

419 pp.

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pp. 98, 132, 136

MSC-04559



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

APOLLO 15 COMMAND MODULE ONBOARD VOICE TRANSCRIPTION

(U)

Classification changed to U
By authority of JSC Security Class. Officer
Date 11/9/73 - 2/10/78. Lacey [Signature]

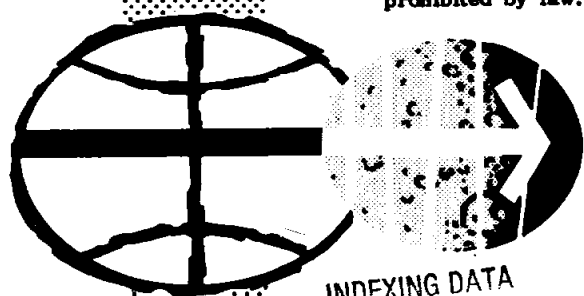
**RECORDED ON THE
DATA STORAGE EQUIPMENT
(DSE)**

AUGUST 1971

GROUP 4
Downgraded at 3-year
intervals; declassified
after 12 years

CLASSIFIED DOCUMENT - TITLE UNCLASSIFIED

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**MANNED SPACECRAFT CENTER
HOUSTON, TEXAS**

INDEXING DATA

DATE 08-00-71 OPR MSC # MSC-04559 T R PGM APD SUBJECT (U) SIGNATOR MSC LOC 007 64

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SECURITY CLASSIFICATION

The material contained herein has been transcribed into a working paper in order to facilitate review by interested MSC elements. This document, or portions thereof, may be declassified subject to the following guidelines:

Portions of this document will be classified CONFIDENTIAL, Group 4, to the extent that they:

- (1) define quantitative performance characteristics of the Apollo Spacecraft,
- (2) detail critical performance characteristics of Apollo crew systems and equipment,
- (3) provide technical details of significant launch vehicle malfunctions in actual flight or reveal actual launch trajectory data,
- (4) reveal medical data on flight crew members which can be considered privileged data, or
- (5) reveal other data which can be individually determined to require classification under the authority of the Apollo Program Security Classification Guide, SCG-11, Rev. 1, 1/1/66.

INTRODUCTION

This document is the transcription of the Apollo 15 flight crew communications as recorded on the command module (CM) data storage equipment (DSE) and subsequently transmitted (dumped) to Manned Space Flight Network stations. Magnetic tapes containing dumped voice and onboard-recorded ground elapsed time (GET) were forwarded to the NASA Manned Spacecraft Center, Houston, Texas. Transcription of these tapes was managed by David M. Goldenbaum, Test Division, Apollo Spacecraft Program Office, to whom inquiries regarding this document should be referred.

The transcript is divided into three columns — time, speaker, and text. The time column consists of four two-digit pairs representing days, hours, minutes, and seconds (e.g., 04 22 34 14). The speaker column indicates the source of a transmission; the text column contains the verbatim transcript of the communications.

The time used by Mission Control Center (MCC) and indicated as GET in the flight plan may be updated to both the spacecraft and MCC computers but will not be updated to the telemetry downlink pulse-code-modulated bitstream or other time-recording devices. This GET updating will be performed only to correct significant changes in flight-plan time occurring as the result of delayed lift-off, midcourse corrections, or spacecraft burn-time differences (trajectory dispersions).

Should these updates occur, the Apollo elapsed time (the true mission-elapsed time) may not agree with flight-plan and MCC times. Users of this transcript are cautioned to apply the appropriate time-update deltas for the updated periods.

Speakers in the transcript are identified as follows:

Spacecraft:

CDR	Commander	David (Dave) R. Scott
CMP	Command module pilot	Alfred (Al) M. Worden
LMP	Lunar module pilot	James (Jim) B. Irwin
SC	Unidentifiable crewmember	
MS	Multiple speakers	

UNCLASSIFIED

Mission Control Centers:

CC Capsule communicator (CAP COMM)

LCC Launch control center

In the text, a series of three dots (...) is used to designate those portions of the communications that could not be transcribed because of garbling. One dash (-) is used to indicate a speaker's pause or a self-interruption. Two dashes (- -) are used to indicate an interruption by another speaker or a point at which a recording was abruptly terminated. Words given unusual emphasis by the speaker are underlined.

The Apollo 15 mission was flown July 26 to August 7, 1971; lift-off occurred at 13:34:00.79 G.m.t. (9:34:00.79 a.m. e.d.t.) on July 26. The CM was designated Endeavour and the lunar module was called Falcon.

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DAY 1

Day	Hour	Min	Sec		
-00	00	00	10	LCC	10, 9, 8, 7, 6, 5 -
-00	00	00	04	LCC	IGNITION, 3, 2, 1 -
00	00	00	01	LCC	LIFT-OFF!
00	00	00	02	CDR	And the clock is running.
00	00	00	04	CMP	Okay. ... lift-off ...
00	00	00	12	CC	Clear the tower!
00	00	00	13	CDR	Roger dede [sic]. Clear the tower, and we have a roll program. ...
00	00	00	18	CC	You have good thrust on all five engines.
00	00	00	21	CDR	Thanks, Gordo. Roll's complete. And we have a pitch program.
00	00	00	29	CC	Pitch.
00	00	00	39	CC	Stand by for Mode I Bravo.
00	00	00	42	CC	MARK. I Bravo.
00	00	00	44	CDR	Roger. I Bravo.
00	00	00	45	CMP	PROPELLANT DUMP, RCS COMMAND, Dave.
00	00	00	46	CDR	Okay.
00	00	00	54	CDR	Okay. Going through the air. (Laughter)
00	00	00	55	CC	... 15 ...
00	00	00	56	CMP	Cabin pressure decreasing.
00	00	00	57	CDR	Okay. Good.
00	00	00	58	LMP	Looks good over here.
00	00	01	00	CMP	High at 20,000.
00	00	01	01	LMP	Dead

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00 00 01 02 CMP One minute.

00 00 01 03 LMP Here ...

00 00 01 04 CC ..., Houston. Everything looks perfect down here.

00 00 01 06 CDR Okay. Looks smooth up here, Gordo. Okay, the altimeter is six zero.

00 00 01 12 CMP Well, how about that?

00 00 01 28 LMP Exciting!

00 00 01 30 CDR Okay. We're through MAX q.

00 00 01 34 CMP Okay. 1:32. Program looks good, Dave. Out at 11 miles.

00 00 01 40 CDR Okay. Good shot. Two and 1/2g.

00 00 01 44 LMP Roger.

00 00 01 47 CDR Pitch profile looks good.

00 00 01 50 LMP Roger.

00 00 01 52 CMP 1:50.

00 00 01 55 CC Stand by for Mode I Charlie.

00 00 01 58 CC MARK. I Charlie, now.

00 00 02 00 CDR Roger. I Charlie.

00 00 02 02 CMP EDS AUTO to OFF.

00 00 02 06 CDR Okay, we're at 3g's. Stand by for inboard.

00 00 02 14 CMP Okay. The program's looking good.

00 00 02 18 CDR Inboard.

00 00 02 19 CC ... Inboard.

00 00 02 30 LMP A little high hum, there.

00 00 02 31 CMP Yes.

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00 00 02 32 CDR Okay, 10 seconds to staging. Hang on.

00 00 02 34 CMP Okay.

00 00 02 36 CDR Five seconds.

00 00 02 43 CMP Man, you aren't kidding.

00 00 02 44 IMP Boy.

00 00 02 48 CDR Good stage.

00 00 02 49 CC ...

00 00 02 56 CC ... Houston. You have good thrust on the S-II. All five are good.

00 00 02 59 CDR Okay.

00 00 03 00 CMP Okay, Dave. You got TFF 3:26.

00 00 03 02 CDR Good show. We'll go on time.

00 00 03 12 CMP Second plane SEP.

00 00 03 15 CC ...

00 00 03 17 CDR Good show.

00 00 03 18 CMP Tower JETT.

00 00 03 19 CC We confirm the skirt SEP. You're Mode II.

00 00 03 22 CDR Roger. Mode II. Guidance initiate.

00 00 03 29 CC ...

00 00 03 37 CDR How we doing, Al?

00 00 03 38 CMP We're doing fine; 63 miles.

00 00 03 41 CDR Good.

00 00 03 48 IMP Everything looks good over here.

00 00 03 50 CDR Okay.

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[REDACTED]

00 00 03 51 CMP Just - looks just about a hundred feet per second down on the H-dot, but everything else looks fine.

00 00 03 56 CDR Okay, I got the big fireball going by at staging. I don't know whether you saw it or not. That beauty really goes.

00 00 03 59 CMP Yes - -

00 00 04 01 CC ..., Houston. At 4, the guidance has converged, the CMC is GO, and everything looks good.

00 00 04 07 CDR Okay, Gordo. Looks good up here.

00 00 04 09 LMP Man, I got the Moon in my window.

00 00 04 11 CMP Yes, sir. It's out there.

00 00 04 19 CDR Thrusters are stable; the ball's stable.

00 00 04 23 CMP We're at a V_I of 11,000 and right on the money.

00 00 04 27 CDR Good show. Let me check here at 4:30 just to make sure.

00 00 04 36 CMP That sucker's right on - right on.

00 00 04 45 CMP Little high on altitude. I bet you they're going to give you the ... here in a minute.

00 00 04 53 CDR I hope so by now.

00 00 04 59 CC ..., Houston. Five minutes. Everything looks nominal. You're GO.

00 00 05 03 CDR Okay, Gordo; thank you. Looks good up here. Got a smooth ride so far.

00 00 05 10 CC ...

00 00 05 12 CMP Yes siree, looks good.

00 00 05 20 CDR See, we're getting just a little teeny bounce. You feel it now?

00 00 05 23 CMP Uh-huh.

00 00 05 24 LMP Every once in a while?

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00 00 05 25 CMP Yes.

00 00 05 30 CDR Very low amplitude.

00 00 05 41 CDR Okay, be watching for the S-IVB for COI.

00 00 05 44 LMP Okay.

00 00 05 45 CC ..., Houston. Times are nominal. The level sense arm will be 8 plus 34, and S-II cut-off at 9 plus 09. Over.

00 00 05 53 CDR Roger; 8 plus 34 and 9 plus 09.

00 00 05 57 CDR Okay, Jimmy; gimbal motors.

00 00 05 58 CC Stand by for S-IVB to COI.

00 00 06 00 CC MARK. You have S -

00 00 06 02 CDR Roger. S-IVB to COI. Jim?

00 00 06 04 LMP Ready. 1, 2, 3, 4.

00 00 06 11 CMP On and trimmed.

00 00 06 22 CDR Okay, we're right - right down the line.

00 00 06 26 LMP Okay.

00 00 06 27 CMP Coming up on 15,000 V_I , 260 H-dot. That's right where we ought to be, and that gives us an SCS COI.

00 00 06 32 CDR Okay. Keep your eye up for S-IVB to orbit.

00 00 06 38 CMP Yes.

00 00 06 43 CC Stand by for S-IVB to orbit capability.

00 00 06 47 CC MARK. You have it now.

00 00 06 49 CDR Roger; S-IVB to orbit.

00 00 07 01 CDR How's our cabin pressure, Jim?

00 00 07 03 LMP Holding at 6.

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00 00 07 04 CDR Very good.

00 00 07 18 CMP Feels like we get a little vibration out of that thing.

00 00 07 21 CDR Well, it seems to be pretty steady though.

00 00 07 24 CMP Yes.

00 00 07 25 CDR We're about 1.7g, somewhere around there. Okay, 10 seconds to inboard.

00 00 07 34 CMP V_I 's 18,000. ... We're at 96 miles.

00 00 07 40 CDR Inboard.

00 00 07 41 CC Inboard.

00 00 07 48 CDR Okay, about 10 seconds to PU shift.

00 00 08 03 CMP Didn't even feel it. There it goes, 8:03.

00 00 08 10 CDR A little bit.

00 00 08 11 CMP Yes.

00 00 08 12 CC Houston - 15, Houston. Go ahead.

00 00 16 56 CMP The first LINE HEATER's on.

00 00 16 58 CDR Okay. Have you got the torquing angle?

00 00 17 02 CMP Mm-hum. Okay, we could do the SM RCS monitoring check and the CM - -

00 00 17 06 CC 15, Houston through Canaries. Over.

00 00 17 10 CDR Go ahead, Houston; 15. What's your - -

00 00 17 12 CC You're loud and clear.

00 00 17 14 CDR The S-IVB tank pressure ... above ...

00 00 17 42 IMP I know we're over the ... but ... Indian Ocean should be.

00 00 17 45 CMP Okay.

