visible around the spacecraft. One main shoot appears to be still attached to the command module, over.

OKINAWA Hello, this is Okinawa, mark on top, over.

RECOVERY This is (garble) roger (garble)

RECOVERY Apollo 15, this is Recovery, over.

SC Recovery, Apollo 15, everybody's in good shape.

PHOTO This is Photo, mark 1307 miles.

OKINAWA Okinawa read that.

SWIM 2 Okinawa, this is Swim 2 on station, be advised I dropped a smoke on the apex cover bearing approximately 010 to the command module at 150.

SC Okinawa, (garble) requests permission to drop our main chutes.

OKINAWA This is Okinawa, permission granted.

RECOVERY (garble) we're standing clear.

RECOVERY Apollo 15, this is Recovery, roger your (garble) on 243.0.

SC Recovery, 15 we're in good shape.

RECOVERY (garble) we in contact. ARIA 1 copying you loud and clear, go ahead.

RECOVERY (garble)

APOLLO 15 MISSION COMMENTARY 8/7/71 CDT 15:44 GET 295:10 755/2

RECOVERY We're in contact. We're in contact.

RECOVERY (garble) copying you loud and clear, (garble)

Okay, ARIA 1.

PHOTO The Command Module is still riding very well.

The 1 main chute is still attached (garble) Command Module.

The heat shield appears to have burned very evenly around the base of the Command Module. There is no real -

END OF TAPE

RECOVERY (Garble) the Command Module there is no real evidence of it streaming up the sides. (Garble) is approaching the spacecraft. The swimmer appears to be taking a good look at the Command Module before he goes in. Swim 2 may be preparing to grapple for one of the main chutes.

RECOVERY (Garble) Recover chutes if at all possible.
Over.

ARIA ARIA (garble).

PAO Recovery reports the swimmers will be going in shortly. One parachute still attached to Command Module. We would like to recover those parachutes.

RECOVERY (Garble). The Command Module, swimmers leaving the helicopter, 2 swimmers in the water.

ARIA (garble)

RECOVERY Two swimmers in the water are swimming towards the Command Module.

RECOVERY Okay, two swimmers are cautiously approaching the Command Module. One swimmer is swimming around the Command Module at this time. The swimmers have their (garble) Command Module (garble) the Command Module now.

RECOVERY The swimmers now are connecting the sea anchor. Swimmers deployed the sea anchor.

PAO Swimmers deploying the sea anchor now.

RECOVERY (garble) the sea anchors (garble).

RECOVERY It's a beautiful day out here, the sea state is almost a zero sea state, it's very calm, almost like a lake. The cloud cover is scattered cumulus, got about (garble).

RECOVERY The swimmers cut all the drag lines attached to the Command Module.

RECOVERY The other swimmer there is attaching another raft to the main parachute, and the lead swimmer is now deploying the sea anchor. Command Module at the present time is oriented down wind.

PAO Splash time 295 hours 11 minutes 58 seconds.

RECOVERY Swimmers now moving in the flotation collar (garble) swimmer (garble) recovery thumbs up from the swimmer. He is okay and the collar is now at the Command Module.

SC (garble)

PAO Swimmers attaching the flotation collar now.

RECOVERY (garble) the Command Module is pointing directly at the Photo Helicopter now.

SC (garble)

PAO A preliminary look at the splash point shows it to be 158 degrees, 4 and one half minutes west, 26 degrees 4 minutes north. Based on these preliminary numbers, that would be a miss distance of 5 and one half miles.

RECOVERY (garble)

SC (garble)

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RECOVERY (garble) Over.

RECOVERY All right. (garble)

RECOVERY (garble) Swimmers are now pulling the floatation collar around the Command Module. Both the VHF antennas appear to be resting on the Command Module. The flashing light is erected but it is not working, has not been turned on.

END OF TAPE

RECOVERY This is recovery (Garble).

PAO Recovery reports the Okinawa now 3 1/2 miles from the command module.

SC MARK (Garble) Houston.

RECOVERY The swimmers have the flotation collar almost completely around the command module.

RECOVERY (Garble) Now the swimmers now have the (garble)

PAO The ship now reports correction on that 6 1/2 miles from the command module.

RECOVERY The swimmers now have the flotation collar around the command module and it is afloat. The flotation collar is completely inflated.

PAO Recovery reports flotation collar completely inflated.

RECOVERY The swimmer (Garble) flotation collar and request (Garble) flotation collar to the (Garble). One swimmer is proceeding around to the window of the spacecraft and he's looking in at the Astronauts. We have a contact with the swimmer he has visual communications with the Astronauts in the command module. The swimmers now crawling into (Garble) to deliver the recovery raft. The swimmer is taking his (Garble) recovery raft around in the doorway. The swimmer is approaching the command module.

PAO Helicopter moving in to drop another raft now.

RECOVERY The recovery raft is being inflated. Recovery raft is inflated. It is being positioned along side of the command module next to the flotation collar.