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00 00 17 46 CDR And it looks like the S-IVB is tracking very nicely.
00 00 17 51 CMP ... we were going so fast.
00 00 17 53 CDR Huh?
00 00 17 54 CMP I - I guess I hadn't really - hadn't - myself
thought we wouldn't be - it wouldn't be visibly
this fast.
00 00 18 05 CDR Oh - -
00 00 21 23 CDR Okay. Carnarvon at 52.
00 00 21 38 CMP Okay. I'm going to do a fuel cell purge check here,
Dave.
00 00 21 41 CDR Okay. Al, we'll put a - -
00 00 21 45 LMP Go ahead.
00 00 21 46 CMP Huh?
00 00 21 47 CDR Do you want to get - get going down there?
00 00 21 49 CMP Yes.
00 00 21 50 CDR Go slow.
00 00 21 51 CMP Yes.
00 00 21 57 CDR Try and clean some of this stuff off, too.
00 00 22 02 CMP Ah, oh, eat it!
00 00 22 10 CDR You can take mine and stick it in there, too.
00 00 22 12 CMP Yes.
00 00 22 13 LMP With that indicator out, I can't confirm an H₂ purge
on fuel cell 2.
00 00 22 19 CDR Really?
00 00 22 20 CMP Can't you get the - get the H₂ -
00 00 22 26 CDR Caution and warning tone?
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[REDACTED]

00 00 22 27 CMP No, we don't get it.

00 00 22 29 CMP Hm.

00 00 22 30 CDR Hm. Better discuss that with them next time we - -

00 00 22 32 LMP Yes.

00 00 22 34 CDR - - go by.

00 00 22 53 CDR Well, shall we gently step along?

00 00 22 55 CMP Yes.

00 00 22 56 CMP Yes. Do you want R-12 out now, Jim? Anything Flight-Data-File-wise that you need now?

00 00 23 04 LMP I don't need anything, Al.

00 00 23 06 CMP Okay. I'm just going to stick these cards here in the compartment then, and - -

00 00 23 18 LMP Okay, Dave. Do you want to swing over and get the SM RCS monitoring check? Or do you want me to get that?

00 00 23 23 CDR Oh, I can get it.

00 00 23 24 LMP Here. I can just read it to you.

00 00 23 27 CDR Shoot.

00 00 23 28 LMP SM RCS PROPELLANT talkback, eight, gray.

00 00 23 30 CDR Eight, gray.

00 00 23 31 LMP RCS HELIUM 1 and 2 - -

00 00 23 32 CDR Whoops, stand by; we got one - one barber pole right down - we got B PROPELLANT - barber pole. That was probably a mistake. We open it, and it's gray.

00 00 23 46 LMP You want to make a note?

00 00 23 48 CDR Yes.

00 00 23 49 LMP B PROPELLANT - -

[REDACTED]

00 00 23 50 CDR B SECONDARY PROPELLANT - B SEC PROPELLANT was
barber pole, and it reset to gray.

00 00 23 58 LMP Okay. Okay. SM RCS INDICATOR, HELIUM TANK TEMP.

00 00 24 05 CDR Okay. HELIUM TANK TEMP.

00 00 24 06 LMP RCS INDICATOR selector to A through D. Give me
PACKAGE TEMP, HELIUM PRESSURE - all four.

00 00 24 15 CDR Okay. Let me get calibrated here. You want - That's
in temperatures only, huh?

00 00 24 21 LMP No, I want TEMP, PRESSURE, ... PRESSURE, and HELIUM
TANK TEMP.

00 00 24 26 CDR Okay. 140, 4000, 200, 71.

00 00 24 32 LMP Good.

00 00 24 34 CDR 150, 4000, 195, 70.

00 00 24 39 LMP Good.

00 00 24 41 CDR 140, 4200, 195, 74.

00 00 24 46 LMP Good. D.

00 00 24 48 CDR D is 150, 4000, 190, and 72.

00 00 24 55 LMP Okay, your MANIFOLD PRESSURE's 2 low.

00 00 24 59 CDR Say again?

00 00 25 00 LMP The MANIFOLD PRESSURE on D is a little low, about 2.

00 00 25 03 CDR Oh.

00 00 25 04 LMP Its lower - lower limit is, accord - 192.

00 00 25 08 CDR Oh, okay, I'll give you one - Well, shoot, ... - -

00 00 25 10 LMP You can't read it. Okay. CM RCS monitoring check.

00 00 25 12 CDR Okay.

00 00 25 13 LMP CM RCS PROPELLANT talkback, two, gray.

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Day 1

00 00 25 15 CDR Two, gray.

00 00 25 16 LMP RCS INDICATOR, switch to CM 1 and 2.

00 00 25 20 CDR Okay. CM 1 - I'm waiting - Okay, you want - -

00 00 25 23 LMP HELIUM TEMP, PRESSURE, and MANIFOLD PRESSURE.

00 00 25 26 CDR Okay. HELIUM TEMP's about 70 - -

00 00 25 31 LMP Good.

00 00 25 32 CDR - - 4000, and 95.

00 00 25 37 LMP Okay, HELIUM should be 4100 to 4200.

00 00 25 39 CDR Okay, it's right on 4000.

00 00 25 41 LMP Okay. Okay. For 2?

00 00 25 45 CDR Two; I'm looking at 70, 4000, and about 90.

00 00 25 52 LMP Okay. Okay. I'm going to do a caution and warning operational check here.

00 00 25 59 CDR Okay.

00 00 26 06 LMP We're going to get a MASTER ALARM here.

00 00 26 16 CDR Okay, let me check.

00 00 26 18 LMP Okay, you're down in the LEB, Al?

00 00 26 20 CMP Yes.

00 00 26 21 CDR Get those - -

00 00 26 22 LMP Okay, can you get the strut unlocked while you're getting those?

00 00 26 23 CDR I'm getting them right - I'm getting them right now.

00 00 26 25 LMP Okay.

00 00 26 40 CMP That was a fantastic ride!

00 00 26 42 MS (Laughter)

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00 00 26 45 CMP I'm just now beginning to understand what went on.

00 00 26 47 LMP Yes, boy.

00 00 26 49 CMP That S-IC really does shake!

00 00 26 52 CDR Yes.

00 00 26 54 LMP Are you still working on that, Al?

00 00 26 56 CMP Got the lanyard low - stowed.

00 00 26 58 LMP Okay. DRINKING WATER SUPPLY valve, ON.

00 00 27 00 CMP Okay. See if I can get to it here.

00 00 27 04 CDR Quit having a good time and go to work (laughter).

00 00 27 13 CMP Okay, it's ON.

00 00 27 15 LMP Okay. CB: COAS/TUNNEL LIGHTING, MAIN B, closed.

00 00 27 18 CMP Get your big foot out of the way.

00 00 27 21 CDR Push me down.

00 00 27 22 CMP I did. Okay. It's closed.

00 00 27 24 LMP Okay. Unstow helmet bags, accessory bags, and tool E.

00 00 27 27 CMP Okay. David, the helmet bags - Let's see, they're behind you, aren't they?

00 00 27 31 CDR Yes, they're - I got to get those stupid things.

00 00 27 33 CMP They're in U-4 - or U-1. Tool E is in L-2.

00 00 27 38 CDR Yes. I'll get it. I don't know what this little thing is here, ...

00 00 27 47 LMP Okay, I'm going to switch around and get that window cover.

00 00 27 51 CDR Okay. Let's see, where the heck is tool E? ... Here it is.

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Day 1

00 00 28 06 LMP (Laughter) I didn't see the - the decal on the light over here.

00 00 28 10 CMP On the light?

00 00 28 11 LMP Yes. "This vehicle will not be placed in motion until all seat belts are properly fastened. By order of the Chief of Staff, USAF."

00 00 28 16 CDR Oh, you didn't see that? (Laughter)

00 00 28 17 LMP No.

00 00 28 29 LMP It would sure be easy to knock some switches here.

00 00 28 31 CMP Yes. It sure would be. Okay, that's a thing we got to watch pretty close, huh?

00 00 28 35 CDR Yes.

00 00 28 36 LMP I - I might get you to get that window shade, Al, if - if you have a chance.

00 00 28 42 CMP Oh, it's in the - -

00 00 28 43 LMP I know where it is - it's just hard for me to get over to one of them - ... below it - -

00 00 28 46 CMP I'll get it. Yes.

00 00 28 47 CDR Is it in with the other window shade?

00 00 28 48 LMP Yes.

00 00 28 49 CMP Yes.

00 00 28 50 CDR I can get it, it's right in here.

00 00 28 51 LMP We want to put that in here so we don't get sunburned.

00 00 28 52 CDR Good boy.

00 00 28 56 LMP Give us the Lexan.

00 00 28 57 CMP/CDR Yes.

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[REDACTED]

00 00 28 58 CDR ... Okay, there's tool E.

00 00 29 02 CMP Now, let's see. You want to do that EMERGENCY CABIN PRESSURE thing?

00 00 29 08 LMP Yes, let me - I've got a - I'm confirming normal suit and cabin pressure.

00 00 29 12 CMP Okay.

00 00 29 13 CDR Here's your Lexan, Jim.

00 00 29 15 LMP Okay.

00 00 29 16 CDR Got it?

00 00 29 17 CMP Be very careful of that Lexan, because I - I'm going to need to take some pictures through it.

00 00 29 21 LMP Yes, okay.

00 00 29 25 CDR Make sure you get everything tied down when you get through using it, because we got one more little g-level thing to go through here.

00 00 29 32 CMP Yes, right.

00 00 29 46 CDR Okay. Helmets and access - helmet bags and accessory bags.

00 00 29 50 CMP Right here.

00 00 29 55 LMP Okay. The Lexan shade is on.

00 00 29 57 CMP And grab the TSBs while you're there, too. Dave.

00 00 30 01 CDR Okay.

00 00 30 02 CMP Okay, Jim. I guess we could do the - -

00 00 30 06 CDR Where are the TSBs, Al? They're not up here. They're down in one of those other things.

00 00 30 19 MS ...

00 00 30 22 CMP Must be in U-1.

[REDACTED]

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00 00 30 23 CDR Really?

00 00 30 24 CMP Yes.

00 00 30 27 CDR In U-1 - I was looking in U-2?

00 00 30 30 CMP Oh, okay.

00 00 30 32 LMP Let's see. The O₂ FLOW is high.

00 00 30 34 CMP What's the cabin pressure - -

00 00 30 35 LMP Oh, it - it just dropped down.

00 00 30 36 CDR Yes. Okay.

00 00 30 37 CMP What's - what's the cabin pressure? We still got the waste stowage vent - -

00 00 30 38 LMP Yes. It's ...

00 00 30 39 CDR It's 6.

00 00 30 40 LMP Well, it was just high for a little bit.

00 00 30 41 CMP Yes.

00 00 30 42 LMP Okay. CABIN PRESSURE - EMERGENCY CABIN PRESSURE valve to BOTH, Al.

00 00 30 48 CMP Okay. EMERGENCY CABIN PRESSURE going to BOTH.

00 00 30 50 LMP And SUIT CIRCUIT RETURN VALVE, open, Dave.

00 00 30 55 CDR Yes, sir. It's open.

00 00 31 00 LMP Okay. We can - I got the window cover on. We can remove helmet and gloves and stow in PGA bag.

00 00 31 05 CDR Don't we - don't we do a check first?

00 00 31 08 LMP No, we don't. That MAIN REG check's on the next page.

00 00 31 11 CDR Well - -

00 00 31 12 LMP As long as you're in position though, Al, let's do it.

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00 00 31 13 CMP Yes.

00 00 31 14 CDR Let's do it.

00 00 31 15 LMP Okay. MAIN REG B valve, closed.

00 00 31 17 CMP MAIN REG B, closed.

00 00 31 18 LMP EMERGENCY CABIN PRESSURE, select to 1.

00 00 31 20 CMP 1.

00 00 31 21 LMP PUSH TO TEST pushbutton, push for O₂ FLOW increase.

00 00 31 23 CMP Okay.

00 00 31 30 CMP Don't see anything.

00 00 31 31 LMP There it goes - -

00 00 31 32 CDR Okay. There it goes.

00 00 31 33 CMP Okay.

00 00 31 34 LMP Okay. MAIN REG B valve, OPEN.

00 00 31 35 CMP OPEN.

00 00 31 36 LMP MAIN REG A valve, closed.

00 00 31 37 CMP Closed.

00 00 31 38 LMP EMERGENCY CABIN PRESSURE, select to 2.

00 00 31 40 CMP To 2.

00 00 31 41 LMP PUSH TO TEST pushbutton, push for O₂ FLOW increase.

00 00 31 44 CMP Okay. Pushing. I got it.