RECOVERY The swimmers are taking the recovery raft to the flotation collar. One swimmer managed to inflate the recovery platform. I can see swim 1 in the distance. He is putting the swimmer in the water to attach the raft to the apex cover. The swimmers now have the recovery raft attached. One swimmer is getting into the recovery raft as he tried to remove the (Garble) where they can move more freely.

RECOVERY (Garble) to recovery 001 to (Garbel) bring the Astronauts flotation equipment out.

RECOVERY Recovery is approaching the command module. They have (Garble) approaching the water. The (Garble) is approaching the water, and is touching the water with (Garble). The command module is moving around on the surface of the water is usually (Garble) 001. The swimmer now has the recovery net on the raft platform and he is removing the equipment back up to the recovery helicopter. Recovery is now moving away.

PAO The ship reports that the helicopter has now delivered some life vests to the swimmer, and he will pass those into the crew and they will down them before being hoisted into the helicopter. We have heard from the crew since the landing they report their in good shape.

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RECOVERY (Garble) we see the waves from the helicopter. And cannot tell exactly what the swimmer is doing. It appears he is climbing up on the command module and securing the raft to the hatch side.

RECOVERY The hatch to the command module is now open.

PAO Hatch is open now.

RECOVERY (Garble) the Astronauts are passing their flotation equipment in to them.

PAO Handing in the life vests.

RECOVERY The swimmers talking to the Astronauts. We are now trying to close the hatch again.

END OF TAPE

RECOVERY -- to the astronauts as our tracks record the crashing in. Seems to be having some minor difficulty in regards to the cords. As we told you (garbled). We're waiting now for the astronauts to start their equipment, equipment prior to egressing the command module. (Garble) my captain here says at the moment the swimmers are preparing to (garble) the hatch and get ready for the astronauts to affirm that they are ready to leave the command module. The swimmers are (garble) to clear it up (garble).

PAO The ship reports it's about a half mile away from the command module now.

RECOVERY (Garbled) the swimmers now opening the hatch again.

PAO The swimmer is reopening the hatch now.

RECOVERY (Garbled) The first astronaut is climbing out of the command module. He is the second astronaut in the doorway of the spacecraft. He is on the recovery raft. The first astronaut is in the recovery raft. He is climbing out of the command module. (Garbled) The second astronaut is now in the recovery raft. The third astronaut is now out of the command module and all three are in the recovery raft. The swimmer is taking (garble) preparations for closing the command module hatch. The swimmers' closing the hatch.

END OF TAPE

SPEAKER Roger. The swimmers again are closing the hatch.

PAO Recovery swimmers are moving around (garble) the hatch helicopter moving in now.

SPEAKER And Recovery (garble). The command module.

PAO The ship reports that the wind is very light in the recovery area, makes it more difficult for the helicopters to hover. They prefer to have just a little bit more wind.

SPEAKER The C (garble)

SC (garble)

SPEAKER The first astronaut is in the helicopter.

SPEAKER (garble) the command module. The swimmer has the recovery (garble).

PAO The Okinawa reports, the first crewman into the helicopter is the commander, Dave Scott.

SPEAKER (garble)

SPEAKER (garble) The Astronaut is approaching the helicopter.

SPEAKER (garble) The second Astronaut is in the helicopter.

PAO The second astronaut in the helicopter was Jim Irwin.

SPEAKER The Recovery is headed (garble).

END OF TAPE

RECOVERY The Recovery net is now in the (garble) platform. The third astronaut is getting into the net. They are now set for hoisting. He has cleared the Command Module in the water. The third astronaut is on his way up to the recovery helicopter.

PAO Al Worden now on his way up to the helicopter.

RECOVERY (garble) the third astronaut is in the helicopter. (garble)

RECOVERY Astronaut Alfred Worden is in the aircraft (garble).

RECOVERY Okinawa this is Recovery (garble).

OKINAWA Okinawa, Rober.

RECOVERY Okinawa, Swim 2 is on (garble).

RECOVERY Okinawa (garble).

RECOVERY Okinawa tower (garble).

PHOTO Photo to Okinawa tower (garble).

OKINAWA Roger this is Okinawa Tower.

PHOTO Photo, roger.

PAO Cigars now being passed out in the control center.

OKINAWA (garble) Roger, Photo.

OKINAWA Roger, Photo. Your winds are calm (garble).

PHOTO Photo, Roger.

OKINAWA (garble)

PAO The cigars are poised but not yet lit. They won't be lit until the crew is safely on deck. And the American flags are being broken out in the Control Center now. Each of the controllers with a small American flag.

RECOVERY Okinawa, this is (garble)

RECOVERY Okinawa (garble).

OKINAWA Recovery (garble) about 8 knots.

OKINAWA Recovery, this is - -

PAO And the flight controllers are readying a plaque of the Apollo 15 crew patch which will be hung on the wall of the Control Center right after the crew touches down on the carrier. To join the crew patches of all the other Gemini and Apollo missions.