00 00 31 47 LMP Okay, MAIN REG A valve, OPEN.

00 00 31 49 CMP OPEN.

00 00 31 50 LMP EMERGENCY CABIN PRESSURE, select to BOTH.

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C

00 00 31 52 CMP BOTH.

00 00 31 53 LMP Okay. That's complete.

00 00 31 55 CDR Okay.

00 00 31 56 LMP So, we - you want to take off helmets and gloves now?

00 00 31 58 CDR Yes.

00 00 31 59 CMP ..., yes.

00 00 32 01 CDR Cabin pressure look good?

00 00 32 02 LMP Yes.

00 00 32 03 CDR Okay. Let's get into our little home. Shall we do it?

00 00 32 23 CMP The accessory bags inside here, Dave?

00 00 32 25 CDR Yes.

00 00 32 26 CMP Let's see, you're C.

00 00 32 27 CDR Okay, thank you.

00 00 32 28 CMP And let's see what kind of label you got on yours today. Jim, you got an R - for you today.

00 00 32 36 LMP R, okay.

00 00 32 40 CDR R, C, and L. Guess we can keep track of that.

00 00 32 52 LMP It's so pretty out here, Dave, I'd almost settle for an Earth-orbit mission.

00 00 32 56 CDR Don't you say that.

00 00 32 57 CMP (Laughter)

00 00 33 00 CDR Well, you'll get one, maybe someday. Who knows?

00 00 33 18 CMP Boy. Sure doesn't take much to scratch these helmets.

00 00 33 23 CDR No. Sure doesn't.

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00 00 33 30 CMP Oh, it's quiet.

00 00 33 32 LMP Sure is.

00 00 33 34 CMP Let's see, what have we got going, just the suit fans?

00 00 34 09 LMP It's so quiet, it's kind of eerie -

00 00 34 11 CMP Yes.

00 00 34 12 LMP Almost like a space flight.

00 00 34 18 CMP (Singing)

00 00 34 19 CDR Okay. We got to snap these things ...

00 00 34 24 CMP Yes. We're supposed to try to keep them up there where we can get them ...

00 00 34 29 CDR You give me a hand here, will you?

00 00 34 30 CMP Yes, we'll give you one.

00 00 34 32 LMP ... onboard ...

00 00 34 40 CDR ... convenient place ...

00 00 34 45 CMP Yes.

00 00 34 47 LMP ...

00 00 34 53 CMP ...

00 00 35 08 LMP You want to ... them all?

00 00 35 10 CDR I guess - -

00 00 35 11 CMP ... all ... put them up.

00 00 35 20 CMP I'll never do this again.

00 00 35 28 CDR I'll bet you would (laughter).

00 00 35 30 CMP Oh, what a joy! (Laughter) Oh, what a joy!

00 00 35 34 CDR You don't ... to mind it.

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00 00 35 35 CMP What a joy! Too much ...

00 00 35 40 CDR Let's see. If you're going to do that, hand me the checklist - -

00 00 35 42 CMP Okay. What do we - what do we need, Dave? Why don't you read it out to me now? ...

00 00 35 47 CDR DAC.

00 00 35 48 CMP Got magazine Able.

00 00 35 50 CDR Able. Okay.

00 00 35 51 CMP Okay, which lens?

00 00 35 52 CDR Power cable, 18-millimeter lens.

00 00 35 54 CMP 18-millimeter lens. Okay, 18 lens.

00 00 36 09 CDR Right-angle mirror.

00 00 36 10 CMP Right-angle mirror.

00 00 36 12 CDR Assemble and mount in the left-hand window ...

00 00 36 16 CMP Left hand ... Okay, ... need to get out of here ...

00 00 36 29 CDR Here's the mirror.

00 00 36 31 CMP ... the power cable.

00 00 36 39 LMP Okay, Dave, when you get a chance, you want to monitor SECONDARY ACCUMULATOR QUANTITY.

00 00 36 45 CMP Now - do you want to get the Hasselblad out?

00 00 36 49 CDR Oh, yes. Yes, we want - -

00 00 36 51 CMP It's got a MAG.

00 00 36 53 CDR Well, better cross it out. ...

00 00 36 55 CMP MAG M. Oh, it is crossed out?

00 00 37 00 CDR ... EL. Oh, okay. Spotmeter. Stow in the LMP TSB. I guess you better get the TSBs out ... - -

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[REDACTED]

00 00 37 08 CMP Yes.

00 00 37 10 CDR And the TSBs are up behind Jim.

00 00 37 12 CMP Yes. Yes. They're behind you, Jim.

00 00 37 15 LMP What, the TSBs?

00 00 37 16 CMP Yes.

00 00 37 17 LMP Up over here?

00 00 37 22 CMP Guess that's all we need out of here for now. ...

00 00 38 04 LMP Boy, you really get a Coriolis effect by looking at that ... in here.

00 00 38 08 CDR Yes; that's why I say, just go slow, because it will all go away here in a few hours. Won't even notice it. ... - -

00 00 38 14 LMP ... always felt we'd parted some company, didn't you?

00 00 38 17 CMP Yes.

00 00 38 18 CDR No, but it's nice to just go slow.

00 00 38 20 CMP Yes. Oh, yes, it's - -

00 00 38 21 LMP Are you ready for some TSBs?

00 00 38 23 CMP Yes, you need yours most of all.

00 00 38 25 LMP I - I need mine?

00 00 38 26 CMP Yes, because you need to put these two cameras in it.

00 00 38 29 LMP Okay.

00 00 38 43 LMP Okay. You want to hand me the camera, Al?

00 00 38 46 CMP Okay, Jim, that's the - Yes, here you go.

00 00 38 49 LMP Is that for my UV work?

00 00 38 51 CMP Your EL with magazine M in it.

00 00 38 54 LMP For the UV?

[REDACTED]

~~CONFIDENTIAL~~

00 00 38 55 CMP Yes. Okay. And here's your spotmeter.

00 00 39 00 LMP Spotmeter go in here, too?

00 00 39 02 CMP Yes. Got it? Okay. I'll get the TV camera out.

00 00 39 36 LMP Okay, I'm going to do the - Dave, are you ready for that leak - -

00 00 39 39 CDR Yes.

00 00 39 40 LMP - - that secondary RAD leak check?

00 00 39 41 CDR Yes, sir.

00 00 39 42 LMP Okay. If you'll - put the SECONDARY GLYCOL TO RAD valve, NORMAL, for 30 seconds.

00 00 39 48 CDR Have, you got tool E?

00 00 39 50 CMP Yes. Yes, it's right up in front of you there, Dave.

00 00 39 53 CDR Oh, thank you. Jimmy? Can you reach here?

00 00 39 57 LMP No. And it's starting to get dark.

00 00 40 02 CDR Really? I've got to get going on the P52.

00 00 40 05 CMP Yes.

00 00 40 08 CDR Okay. I can't get that, Jim, until Al closes the door there.

00 00 40 11 CMP Yes; okay.

00 00 40 13 LMP I'll do this ECS Postinsertion Configuration.

00 00 40 16 CDR Okay.

00 00 40 17 LMP Okay. GLYCOL RESERVOIR BYPASS valve to OPEN.

00 00 40 20 CDR Okay, OPEN.

00 00 40 21 LMP GLYCOL RESERVOIR OUT valve, CLOSE.

00 00 40 23 CDR CLOSED.

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00 00 40 24 LMP GLYCOL RESERVOIR IN valve, CLOSED.

00 00 40 25 CDR CLOSED.

00 00 40 26 LMP And the PRIM quantity, let me check it - 25 to 50 at - It's good.

00 00 40 34 CDR Okay.

00 00 40 35 LMP Al, let's - Can you reach the PRIM ACCUMULATOR FILL valve?

00 00 40 38 CMP Yes.

00 00 40 39 LMP Okay, put it ON.

00 00 40 47 CMP Here, Jim, can you reach the cable? ...

00 00 40 51 LMP Yes. I've got it now.

00 00 40 52 CMP Okay.

00 00 40 57 LMP You working on that one, Dave?

00 00 40 59 CDR Sure am.

00 00 41 02 CMP Can you get to it there, Dave?

00 00 41 06 CDR Haven't yet. No. Can you get to it?

00 00 41 12 CMP Well, what do you need? PRIMARY ACCUM?

00 00 41 15 CDR Yes.

00 00 41 16 CMP Yes, sure. Which way do you want it?

00 00 41 22 CDR Well, it was the PRIMARY ACCUMULATOR FILL valve -

00 00 41 25 CMP PRIMARY ACCUMULATOR FILL; okay.

00 00 41 26 CDR ...

00 00 41 28 LMP Put it ON. I'll tel. when to - put it back - -

00 00 41 34 CMP Turn it ON?

00 00 41 35 LMP Okay - -

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00 00 41 36 CMP It's ON.

00 00 41 37 LMP - - you can turn it back OFF.

00 00 41 38 CMP Okay, it's OFF. Is that all?

00 00 41 40 CDR Yes. Why don't you get the secondary while you're there? Jim, do you have that?

00 00 41 43 LMP Yes. SECONDARY GLYCOL TO RAD valve, NORMAL, A1, if you're in that position. Let me know when you - when you get it in NORMAL.

00 00 41 50 CMP Yes, I can't quite reach that.

00 00 41 51 CDR Okay.

00 00 41 52 MS ...

00 00 41 54 CMP Can you get it there, or - -

00 00 41 55 CDR Yes.

00 00 41 56 CMP If you'll wait a minute, I'll be able to get it.

00 00 41 57 CDR I can get it. Thank you.

00 00 41 58 CMP Okay.

00 00 42 00 LMP Let me know when you get it to NORMAL.

00 00 42 04 CDR Okay, going NORMAL now, Jim.

00 00 42 06 LMP Okay.

00 00 42 07 CDR It's in NORMAL.

00 00 42 15 CMP Okay, Jim. Here are the lines to the TV.

00 00 42 20 LMP Wish I had a place to set that thing.

00 00 42 22 CMP Yes. ...

00 00 42 23 LMP Okay. ... the monitor.

00 00 42 26 CDR Okay. How long you want this thing in NORMAL?

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00 00 42 28 LMP Oh, I'll give you a hack here.

00 00 42 29 CDR Oh.

00 00 42 36 LMP Okay -

00 00 42 37 LMP MARK. It's - SECONDARY, looks okay.

00 00 42 40 CDR Okay, I'm back to BYPASS.

00 00 42 41 LMP Okay.

00 00 42 42 CDR Is that right?

00 00 42 43 LMP Right. BYPASS.

00 00 42 46 CMP Dave, can I hand you the monitor over there?

00 00 42 48 CDR What - Oh, yes - -

00 00 42 50 CMP For the TV.

00 00 42 52 LMP Let me - Let's see, I got ECS RAD FLOW CONTROL to POWER; PRIM GLYCOL TO RAD valve, NORMAL.

00 00 42 58 CDR GLYCOL TO RAD valve, NORMAL.?

00 00 43 05 CMP I got that. ECS RAD FLOW CONTROL, POWER.

00 00 43 08 CDR Oh. Okay, it's NORMAL.

00 00 43 10 LMP Okay. You've got PRIM GLYCOL TO RAD valve, NORMAL - -

00 00 43 13 CDR Okay.

00 00 43 14 LMP - - RAD HEATER going to PRIM 1.

00 00 43 15 CDR Okay.

00 00 43 17 LMP ECS RAD talkback is gray. GLYCOL EVAP TEMP IN going AUTO.

00 00 43 26 CMP Okay, who can give me a checklist so I can do these optics?

00 00 43 28 CDR Here you go.

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[REDACTED]

00 00 43 29 CMP Okay, I - -

00 00 43 30 LMP POTABLE WATER HEATER to MAIN A. Okay. ECS Post-insertion Configuration complete.

00 00 43 36 CDR Okay.

00 00 43 37 CMP ...

00 00 43 38 LMP Give you this monitor, Dave.

00 00 43 41 CDR Okay.

00 00 44 03 CDR What else you got on there, Jim? Oh, the TSBs.

00 00 44 08 LMP Yes, do you want a TSB?

00 00 44 09 CDR Yes.

00 00 44 10 LMP I'll get them out. Do you want to put one up on the - -

00 00 44 14 CDR That'll do. ... - -

00 00 44 15 LMP Down there, Al. You - -

00 00 44 16 CDR ... Okay.

00 00 44 17 LMP Okay. I've got an EPS monitoring check here; secondary glycol loop check, and we've got the cameras out already.

00 00 44 27 CDR Al, you want to check that?

00 00 44 29 LMP I'm going to go through a secondary glycol loop check here.

00 00 44 31 CDR Okay.

00 00 44 41 CDR Hey, Al?

00 00 44 42 CMP Yes.

00 00 44 43 CDR See that little - see that funny little switch they put on here?

00 00 44 46 CMP Oh, really?

[REDACTED]

00 00 44 47 CDR It came off.

00 00 44 48 CMP How about ... - -

00 00 44 49 CDR Well - -

00 00 44 50 CMP I've got a pocket down here.

00 00 44 51 CDR I got a pocket, no sweat, I just don't want to forget it and have it floating around.

00 00 44 54 CMP Yes.

00 00 44 56 LMP SECONDARY GLYCOL PUMP - -

00 00 44 57 CMP Okay. Optics eyepieces are in, G/N OPTICS POWER going on. OPTICS, ZERO OFF, then ZERO. Okay.

00 00 45 22 CMP Okay, that's 15 seconds. The OPTICS ZERO, OFF - MODE, MANUAL. ... Here we go.

00 00 45 51 CMP Hallelujah!

00 00 45 54 CDR Getting stars?

00 00 45 55 CMP Yes, sir!

00 00 45 56 CDR Oh, okay.

00 00 45 59 CMP Whoops. A good mark there.

00 00 46 06 CDR Okay.

00 00 46 07 CMP Who gave you permission to write ... out here? ...

00 00 46 21 CMP Okay. ...

00 00 46 29 CDR Yes. That's true. Oh, dear. ...

00 00 46 35 CMP Okay. Okay, old PICAPAR, let's see what you can do.

00 00 46 47 CMP Okay; 33. Antares. ... Okay. And ...

00 00 47 01 CDR ...

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00 00 47 10 LMP Boy, at night, you might - might as well be in the simulator (laughter).

00 00 47 14 CDR Yes, except for the physiological change.

00 00 47 17 LMP Yes. Okay, the EPS monitoring check is complete, Dave.

00 00 47 25 CDR Okay.

00 00 47 26 LMP Except for the battery relay bus read-out down there in SYSTEMS TEST meter 5-B.

00 00 47 33 CMP You can pick that up.

00 00 47 35 CDR Yes.

00 00 47 40 LMP Yes.

00 00 47 45 CMP Okay. It doesn't look too good ... down in there.

00 00 47 53 LMP EPS monitoring check now.

00 00 47 56 CDR Okay. Did - did you do your fuel cell purge check, or ... - -

00 00 47 59 LMP No, I couldn't do the H₂.

00 00 48 01 CDR Oh.

00 00 48 14 CMP Doublecheck ... Forty-one. Okay, Dabih.

00 00 48 24 CDR Forty-one, right.

00 00 48 45 CMP ... Five in. ...

00 00 48 56 CDR Forty-one is what?

00 00 48 57 CMP Dabih.

00 00 48 58 CDR Dabih. ... okay?

00 00 49 00 CMP Yes. I got it.

00 00 49 30 LMP Okay, EPS monitoring check's complete.

00 00 49 11 CMP Okay. Let's see how we did. (Cleared throat)

~~CONFIDENTIAL~~

00 00 49 15 CDR Well, pretty good.

00 00 49 17 CMP ... all four ...

00 00 49 19 LMP About another 3 minutes for AOS.

00 00 49 23 CDR Okay. I'll tell you what I'd like to do here ... the pass.

00 00 49 27 CMP Do?

00 00 49 28 CDR Check out the RCS real quick.

00 00 49 30 CMP Here's the torquing angles, David.

00 00 49 32 CDR Okay. ...

00 00 49 33 CMP Go back to zero, and I think I have to get the optics back out. Right? Did you stow the optics, Jim?

00 00 49 42 CDR Okay. Here, do you want to torque at 40? What do we torque at rendezvous?

00 00 49 46 CMP Yes, did - did you stow the optics eyepiece, Jim?

00 00 49 50 CDR Should we torque about 50?

00 00 49 51 CMP Yes.

00 00 49 52 CDR Okay. Good deal.

00 00 49 53 CMP Okay. You got the numbers written down?

00 00 49 55 CDR Yes.

00 00 50 02 CMP Very good, Dave.

00 00 50 03 CDR Okay.

00 00 50 04 CMP Very good ...

00 00 50 07 CDR Okay, Al, and you might - Why don't you come up here and let me show you what the jets look like when we fire the ...

[REDACTED]

00 00 50 14 CMP Oh, okay. Yes. Let me - let me check out a quick star here.

00 00 50 17 CDR Well, we got to do - I want to do this before AOS.

00 00 50 23 CMP Okay.

00 00 50 32 CMP Well, let me climb up here. ...

00 00 50 34 CDR Oh, I'm sorry. Okay. It's - it's good.

00 00 50 38 CMP Yes. I ...

00 00 50 40 CDR Yes.

00 00 50 45 CMP Well -

00 00 50 51 CDR Okay. You can probably look out my window.

00 00 50 54 CMP Oh, yes. Very good - -

00 00 50 56 CDR I lost my watch.

00 00 50 57 CMP Jim, you got my - -

00 00 50 58 LMP Yes.

00 00 50 59 CMP - - stopwatch?

00 00 51 00 LMP I'm looking for one.

00 00 51 05 CMP Did you see that?

00 00 51 06 LMP Yes, I saw a flash.

00 00 51 07 CDR Saw a flash? You did? Couldn't hear it - I didn't hear it. Huh, I'll be darned!

00 00 51 16 CMP Could sure see a flash.

00 00 51 17 CDR Yes. Saw a flash, but I didn't hear it. Gosh, I used to hear them all the time. Huh!

00 00 51 26 CMP You know, it's amazing what ... outside that window ...

00 00 51 34 LMP Well, yes - -

[REDACTED]

[REDACTED]
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00 00 51 35 CDR That's because you got your ... lights on in here.
00 00 51 37 CMP Yes.
00 00 51 43 CDR Okay, ... here.
00 00 51 47 LMP Okay, the secondary glycol loop check's complete.
00 00 51 50 CDR Okay.
00 00 51 57 CC 15, Houston through Carnarvon. Over.
00 00 52 00 CDR Roger, Houston; 15. You're loud and clear.
00 00 52 04 CC You're loud and clear also.
00 00 52 07 CDR Okay; the insertion checks are coming along - -
00 00 57 54 CMP We should have MAG - -
00 00 57 55 CC 15, Houston. About 15 seconds to LOS. Estimating
United States at 1:30 GET.
00 00 58 06 CDR Roger. 1:30.
00 00 58 09 LMP Al, my doggone checklist says MAG M ought to be
on here for the UV.
00 00 58 14 CDR MAG N?
00 00 58 15 LMP MAG M, man.
00 00 58 16 CMP Yes, that's right - -
00 00 58 17 LMP Yes - -
00 00 58 18 CMP That - that - -
00 00 58 19 LMP ...
00 00 58 20 CMP - - has the color stuff there, too.
00 00 58 21 LMP Oh.
00 00 58 22 CDR - - ... take a picture ... - -

[REDACTED]

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00 00 58 23 LMP Yes. ... better get two of these. ...

00 00 58 26 CMP Davy?

00 00 58 27 CDR Yes.

00 00 58 28 CMP You want to put that on there?

00 00 58 30 CDR ... monitor?

00 00 58 31 CMP Yes.

00 00 58 33 CDR Yes. I don't know what we're going to do with this thing. I guess Jim has to hold this during TLI. Or something like that.

00 00 58 44 LMP Why - why can't I put it on the bracket?

00 00 58 47 CMP You can.

00 00 58 48 CDR ... Okay. Where's the bracket?

00 00 58 56 CMP It's down in - A-1.

00 00 59 00 CDR Okay.

00 00 59 03 LMP Bracket's in A-1.

00 00 59 04 CDR Okay. ... get it.

00 00 59 20 CMP Man, that was some fantastic ride! Gaa!

00 00 59 26 CDR Something you're not likely to forget for a while.

00 00 59 32 LMP And when you get a chance, Al, I need the - the UV bracket.

00 00 59 36 CMP Okay.

00 00 59 46 CMP The UV bracket, and the UV ..., and the UV lenses.

00 00 59 50 LMP Yes.

00 00 59 51 CMP Yes.

00 00 59 54 LMP Am I supposed to be ... you, Al?

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00 00 59 56 CMP No.

00 00 59 57 LMP Okay.

00 01 00 02 CMP Here's the UV lenses.

00 01 00 18 CMP Here's the UV bracket.

00 01 00 25 CDR Camera checkout. Can I have the ... up here, Jim?

00 01 00 32 LMP Yes.

00 01 00 33 CDR Yes.

00 01 00 34 LMP Okay, Al. Where'd it go? Let me trade you. Hold the lens for me. While you're holding the lens - If you'll hold that, I'll get you the bracket.

00 01 00 42 CMP Okay. I'm holding it.

00 01 00 58 CMP Okay. ... UV bracket.

00 01 01 06 LMP Could you put this - here, I guess - can you put this lens away? Up there, or do you want me to keep it up here?

00 01 01 12 CMP ... You'll - you'll need it if you take any color pictures. ... lots of ... already. What's the matter, Davy?

00 01 01 30 CDR (Laughter) You got to have the pyro arm circuit breakers in to turn the RCS command on.

00 01 01 36 CMP How about that?

00 01 01 38 LMP We're going to keep you honest.

00 01 01 40 CMP Okay, where do you want it?

00 01 01 41 LMP I'll take the - -

00 01 01 42 CMP Oh!

00 01 01 43 LMP I'll take the lens now.

00 01 01 44 CMP Hmm. Okay. ...

[REDACTED]

00 01 01 53 CDR ...

00 01 01 58 CMP Okay, your pitch rate.

00 01 02 01 CDR Why don't you - -

00 01 02 03 CDR Good ...

00 01 02 04 CMP Okay, pitch?

00 01 02 05 CDR Yes. Pitch, roll; roll, pitch. Good ...

00 01 02 11 CMP Good.

00 01 02 14 CDR And quad D going open.

00 01 02 21 CMP ...

00 01 02 22 LMP Let me know when you all are - -

00 01 02 24 CMP ... in the way.

00 01 02 26 LMP - - ready for your TSBs, and I'll hand them to you.

00 01 02 28 CDR Okay. Hey, you can give me mine, Jim. He's taking yours.

00 01 02 31 LMP Then when you get a change - -

00 01 02 33 CDR Okay, ... TV bracket.

00 01 02 34 LMP - - you can give it back.

00 01 02 51 LMP Okay, Al, here's your TSB.

00 01 02 53 CMP Okay. ...

00 01 02 56 LMP Dave, here's yours.

00 01 02 58 CDR Gee, thanks a lot, Jim.

00 01 02 59 LMP Any time.

00 01 03 07 CDR ... but the University of Michigan was well represented.

[REDACTED]

00 01 03 11 LMP Is that right? (Laughter)

00 01 03 14 CDR Yes. Couple of little calling cards here.

00 01 03 16 LMP You know, I keep going up to the top of the vehicle.

00 01 03 18 CDR Well, that's a common phenomenon.

00 01 03 20 LMP Up toward that hatch.

00 01 03 21 CDR Everybody always has.

00 01 03 22 CMP ... funny.

00 01 03 24 CDR That's exactly right. We did that for 10 days and never figured out why.

00 01 03 38 LMP Shoot! ... somebody ... this hatch. ...

00 01 03 45 CDR Al, I'm going to give you the ... to put back up there.

00 01 03 47 CMP Okay.

00 01 03 48 CDR So we don't lose track, here.

00 01 03 51 CMP That's the name of the game for the next 12 days, gang. Put it back.

00 01 03 56 CDR ...

00 01 04 14 CDR Okay. Let's see, Al. Do you have the -

00 01 04 17 CMP What? The TV lens? Where's the TV?

00 01 04 20 CDR Right on the couch.

00 01 04 23 CMP ... back here and see if I can bump into it.

00 01 04 26 CDR Okay.

00 01 04 27 LMP Do you have the right settings on it? Want me to read them to you?

00 01 04 29 CMP Yes, what are they?

00 01 04 34 LMP I don't know why we've been putting that TV up so early.

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00 01 04 37 CMP Just to get it out of the way.

00 01 04 46 LMP Okay. We want ALC to peak. And f/44.

00 01 04 55 CDR Peak - and average.

00 01 05 02 LMP ALC to peak.

00 01 05 03 CMP No, wait a minute; f/44.

00 01 05 10 CDR Okay, f/44.

00 01 05 12 LMP Yes.

00 01 05 30 LMP Guess we - we might as well leave the - the lens cover on until we're ready to use it.

00 01 05 35 CMP Dave, did you do - do that SCS attitude reference - reference check?

00 01 05 38 CDR I'm doing it right now.