END OF TAPE.

(Air Force hymn)

CAPT Huff Colonel Scott, Colonel Irwin, Major Worden, it is indeed a pleasure to welcome you back from your historic mission. We were here to see you depart with your TLI burn, and it's even a greater pleasure to be here today. Chaplin Peters would you ask an invocation please.

CHAPLIN May we pray. Our Father we are grateful for the success of this mission, for the work accomplished by Astronaut Scott, Irwin and Worden. As we learn of your universe, may we also learn of your purpose for mankind to live in peace. Amen.

HAYWARD Well gentlemen, what can we say on the recovery force, but how great it is to have these 3 magnificent astronauts back here on the primary recovery ship. We had an exciting moment there, and it turned out just great. To these 3 astronauts, I say, as the commander of the recovery forces, that it's a great privilege for me to represent all of them in saying to them, how proud we are, and how great an accomplishment we think they have pulled off here, and how professionally they have executed this lunar mission from Canaveral to the moon and back here in the Pacific, back to USS Okinawa. Fellows, there's no group anyplace that has more pride in what you've done than this recovery force, and I say that not just as recovery force people, but as Americans we are mighty proud of you. We have here today, to represent the US Air Force, and I must say, to all of us, who are pretty well aware that this Apollo 15 crew is an all Air Force contingent, and we're honored to have with us, 2 of the Air Forces finest General officers, Brigadier General, Pete Everest, who commands the aerospace rescue and recovery forces, and also General Clay (inaudible) General.

CLAY Colonel Scott, Major Worden, and Colonel Irwin, certainly, I'd want to offer my congratulations and welcome you home. I think particularly also, you well realize the tremendous pride our nation takes in your accomplishment. And I would be somewhat less than truthful if I didn't state also, there's a peculiar glow that the Air Force feels as a result of your mission. More importantly, however, it seems to me that this mission represents - the successful mission, Apollo 15 represents a culmination of a superb team effort on part of so many elements of our national life, the executive department, the congress, scientists, and engineers, and I'm sure they all share with you the pride in the accomplishment. It's a pleasure for me to say it's a tremendous thrill for me to be here to

CLAY extend my congratulations. It's certainly been a wonderful and historic mission, and I can't help but also complement you on your superb selection of music. Thank you, Colonel Scott.

SCOTT Thank you General Clay, and thank you, crew of the Okinawi. The crew of the Endeavour is glad to be aboard. We appreciate the fine pick up, and it's been my experience, the Navy always makes a fine pick up, whether we land 6 miles from the carrier, or 6,000. They're always there right on the spot, and we certainly appreciate it. It's great to be back. We had a great time on the trip. I think we accomplished a lot. We had a lot of support from a lot of people, and I'd just like to say that we appreciate every bit of it, and we could not have done the mission, we couldn't have gone 1 step without the support of the many many thousands of people involved. Thank you very much.

WORDEN Not that I'm shakey, it's just that I don't have my sea legs yet, you lucky stiff, you've been out here for a while. We just finished, probably the most fantastic 12 days I've ever had in my life, and I guess only one thing surpasses the excitement, and the intense feeling I had on the flight, and that was sort of the feeling I had when I saw you all today. It sure is nice to be back, and it sure is good to see you all. Thanks a bunch for the pick up.

IRWIN This is a very proud moment for me. It's proud to be part of this great team that could send us to the moon and bring us back. The recovery was just, just excellent. Of course, I feel very happy to be aboard a more sea worthy craft than we just got off of. Also, I'd like to say, that I hope all of you, all around the world enjoyed our voyage to the moon as much as we did, on the flight, thank you all.

MUSIC (Anchors Away)

PAO This is Apollo Control. The first of 2 post recovery news conferences will begin in the MSC auditorium in approximately 30 minutes. Participants will be Doctor George Low, NASA Deputy Administrator, Dale D Meyers, Associate Administrator for Manned Space Flight, Doctor Rocco Petrone, Apollo Program Director, Doctor Chris Kraft, Deputy Director of Manned Spacecraft center, and Doctor Eberhard F Rees, Director of the Marshal Space Flight center. This news conference will last no longer than 25 minutes. Immediately following the conclusion of the first news conference, there will be a second conference, participants in this number 2 conference, Chester Lee, Mission Director, Sigarday Sjoberg, Director of Flight Operations

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PAO Manned Spacecraft Center, James A
McDivitt, Apollo Spacecraft Program Manager, Donald K. Slayton,
Director of Flight Crew Operations, Gerald Griffin, the
Flight Director, Doctor Charles Berry, Director of Medical
Research and Operations, Osro Covington, Director of
Networks for Goddard Spaceflight Center, and Major General
David M. Jones, the Department of Defense Manager for
Manned Spaceflight support operations. We are securing
this line now.

END OF TAPE