00 01 05 39 CMP Okay.

00 01 05 52 LMP Sunrise in about 16 minutes.

00 01 05 57 CDR Okay, f-stop at 44, with about - ...

00 01 06 04 CMP Get the - Judge that - -

00 01 06 07 CDR Okay.

00 01 06 08 CMP - - ground direction.

00 01 06 09 CDR - - ... f-stop, 30, and the focus at - at infinity. ...

00 01 06 20 CMP That's right.

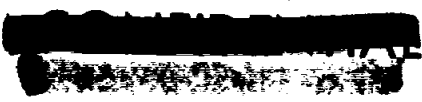
00 01 06 21 CDR I'll take those. I guess it doesn't really matter ...

00 01 06 25 CMP Yes.

00 01 06 26 CDR Okay, Jim, if you want to stick that in the -

00 01 06 31 CMP ... back you up.

00 01 06 35 CDR And I'll plug it in.



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00 01 06 56 CMP Okay. Attitude reference check.

00 01 07 00 CDR Okay.

00 01 07 15 CDR Hey, Jim. You got the SPS monitoring check all right? ECS monitoring check? EPS?

00 01 07 23 LMP Yes. I've taken care of all those checks, Davy. ... come up to the - docking probe.

00 01 07 35 CDR Yes.

00 01 07 37 LMP After that SCS reference.

00 01 07 42 CDR Okay, Jimmy, you're all hooked up.

00 01 07 44 LMP Okay. If I can just get my bracket in here. Pointed in the right dir - -

00 01 07 49 CMP Do we need anything else out of A-1, before I close it?

00 01 07 53 LMP When you get a chance, Al, out of R-12, I think I need that - probably need - ...

00 01 08 01 CMP Just like that cardboard - for the window.

00 01 08 12 CDR You - you want - you want to pull R-12 out?

00 01 08 15 LMP Yes, that whole brack - that temporary sto - that bracket? Yes. Yes, I think I'll probably stow the cardboard in there.

00 01 08 26 CMP Okay. We really don't have a place to put this if you got the TV up ...

00 01 08 38 CDR That's what you got a Flight Plan volume for.

00 01 09 07 CMP Whoops.

00 01 10 03 CDR How you doing, Jim?

00 01 10 06 LMP All right - -

00 01 10 07 CMP What do we have in there?

00 01 10 08 CDR Flight Plan, Malfunctions, and all that jazz is in there.

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[REDACTED]

00 01 10 11 CMP Okay.

00 01 10 12 LMP The card - is my cardboard window shade in there, or something else?

00 01 10 15 CDR We didn't find it here ...

00 01 10 18 LMP Thank you.

00 01 10 19 CDR Probably ... supposed to be with the cue cards.

00 01 10 25 CMP Okay, I didn't find it.

00 01 10 38 CDR I don't know. Our Flight Data File boxes up here, they're almost empty.

00 01 10 44 LMP Maybe they just happened to fall open.

00 01 10 46 CDR No, there's just very little in here.

00 01 10 47 CMP That's all we need, is that Flight Plan. I talked to Ted Guillory ... all we really need. Up there is Volume I?

00 01 10 56 CDR Yes. I've already ... all through these containers.

00 01 10 58 CMP Oh.

00 01 10 59 CDR Well, we got all our data - got all that -

00 01 11 03 CMP It just doesn't take up a whole container. All those checklists ...

00 01 11 14 LMP ... There I need MAG N.

00 01 11 19 CMP You need MAG N. (Cleared throat) Okay, coming up.

00 01 11 22 CDR Where are the rest of the cue cards?

00 01 11 25 CMP I think we got the ... in the pocket.

00 01 11 27 CDR Do we?

00 01 11 28 CMP Yes, I think so.

00 01 11 29 CDR ... reversed hoses here ...

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00 01 11 41 LMP ...

00 01 11 51 LMP ...

00 01 11 52 CMP Hmm, ORDEAL.

00 01 11 54 CDR ORDEAL?

00 01 11 56 CMP Yes, man. ... seems like it can be just a hell of a ...

00 01 11 59 CDR Well, don't hurry.

00 01 12 00 CMP Yes, let me - get my coffee here.

00 01 12 04 CDR Yes.

00 01 12 10 LMP Did you finish that check, Dave?

00 01 12 14 CDR Yes, the attitude reference check is complete.

00 01 12 22 CMP Goddam ...

00 01 12 25 CDR The what?

00 01 12 26 CMP ... the whole spacecraft.

00 01 12 41 CMP Yes, the red one.

00 01 12 44 CDR Here's MAG M, Jim.

00 01 12 48 LMP Okay. ...

00 01 12 50 CMP Okay, coming down to ORDEAL, David.

00 01 13 11 CMP Oh! ... can't - we can't do this - ... I can see ... hoses ...

00 01 13 15 CDR Al, don't ... - -

00 01 13 16 CMP Okay, there we go, Dave.

00 01 13 17 CDR No, that's all right.

00 01 13 18 CMP I just got my hoses ... If you - if you can - -

00 01 13 24 CDR Yes, I can get it.

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[REDACTED]

00 01 13 28 CMP, Dave. There we go.

00 01 13 29 CDR Good. We got it.

00 01 13 38 CDR Okay. Got it?

00 01 13 40 CMP Yes. Thank you.

00 01 13 55 CDR Need some help?

00 01 13 58 CMP Okay.

00 01 14 06 CMP Well, this is going to be a backroom brawl.

00 01 14 09 CDR What?

00 01 14 11 CMP It's always your fault, Dave.

00 01 14 13 CDR ...

00 01 14 14 CMP Got to be ...

00 01 14 17 CDR But it's all of that?

00 01 14 24 CMP ... get myself hooked up on everything here.

00 01 14 32 LMP Hey, Al, if you get a chance on this - Did you find my cardboard window covering?

00 01 14 37 CMP No.

00 01 14 39 LMP Data Card Kit?

00 01 14 41 CDR Which part of the Data Card Kit?

00 01 14 43 LMP Well, I don't know. I don't know.

00 01 14 47 CMP Here, let me look some more.

00 01 14 49 CDR Yes. I don't even see where the cue-card part of the Data Card Kit is.

00 01 14 54 CMP Uh-huh.

00 01 14 55 CDR ...

00 01 15 08 CMP ... Data Card Kit.

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[REDACTED]

00 01 15 13 CDR Okay. ...

00 01 15 45 CMP UV Card Book ...

00 01 15 49 LMP Okay. I guess I don't need it.

00 01 15 56 CMP ... Okay.

00 01 16 06 CMP Whoop!

00 01 16 12 CDR Bet that ought to be ...

00 01 16 18 CDR (Coughing) Hey, you know, I got your meal, Al?

00 01 16 21 CMP Do what?

00 01 16 24 CDR ... chow.

00 01 16 25 CMP Oh, yes. Yes.

00 01 16 40 LMP Hey, I think I'm pretty well caught up with the UV photography here.

00 01 16 44 CDR Good, Jim.

00 01 16 45 LMP Getting around with the - -

00 01 16 47 CMP Goody, goody. Read over the procedures.

00 01 16 51 LMP Want me to read them to you?

00 01 16 52 CMP No, why don't you read them to yourself?

00 01 16 54 LMP Well, that's what I'm doing.

00 01 16 55 CMP ..., Jim.

00 01 16 56 CDR I - I - Did you get the - Oh, you're looking for the cue cards, is that right?

00 01 16 59 CMP Yes, I'm just trying to get them all sorted out.

00 01 17 02 LMP And - -

00 01 17 03 CMP ...

00 01 17 05 LMP Who has the tape?



[REDACTED]

00 01 17 07 CDR Just a second, Jim, and I'll get it.

00 01 17 11 CMP I can reach it. Have to push these back - Watch your foot!

00 01 17 17 LMP Oh!

00 01 17 18 CDR (Laughter)

00 01 17 19 LMP Man, you hit my foot; it really - -

00 01 17 21 CDR Did it really bug you?

00 01 17 22 LMP Yes.

00 01 17 35 CMP I don't think we need the Data Card Kit out right now.

00 01 17 38 LMP May - maybe we could - Is there a good place to stow this down there?

00 01 17 40 CMP Uh, I - I think you'd be better off if you stuck it right back in the window pouch, there.

00 01 17 45 CDR Is this just for this pass, Jim?

00 01 17 46 CMP Shade.

00 01 17 47 CDR Yes.

00 01 17 48 LMP Uh - -

00 01 17 49 CDR Are you going to - -

00 01 17 50 LMP Yes.

00 01 17 51 CDR - - take it down?

00 01 17 52 CMP I think - Yes, that's probably - -

00 01 17 53 CDR When?

00 01 17 54 CMP - - that's probably true. The next pass is at about ...

00 01 17 59 LMP Yes, I'll have the cardboard up for it.

00 01 18 01 CMP Yes.

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00 01 18 02 LMP I need the - probably the ...

00 01 18 04 CMP I guess we could put - we put that back up before we do TLI, don't we?

00 01 18 07 CDR Yes.

00 01 18 09 CMP You need what, Jim?

00 01 18 11 LMP Yes - -

00 01 18 12 CDR Oh, look at the horizon.

00 01 18 13 CMP Okay, you guys, let that thing be - let it be.

00 01 18 15 LMP Oh, boy!

00 01 18 16 CDR Come on up here and look at this. ... switches.

00 01 18 22 CMP Okay; all right. All right, have you got - have you got ... This is unreal to watch.

00 01 18 31 CDR You've got to watch this, boy. This is one of the beauties that few people ever - -

00 01 18 36 CMP Ah!

00 01 18 37 CDR - - get to see.

00 01 18 38 LMP ... Ooo!

00 01 18 39 CMP Gaa.

00 01 18 40 CDR ... Look at the clouds.

00 01 18 41 LMP Yes.

00 01 18 42 CDR Just watch it, there. Watch this for a few minutes. ...

00 01 18 47 CMP Look at that. You can see lightning. Looks like streaks of lightning around there?

00 01 18 54 CDR See the little light thing out there?

00 01 18 57 LMP ... Oh, yes.

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[REDACTED]

00 01 18 59 CDR Oh, yes. I didn't see that.

00 01 19 00 CMP I didn't either.

00 01 19 01 LMP ...

00 01 19 04 CMP Ooo, like - Oh, that - that's fantastic.

00 01 19 06 CDR/LMP That's a - -

00 01 19 07 CMP Yes.

00 01 19 08 CDR That's a satellite.

00 01 19 09 CMP Hey, you're right! That's got to be.

00 01 19 11 CDR Yes.

00 01 19 13 LMP Sure it's a sat - satellite, not a - a planet?

00 01 19 16 CDR That's a satellite, Jim.

00 01 19 18 CMP Well, look.

00 01 19 20 LMP Come on. ... planets are like -

00 01 19 21 CDR Son of a gun.

00 01 19 22 CMP I'm backwards.

00 01 19 25 CDR Huh, I guess it is a planet. It's sure bright, though, isn't it?

00 01 19 28 LMP Yes. ... rest.

00 01 19 32 CDR It's sure bright, but it's a planet.

00 01 19 39 CMP Is it going to be black like this all the way out?

00 01 19 46 CDR Look at those clouds.

00 01 19 47 LMP Yes.

00 01 19 48 CMP Yes, ...

00 01 19 50 CDR I've got something like ...

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[REDACTED]

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00 01 19 54 LMP ... see a damn thing.

00 01 19 55 CMP ...

00 01 19 56 CDR No.

00 01 19 57 CMP ...

00 01 20 00 CDR By golly, it's getting bright and early.

00 01 20 02 LMP I've got ... 8. ... about like this.

00 01 20 14 LMP ...

00 01 20 20 CMP That Earth is a big mother.

00 01 20 23 CDR Yes, it looks pretty big, but I think it's probably going to be small.

00 01 20 25 LMP (Laughter)

00 01 20 26 CMP Yes (laughter).

00 01 20 28 CDR I hope it does.

00 01 20 30 CMP (Cough) Yes, that must be a planet, Dave, because - -

00 01 20 36 CDR You were right.

00 01 20 37 CMP - - it's staying in inertial, and we're going ORB RATE now.

00 01 20 42 CDR ...

00 01 20 44 CMP ...

00 01 20 47 LMP Boy! Get your sunglasses.

00 01 20 49 CDR Yes, it's bright, isn't it?

00 01 20 50 LMP Boy, oh, boy!

00 01 20 55 CMP Yes. ... Let's see, I'm going to start getting up around ...

00 01 21 10 LMP I don't think you can ...

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[REDACTED]

00 01 21 11 CMP I can. ...

00 01 21 13 LMP I hear you. ...

00 01 21 15 CMP Too much trouble for me to get - for you to get ...

00 01 21 16 CDR (Cleared throat)

00 01 21 18 CMP Looks like Aquarius coming up back there.

00 01 21 20 CDR Yes. How about your rendezvous window, Jim?

00 01 21 24 LMP It's fine. Yes.

00 01 21 30 CDR Okay. ... load it with ...

00 01 21 37 LMP Yes.

00 01 21 40 CDR ... You think you need a ... there, Jim?

00 01 21 42 LMP I've got it, man. It shouldn't.

00 01 21 43 CDR I couldn't prove it to you.

00 01 21 47 CMP ... Oh, I see ...

00 01 21 51 CDR Beautiful!

00 01 21 52 CMP ...

00 01 21 53 CDR Check that.

00 01 21 54 CMP ...

00 01 21 55 CDR I've got to get that ... to dock.

00 01 22 00 CMP So you're going to ...

00 01 22 01 CDR ...

00 01 22 02 CMP Which reminds me, I've got my own docking checklist.

00 01 22 05 CDR Oh, you did?

00 01 22 06 CMP Got your ...?

00 01 22 08 CDR What's the matter with this other one?

[REDACTED]

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[REDACTED]

00 01 22 10 CMP Well, the one - the one I found, it's the one that doesn't have any, you know, any references in it.

00 01 22 15 LMP/CDR (Laughter)

00 01 22 17 CDR You never got the other one changed?

00 01 22 21 CMP There ain't no way I could do that.

00 01 22 22 CDR Okay.

00 01 22 25 CMP ... okay.

00 01 22 26 CDR ...

00 01 22 29 CMP ...

00 01 22 33 CDR We'll be watching you.

00 01 22 34 CMP Hand controller, not a ... control. Okay.

00 01 22 37 CDR Okay. Why don't ... the program?

00 01 22 39 LMP (Cleared throat)

00 01 22 40 CMP ...

00 01 22 41 CDR What do we have to do?

00 01 22 42 LMP Where are we stowing the tape?

00 01 22 43 CMP Just ... it.

00 01 22 44 CDR We should be stowing it back where it goes.

00 01 22 47 LMP Here's the tape, Al. Where are you putting it, down there?


00 01 22 49 CMP Okay. ...

00 01 22 57 LMP Well, we got 8 more minutes.

00 01 22 59 CMP ...

00 01 23 00 CDR Are you ready for the UV, Jim?

00 01 23 02 LMP Yes, ... It says 1:35.



[REDACTED]

00 01 23 05 CDR Yes.

00 01 23 07 LMP I - I guess - I guess I might as well wait until then.

00 01 23 10 CDR Yes, I think you should. Let's do everything right on the money.

00 01 23 14 CMP The UV is on time ...

00 01 23 17 LMP Yes, sir.

00 01 23 18 CDR When do we shut it off? Do you shut it off ...?

00 01 23 21 CMP Yes. I agree with you.

00 01 23 22 CDR I just want to - -

00 01 23 23 LMP Do you want to wait until we get - -

00 01 23 25 CDR ...

00 01 23 27 LMP - - AOS before we do the docking probe, don't you?

00 01 23 29 CDR Oh, I don't know.

00 01 23 30 CMP (Cough)

00 01 23 31 LMP Do you want to go through it now?

00 01 23 33 CDR Yes, let's go through it.

00 01 23 34 LMP Okay, CB DOCKING PROBE, two, close. Two, verify.

00 01 23 36 CDR Two, verify.

00 01 23 37 LMP DOCKING PROBE EXTEND/RELEASE to EXTEND/RELEASE until full probe extension.

00 01 23 41 CDR Okay, ready.

00 01 23 43 CMP Okay, here it goes. You've got it, man.

00 01 23 46 LMP Yes.

00 01 23 47 CMP Pretty good. Okay, got a barber pole to gray.

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00 01 23 50 LMP Okay. DOCKING PROBE EXTEND/RELEASE to RETRACT.
Talkback gray.

00 01 23 53 CMP RETRACT. Talk back gray.

00 01 23 55 LMP Okay.

00 01 23 56 CDR Okay, let's get ... here.

00 01 24 01 LMP There are a lot of clouds out there, huh?

00 01 24 03 CDR Sure are. ...

00 01 24 18 CDR Hey, Al, you got the - the Hasselblad down there?

00 01 24 21 CMP Yes, it's in the TSB. The Hassel - Well, the
Hasselblad's set up for the UV window.

00 01 24 25 LMP Yes.

00 01 24 26 CDR The spotmeter. Did you get ...?

00 01 24 27 CMP Yes.

00 01 24 28 LMP Yes. Yes, it's - -

00 01 24 29 CMP Sure did.

00 01 24 30 CDR The TV is all ready.

00 01 24 31 LMP Yes.

00 01 24 34 CMP ...

00 01 24 37 CDR ... the pad. You got your updates. PYRO ARM ...

00 01 24 45 LMP ...

00 01 24 47 CMP ... the TLI Prep Book.

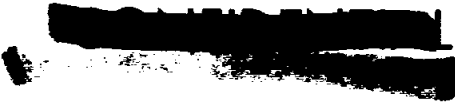
00 01 24 48 LMP Yes, ...

00 01 24 49 CDR Hey, now, do you have the TLI card in your pocket?

00 01 24 52 CMP No, I have it.

00 01 24 54 LMP No use in finding mine. I did look.

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00 01 24 56 CDR Okay.

00 01 24 59 LMP ...

00 01 25 01 CDR It must be in my ...

00 01 25 03 CMP It must be in your ...

00 01 25 05 CDR Oh, yes? You get a better ... (laughter).

00 01 25 12 CMP You carried my lunch; I carried your card.

00 01 25 16 LMP Did you really get it?

00 01 25 17 CMP Sure.

00 01 25 20 CDR ... S-IVB/TLI.

00 01 25 22 LMP ...

00 01 25 33 CMP ...

00 01 25 34 CDR Yes, I -

00 01 25 36 CMP Well, I got a ... here ... a little culture.

00 01 25 48 LMP When we get past this cloud bank, I think I might take some of these UV pictures.

00 01 25 53 CMP They want some clouds for the UV.

00 01 25 55 LMP Yes, I know. But I didn't want - -

00 01 25 57 CMP Oh.

00 01 25 58 LMP - - solid clouds.

00 01 25 59 CMP What are you all looking at out there? Can you tell?

00 01 26 01 CDR Oh -

00 01 26 03 LMP You mean what part of the world?

00 01 26 07 CMP No - about where the camera's pointing. ... They didn't care what time, but we need to correlate it. ...



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00 01 26 33 CMP (Cleared throat)

00 01 26 39 LMP ...

00 01 26 43 CMP Hey, look. There's ... out there, I think.

00 01 26 44 CDR Where?

00 01 26 45 CMP Huh?

00 01 26 46 CDR Yes.

00 01 26 47 CMP ...

00 01 26 48 CDR Yes.

00 01 26 49 LMP Oh, yes.

00 01 26 50 CDR Hey, man.

00 01 26 51 CMP Can you see ... over there?

00 01 26 52 CDR Oh, that must be it.

00 01 26 53 LMP Yes.

00 01 26 54 CDR Man. That must be it.

00 01 26 55 CMP ...

00 01 26 56 LMP I'll take some UV pictures of it.

00 01 26 57 CMP Okay.

00 01 26 58 CDR That's good, Jim. Good deal.

00 01 26 59 CMP Except I don't think we know the right time. ...

00 01 27 02 CDR Yes.

00 01 27 03 LMP Oh, you can see some of that pattern. ...

00 01 27 06 CDR ... far-reaching pattern.

00 01 27 08 CMP Hey, yes. We know where it is.

00 01 27 15 CDR ...

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[REDACTED]

00 01 27 28 CMP ... Is that the right thing?

00 01 27 40 CMP This thing is really, really weird.

00 01 27 47 LMP ... I didn't even notice the S-IVB flashes, but you can see them now.

00 01 27 52 CDR Yes. The S-IVB - -

00 01 27 54 CMP Yes, I noticed them. (Cleared throat)

00 01 28 02 CDR Well, let's see. I guess somebody's got to be ready to copy pads.

00 01 28 07 CMP Yes.

00 01 28 08 CDR Jim, I guess you're going to be busy with the - -

00 01 28 11 LMP No, no, I'll be doing that. It won't take long to do this.

00 01 28 13 CDR All right. I'll get the pyro arm check when we get the comm back.

00 01 28 19 LMP ...

00 01 28 22 CDR Al, why don't you get the - -

00 01 28 24 CMP Yes.

00 01 28 25 CDR Why don't you get this thing ...?

00 01 28 27 CMP ...?

00 01 28 28 CDR ...

00 01 28 29 CMP Okay.

00 01 28 30 CDR Okay.

00 01 28 31 CMP Do you - do you want me to ... the ...

00 01 28 35 CDR Yes. Yes, I've already scratched mine ...

00 01 28 50 CMP Get the ... quantity - -

00 01 28 54 CDR The glycol pump? Get the glycol pump?

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[REDACTED]

[REDACTED]

00 01 28 59 CMP (Cleared throat)

00 01 29 11 CC 15, Houston. Over.

00 01 29 13 CDR Hello, Houston; 15.

00 01 29 15 CC Would you put the - You're loud and clear, Dave.
Would you put the IU UP TEL - -

TIME SKIP

00 01 53 35 LMP - -, INJECT.

00 01 53 36 CDR INJECT.

00 01 53 37 LMP EDS POWER, on, up.

00 01 53 42 CDR Okay. Well, I checked the DELTA-V on the EMS; and, I guess, you might as well just hold on until we get all the way around here - until we get the ... again. There's nothing else really to do.

00 01 53 57 LMP Okay. You got EDS POWER, on, up?

00 01 53 58 CDR No, hold - -

00 01 53 59 LMP You want me to hold off?

00 01 54 00 CDR Yes.

00 01 54 01 LMP Okay. ...

00 01 54 02 CDR Really not much more to check. GDC a line; I'll wait until we get a little bit farther down the road to do that.

00 01 54 10 LMP Okay. Where is my kitchen timer, Al?

00 01 54 13 CMP Down below. You want it?

00 01 54 15 LMP Yes, I guess I ought to put it to use when I start cycling on the cryo fans here shortly. You know, we - actually, we have plenty of time. I could put that 105 lens on again and take a colored picture.

[REDACTED]

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00 01 54 33 CMP Yes.

00 01 54 34 CDR Colored picture? ...

00 01 54 36 LMP ... there's a requirement to do it.

00 01 54 38 CDR Yes.

00 01 54 39 LMP ... - with the 105 lens.

00 01 54 41 CDR Good idea. Why not do it?

00 01 54 43 LMP It's - it's not the same place, but -

00 01 54 47 CMP Yes, yes - Well, there's no - no - If you want to take a color picture, they - what they want is a color picture to back up the scene you're seeing in the UV. So, if you can't get a color picture of that area, there's no sense taking it. But you might go ahead and take some pictures with the 80 millimeter. There's nothing wrong with that. On the - ...

00 01 55 22 CDR Have you got the Update Book out, Jim?

00 01 55 25 LMP No, I don't.

00 01 55 26 CMP Did you log - you didn't log the UV pictures in here, did you?

00 01 55 29 LMP Yes.

00 01 55 30 CMP Where did you log them?

00 01 55 31 LMP Oh, on - in the photo procedures here. ... - -

00 01 55 32 CMP No, we want to log them on the - on the ...

00 01 55 58 CMP Photo Log - 70 millimeter, MAG N, was it?

00 01 56 05 LMP Yes, MAG N.

00 01 57 27 CDR Ohh! ...

00 01 58 13 LMP (Laughter) Get the - get the ... out.

00 01 58 17 CMP (Laughter) Yes, I reckon. How's old Davy?

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[REDACTED]

00 01 58 22 CDR Oh, we're muttering along, flying across the sea.

00 01 58 32 CMP ...

00 01 58 34 CDR ...

00 01 58 40 LMP ...

00 01 58 50 CDR ...

00 01 59 22 CMP Do you have yourself strapped in the seat there, Dave?

00 01 59 24 CDR Yes. I do that most of the time, I think.

00 01 59 26 LMP Yes, I like to do - -

00 01 59 27 CDR It's a lot more comfortable. ... relative position.

00 01 59 30 CMP Yes.

00 01 59 31 CDR Because, otherwise, you're fighting the panel all the time.

00 01 59 33 CMP Yes. My problem.

00 01 59 39 CDR ...

00 01 59 40 LMP Why?

00 01 59 45 CDR ...

00 01 59 48 CMP We could take these lifevests ...

00 01 59 50 CDR Yes, we could.

00 01 59 55 CMP ...

00 02 00 01 CDR ...

00 02 00 11 CMP Should we stow the lifevests?

00 02 00 14 CDR Yes.

00 02 00 16 LMP Yes. ...

00 02 00 17 CDR Get that in there somewhere?

[REDACTED]

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00 02 00 20 CMP ...

00 02 00 38 LMP Not nearly as loud at 5 psi.

00 02 00 40 CDR Yes.

00 02 01 12 CDR Get your lifevest put away, Jim?

00 02 01 15 LMP Yes.

00 02 01 51 CDR ... things on?

00 02 01 52 LMP Okay.

00 02 02 34 CDR Got your ...?

00 02 02 40 CMP Yes, I ...

00 02 02 50 CMP Can't get it quite as tight as ...

00 02 02 59 LMP Where would you keep the Update Book?

00 02 03 07 CDR R-3 is a pretty handy place for all those books up there.

00 02 03 15 LMP Do we have a strap?

00 02 03 18 CMP Velcro ...

00 02 03 21 CDR Is there a snap up there?

00 02 03 25 LMP No, ...

00 02 04 38 CMP I think I see it now.

00 02 04 47 CDR Ah, it'll be dark pretty soon. We'll get to see the never-never land. There's no horizon.

00 02 04 58 CDR We got to have some place to put the ...

00 02 05 02 LMP Well, we could unhook it. Maybe - -

00 02 05 05 CDR Matter of fact, why don't we get everything stowed for TLI? ... couple helmets - Why don't you put it down in the LEB somewhere, and we'll just leave them there until after TLI - -

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00 02 05 15 LMP The helmets?

00 02 05 17 CDR Yes.

00 02 05 18 LMP Yes.

00 02 05 19 CDR Let's - let's just leave them until we get docked and start getting up into the tunnel - -

00 02 05 23 CMP Yes.

00 02 05 24 CDR - - put them on.

00 02 05 25 CMP Okay.

00 02 05 36 CMP Could just stick these PGA bags in there.

00 02 05 40 CDR Yes.

00 02 05 41 CMP Whoops! Did I do it again?

00 02 05 43 CDR I don't know, did you?

00 02 05 44 LMP You're pretty consistent down there, Al.

00 02 05 47 CDR I can't imagine you did that twice in a row.

00 02 05 56 CMP ...

00 02 05 57 CDR Huh?

00 02 05 58 CMP ...

00 02 06 01 CDR The emergency cabin regulator check book.

00 02 06 05 CMP ...

00 02 06 06 CDR Huh?

00 02 06 07 CMP ...

00 02 06 08 CDR Must have been.

00 02 06 14 LMP We're getting a good check at that, Al.

00 02 06 18 CDR ... Watch your big feet.

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[REDACTED]

00 02 06 54 LMP Are we going to eat before TLI?

00 02 06 57 CMP You're kidding.

00 02 07 00 CDR No, ...

00 02 07 06 LMP We need an emergency ...

00 02 07 12 CMP Sort of an early time.

00 02 07 42 CMP Okay, give me your helmet back there, Dave, and I'll stash it away.

00 02 07 46 CDR Okay.

00 02 08 03 LMP Gets dark fast, doesn't it?

00 02 08 04 CDR Yes, it does. Yes, you see never-never land out there?

00 02 08 06 CMP ...

00 02 08 16 LMP Yes. No - no horizon at all.

00 02 08 25 CMP Anything else you want ...?

00 02 08 27 CDR No, that's all right.

00 02 08 28 LMP Let's just take a look at this ... Sort of interesting.

00 02 08 33 CMP ...

00 02 08 35 CDR Yes.

00 02 08 36 CMP ...

00 02 08 50 CMP ...

00 02 09 00 CDR What, that over there?

00 02 09 04 CMP ...

00 02 09 06 CDR ...

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[REDACTED]

00 02 09 16 LMP Boy, that's - Look at that planet, how orange it is out there, Dave? Directly ahead.

00 02 09 21 CDR Yes, it is. Isn't it? How come we saw the same planet in the sunlight, Jim? Huh? Tell me that.

00 02 09 41 CMP ...

00 02 09 43 LMP It wasn't the same one.

00 02 09 44 CDR Huh? Tell me that.

00 02 09 46 LMP Oh, you're - you're still saying it's a satellite, huh?

00 02 09 48 CDR Well, I - I don't know what I'm saying now, because you convinced me it's a planet. But now, it's in the same position it was - -

00 02 09 55 LMP Yes?

00 02 09 56 CDR - - when we had sunrise as we go into sunset. So that tells me something.

00 02 10 01 CMP ...

00 02 10 08 CDR Two hours 10 minutes and 7 seconds. Turn the lights out. ... never-never ... Now I can put the COAS on it. And for the COAS, ... It's right on it. It's depressed - just about 18 degrees. ... Here we are. Here we are at ORB rate. Time's going to be 10 - 2:10. Okay, I'm going to mark it. ... Get a writing pad. Two hours and 11 minutes exactly.

00 02 11 01 CDR MARK. Two hours and 11 minutes. COAS is on - 7 degrees depressed below our image - our attitude towards the Earth.

00 02 11 24 LMP ... that flash out there ...

00 02 11 27 CDR Oh, that's the S-IVB.

00 02 11 28 CMP ... the S-IVB ...

00 02 11 31 LMP Okay.

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00 02 11 34 CMP Well, you know, that's got to be Saturn. Saturn is over by Scorpio.

00 02 11 44 CDR Yes, it could be.

00 02 11 45 CMP Yes, and Antares ...

00 02 11 57 CMP ...

00 02 12 00 CDR Look at all the ...

00 02 12 05 LMP ..., Al. The Earth?

00 02 12 08 CDR Yes.

00 02 12 19 CDR Okay, let's see. We got everything stowed now?

00 02 13 13 CDR Anybody want to eat anything now?

00 02 13 15 CMP I'm going to wait until we get everything squared away after docking.

00 02 13 20 LMP ... docking ...

00 02 13 23 CDR What did you say?

00 02 13 24 LMP ... Al ... How about yours?

00 02 13 33 CDR Okay. Is your suit dry today, Jim?

00 02 13 36 LMP Well, you haven't smelled too much urine, have you?

00 02 13 38 CDR No.

00 02 13 39 LMP Okay, it must have worked then.

00 02 13 40 CDR Good.

00 02 13 43 LMP Well, I'll tell you, I used it three or four times ... (laughter).

00 02 13 46 CDR Did you really?

00 02 13 47 LMP Yes. Three times before launch and once in orbit.

00 02 13 52 CDR God, you really ...

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[REDACTED]

00 02 13 55 LMP I really drank the Gatorade yesterday.

00 02 14 15 CDR Twenty-six minutes to go before ignition.

00 02 14 20 LMP Yes, I have ignition at 2:50:31.

00 02 14 33 LMP You want to wait until we get AOS and then start through it?

00 02 15 11 CMP We should have gotten ...

00 02 15 13 CDR What?

00 02 15 14 CMP ...

00 02 16 47 LMP We changed ...

00 02 16 49 CDR We have?

00 02 16 58 SC (Cough)

00 02 17 18 CDR Getting ready to go to sleep?

00 02 17 20 CMP No, lot of work to do ...

00 02 17 22 CDR (Laughter) Yes. About time.

00 02 17 27 CMP Yes, it is.

00 02 17 37 CDR I've been feeling a little more full in the head all the time.

00 02 17 40 CMP Yes.

00 02 17 41 CDR And -

00 02 17 42 LMP You mean it gets more and more?

00 02 17 43 CDR Well, for - it's up - everybody's a little different. For me, it gets a little more and more after the first - like 7 or 8 hours. And then it stabilizes, and you don't even notice it after the first night. I didn't. Ever - everybody's a little different. Your - your body adjusts - adjusts to the whole thing.

[REDACTED]

00 02 18 16 CMP ... feel tired quicker because we don't have anything to push against. Seems like ... - -

00 02 18 26 CDR No.

00 02 18 27 CMP - - suddenly you don't have anything ...

00 02 18 29 CDR No, I didn't feel any muscle fatigue. ... Well, Jim, why don't we go through this thing now? We're going to be ...

00 02 18 37 LMP TRANSLUNAR to INJECT.

00 02 18 39 CDR ...

00 02 18 40 LMP Verify.

00 02 18 41 CDR That's a verify.

00 02 18 46 LMP EDS POWER, on, up.

00 02 18 47 CDR EDS POWER, on, up.

00 02 18 50 LMP Perform EMS DELTA-V test and null bias check.

00 02 18 52 CDR Complete.

00 02 18 53 LMP Set DELTA-V_C.

00 02 18 55 CDR Set to 10401.1.

00 02 18 59 LMP 10401.1.

00 02 19 01 CDR Okay.

00 02 19 02 LMP EMS FUNCTION, DELTA-V.

00 02 19 04 CDR DELTA-V.

00 02 19 05 LMP GDC ALIGN.

00 02 19 07 CDR Okay, I'm ... check that.

00 02 19 16 CDR ... your ... box, it's real loose.

00 02 19 18 CMP Oo-wee! That is.

00 02 19 20 CDR ...

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00 02 19 21 CMP ...

00 02 19 30 LMP ... get that ... right.

00 02 19 54 CDR Three degrees on the GDC at 2 hours.

00 02 20 00 LMP What was it? What?

00 02 20 05 CDR Take 3 and a half degrees for 2 hours.

00 02 20 08 CMP Three and a half in 2 hours ...

00 02 20 10 CDR Yes.

00 02 20 27 CMP ...

00 02 20 29 CDR Ah. Yes, pitch and -

00 02 20 36 CDR What was the pitch? But that makes sense because we're ... in pitch.

00 02 20 41 CMP Yes.

00 02 20 43 CDR Okay. The GDC's alined.

00 02 20 46 LMP Okay. Check the - check the DAP.

00 02 20 55 CDR 31102.

00 02 20 58 LMP Good.

00 02 20 59 CDR 01111.

00 02 21 00 LMP Good. Okay, key VERB 83, at ORDEAL.

00 02 21 16 LMP You want to set ORDEAL, 90 and EARTH.

00 02 21 19 CDR It's 90 and EARTH, and it's tracking very nicely.

00 02 21 22 LMP Okay. SEQUENCE PYRO ARM, two, to on, up.

00 02 21 25 CDR PYRO ARM, two, on, up. Two on, up. Okay.

00 02 21 36 CMP You didn't get P31 after you get - -

00 02 21 40 LMP Might be a ...

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00 02 21 41 CMP Get started.

00 02 21 42 CDR Yes.

00 02 21 45 LMP Do you want to wait?

00 02 21 46 CDR Yes. Let's do.

00 02 21 47 CMP ... on the angle ... a good shape.

00 02 22 13 LMP ... to put that on and watch it?

00 02 22 14 CMP Mm-hmm.

00 02 22 15 LMP Turn it?

00 02 22 16 CMP Yes.

00 02 22 18 LMP It looks to me like you could turn it first.

00 02 22 20 CMP No, do it yourself. It's running ...

00 02 22 27 CDR Yes. Right on the money.

00 02 22 30 LMP I just don't believe we're here.

00 02 22 32 CMP Yes. It's the greatest, for sure.

00 02 22 50 CDR ...

00 02 22 52 CMP That's for sure.

00 02 22 53 CDR Yes.

00 02 22 54 LMP You think we'll ...?

00 02 23 22 CDR It's not bad up here in zero g either, is it?

00 02 23 24 CMP No, hell no, it's not too bad at all.

00 02 23 27 LMP Don't even feel supper.

00 02 23 28 CDR Did you - did you this morning?

00 02 23 31 CMP Yes.

00 02 23 32 CDR I can't imagine why people - some people suffer.

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00 02 23 37 CMP ...

00 02 23 38 CDR Make sure you take your timer down, Jim, before we start the burn.

00 02 23 43 LMP Ah - -

00 02 23 44 CMP How about putting it up in there? Okay. Set it right before ...

00 02 23 50 CDR As a matter of fact, get - get all that stuff secured. The S-IVB hasn't got much, but when we get down to the SPS stuff, why it's got a pretty good kick.

00 02 23 57 CMP Yes.

00 02 23 58 LMP Sure. Well, it ought to be all right on the girth shelf, won't it?

00 02 24 04 CDR I guess.

00 02 24 12 CMP Well, the seat's kind of tight right underneath there.

00 02 24 14 CDR Huh?

00 02 24 15 CMP Just passed through the ...; we're in good shape.

00 02 24 23 CDR Yes, should be right here.

00 02 24 25 CMP/LMP There it is.

00 02 24 27 CDR Yes.

00 02 24 35 CDR Roger, Houston; 15 here, 5 by.

00 02 24 39 CC Five by also.

00 02 24 41 CDR Okay.

00 02 30 45 CMP FUNCTION DELTA-V is on.

00 02 30 48 CDR Mm-hmm. Don't bump your head on those lights ...

00 02 30 55 CMP Yes, right.

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00 02 30 57 CDR Put your head back here in that little old cubbyhole.

00 02 31 00 CMP Think that will help?

00 02 31 01 CDR It might.

00 02 31 30 CDR ... It's daylight. Think we can see this pretty burn?

00 02 31 33 LMP Yes, I'm sure we will.

00 02 31 38 CMP You ready?

00 02 31 39 CDR Yes.

00 02 31 40 CMP 809 ... 58.

00 02 31 41 LMP Sunrise at 2:48.

00 02 31 42 CDR 58, VERB 48.

00 02 31 51 SC (Cleared throat)

00 02 31 57 LMP Okay. LAUNCH VEHICLE GUIDANCE, IU.

00 02 32 01 CDR Verified.

00 02 32 03 LMP Okay. We're standing by for time base 6.

00 02 32 06 CDR Okay.

00 02 32 15 CMP What's EPS?

00 02 32 16 CDR Burn time - 5:55. And, when you get the shutdown, you got a 2-second thruster V_I . Right?

00 02 32 27 CMP Right.

00 02 32 29 CDR ... degrees per second rate. The first one is at 59. Make sure you got that. 45 degrees pitch and yaw.

00 02 32 39 CMP That's 48 deg - degrees.

00 02 32 42 CDR ... degrees per second roll. The S-IVB guidance function ... Okay.

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00 02 33 14 CDR Do we have Hawaii all the way through the burn?

00 02 33 18 LMP I don't think so.

00 02 33 20 CMP No, we haven't. ... No, we have - -

00 02 33 23 LMP AOS at 2:5 ...

00 02 33 24 CDR We go through a keyhole - -

00 02 33 25 LMP LOS at - -

00 02 33 26 CMP No. We have LOS at 49:52 for ... minutes.

00 02 33 30 LMP No, we get them back at 2:55.

00 02 33 49 CDR Ooh.

00 02 34 12 SC (Cleared throat)

00 02 34 32 CDR Yes, well, we tried it the other day.

00 02 34 34 CMP Yes.

00 02 34 35 LMP I hope so.

00 02 34 36 CMP If you did, you can change your DELTA-V ...
20 feet per second.

00 02 35 07 CDR There's ullage.

00 02 35 08 CMP Yes.

00 02 35 09 LMP I bet you it's from the S-IVB.

00 02 35 15 SC (Cleared throat)

00 02 35 17 CDR Huh?

00 02 35 20 LMP You're running about an 80-amp load.

00 02 36 16 LMP ... what that was?

00 02 36 25 CMP ...

00 02 36 39 LMP We're down to 5 on the cabin.

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Day 1

00 02 36 43 CDR Get that waste vent closed.

00 02 36 47 CMP When do we close that?

00 02 36 48 CDR When we get ready to dock, and the cabin's up to 5 pounds.

00 02 36 52 CMP I thought we were supposed to leave some pressure for that.

00 02 36 57 LMP I think we do.

00 02 36 58 CMP Right after - -

00 02 36 59 CDR Right after TLI?

00 02 37 00 LMP/CMP Yes.

00 02 37 01 CMP I think we do it.

00 02 37 04 LMP Right after WASTE STOWAGE VENT, CLOSED.

00 02 37 14 SC (Cleared throat)

00 02 37 57 CDR There's ARIA.

00 02 38 00 LMP Keep - keep looking.

00 02 38 02 CMP ...

00 02 38 29 AA ...

00 02 38 31 CDR You don't have the S-band squelch on, do you?

00 02 38 35 LMP Yes, yes, I thought it was - -

00 02 38 36 AA ...

00 02 38 37 CDR ... we ought to be able to get that ...

00 02 38 39 AA ...

00 02 38 40 CDR Oh, that's pretty - that is loud. Isn't it?

00 02 38 42 LMP Yes.

00 02 38 45 CC Apollo 15, this is Houston through ARIA. Over.

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00 02 38 51 CDR Roger, Houston; 15. You're about 1 by 1 through ARIA.

00 02 38 57 CC Roger. You're about 3 by; clear enough to understand.

00 02 39 04 CDR What'd he say?

00 02 39 05 CMP He said we're clear enough - -

00 02 39 06 AA ...

00 02 39 07 CMP - - ..., I think.

00 02 39 09 CDR Roger. We got somebody else on the loop with us, too.

00 02 39 18 AA ...

00 02 39 22 CMP ...

00 02 39 24 AA ...

00 02 39 25 CDR - - ... UP-LINK ACTIVITY light.

00 02 39 27 CMP Okay.

00 02 39 50 AA ...

00 02 40 02 CDR It's a familiar sound, and I can't remember what I - what it is.

00 02 40 07 CMP Just a minute ... - -

00 02 40 08 CDR You can't change the frequency there. You might hook up -

00 02 40 12 CMP It seems to ...

00 02 40 19 LMP It's a bull's-eye.

00 02 40 20 CMP Why don't we hook up the speakers, and let's do some checking. ...

00 02 40 25 CDR Don't count too far.

00 02 40 27 CMP S-II SEP light.

00 02 40 28 LMP Yes.

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00 02 40 29 CMP It just came on, Dave.

00 02 40 30 CDR We have the S-II SEP light.

00 02 40 33 LMP You stand - -

00 02 40 34 CC ... SEP LIGHT.

00 02 40 37 CDR Okay.

00 02 40 43 LMP The UP-LINK ACTIVITY light went out.

00 02 40 45 CDR Okay.

00 02 41 05 AA ...

00 02 41 08 LMP Okay. Monitor launch-vehicle tank-pressure sequence.

00 02 41 11 CDR Very well. It should come on now. Come on, baby.

00 02 41 34 CDR Here it comes. Come on.

00 02 41 44 CMP It might fool you ...

00 02 41 46 CDR Yes.

00 02 41 49 AA ...

00 02 41 53 CDR And coming up on 52 minutes.

00 02 41 57 LMP Okay. ORDEAL FDAI 1 to ORB RATE; 2 to INERTIAL.

00 02 42 05 CDR Okay, stand by 1. Okay, Houston. It looks like we have a slow repress start. We're up to about - 22 or 23 on the fuel pressure. Okay; ORB RATE, INERTIAL.

00 02 42 17 LMP Okay; ORDEAL MODE, HOLD/FAST.

00 02 42 20 CDR HOLD/FAST. Go on.

00 02 42 22 LMP All right.

00 02 42 23 CC ... getting a normal repress. We're - -

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00 02 42 26 CDR Okay; normal repress. Go, Jim.

00 02 42 30 AA ...

00 02 42 34 CDR Okay; 300 on the LUNAR.

00 02 42 36 LMP And RH - -

00 02 42 37 AA ...

00 02 42 39 CDR Armed.

00 02 42 40 LMP UP TELEMETRY, CM and IU, both to BLOCK.

00 02 42 43 CDR BLOCK's on.

00 02 42 44 LMP Standing by for 56 minutes.

00 02 42 48 CDR At 54, we go 25 degrees.

00 02 42 51 AA ...

00 02 42 53 LMP What - what was that on repress that you ...
normal?

00 02 42 57 CDR It's - it's just something that's a little slow
in here.

00 02 42 59 LMP Oh.

00 02 43 00 CDR It's normally quite fast. ... At 54 minutes, we
want to be at 25 degrees.

00 02 43 11 AA ...

00 02 43 36 AA ...

00 02 43 39 CDR Wonder who all that is?

00 02 43 40 CMP Yes, I wonder?

00 02 43 42 SC (Cleared throat)

00 02 43 45 AA ...

00 02 44 05 AA ...

00 02 44 22 AA ...

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00 02 44 30 AA ...

00 02 44 44 AA ...

00 02 44 52 AA ...

00 02 45 01 CDR Coming up on 55 minutes.

00 02 45 04 LMP ...

00 02 45 08 CDR Okay. Coming up ...

00 02 45 10 LMP Okay; at 56, slew FDAI 1 to pitch at 17.

00 02 45 19 AA ...

00 02 45 59 CDR Okay. ...

00 02 46 00 LMP Seventeen.

00 02 46 04 LMP Okay; at 56:45, it should be 14 degrees.

00 02 46 10 CC ... through ARIA number 2. Over.

00 02 46 11 CDR - - ... talking to him. Houston, 15; say again.

00 02 46 20 CMP We lost him, Dave.

00 02 46 21 CC 15, Houston. You're way down in the static, but I can hear you transmit. Over.

00 02 46 28 CDR Okay; we'll pick you up at the keyhole. 56:45, you ought to be ORDEAL, OPERATE. Right?

00 02 46 36 LMP Yes, OPERATE/SLOW.

00 02 46 38 CDR What angle? 14 degrees?

00 02 46 42 LMP Fourteen degrees.

00 02 46 46 CMP ...

00 02 46 49 CDR Minus.

00 02 47 13 CMP Daylight?

00 02 47 15 LMP Yes.

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00 02 47 30 LMP Why don't they have a picture like that in the simulator?

00 02 48 01 CMP Two hours and 48 minutes.

00 02 48 17 CDR ... BLANK. ...

00 02 48 21 LMP TVC SERVO - SCS TVC SERVO POWER 1 to AC 1/MAIN A.

00 02 48 27 CDR Average g is on.

00 02 48 28 LMP Two, off.

00 02 48 29 CC Roger; average g.

00 02 48 30 CDR - - ... yet.

00 02 48 32 LMP TAPE RECORDER's going HIGH BIT RATE.

00 02 48 44 CDR THRUST mode, NORMAL.

00 02 49 33 CDR Put it in between the camera, Al. No, don't force it.

00 02 49 37 CMP ... Jim.

00 02 49 38 CDR Can you get it up there?

00 02 49 48 CDR Okay. Get ready, gang.

00 02 49 57 CDR Okay, 8 seconds. Three -

00 02 50 04 CDR Fire is on. We have ignition.

00 02 50 06 CC Roger; ignition.

00 02 50 15 CDR Okay. We're pitching now.

00 02 50 17 CMP ... full, high.

00 02 50 20 SC ...

00 02 50 22 CDR Okay. Yes.

00 02 50 24 SC ...

00 02 50 27 CDR Its tracking's real good.

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00 02 50 36 CDR Load's about a half a g. ORDEAL ... should be tracking with it.

00 02 51 03 CDR Well, it had a little surge right at this ...

00 02 51 05 CMP Picked up right there.

00 02 51 14 CDR Okay. S-IVB pressure is 40 and 30, and we had a little surge at about 1 minute.

00 02 51 20 CC ...

00 02 51 25 CDR Okay.

00 02 51 33 CDR You feel a very slight amount of bumping ...

00 02 51 37 CMP Yes, it does.

00 02 51 39 LMP Could have been vibration.

00 02 51 41 CMP Or trouble.

00 02 51 52 CDR Yaw's tracking at about 1 degree.

00 02 51 53 LMP ORDEAL's right on the money.

00 02 52 02 CMP Track is GO. ...

00 02 52 16 CDR Coming over the Hawaiian Islands.

00 02 52 40 CMP Pressures are steady. ORDEAL's tracking.

00 02 52 55 CDR Okay, Houston; 15. We're about halfway through. Pressures are steady at 40 and 30, and ORDEAL is tracking right on through.

00 02 53 02 CC ..., 15. At 3 ...

00 02 53 07 CDR Roger.

00 02 53 22 CDR DELTA-V_{CG}

00 02 53 24 CMP My countdown's going to be off probably 2 seconds here. Let's start my watch and ... it again. I want to be sure the engines ... start.

00 02 53 36 CDR You can feel it, can't you?

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00 02 53 38 CMP Yes.

00 02 53 41 LMP Converter's started.

00 02 53 42 CMP Pitchover's -

00 02 53 43 LMP I get the little surge before the bang.

00 02 53 47 CDR Okay, we're on P45.

00 02 53 50 CMP Pressure's looking good. ORDEAL's tracking. A quarter g - a half g. ...

00 02 54 00 LMP That computer has ... DSKY ...

00 02 54 04 CMP That computer ...

00 02 54 06 CDR Really?

00 02 54 14 CMP 31,925.

00 02 54 37 LMP ... pressure.

00 02 54 39 CDR Okay.

00 02 54 41 LMP ... Houston.

00 02 54 56 CDR Hey, Houston. We have about a minute to go. We're tracking 39 and 30 on the pressures, and ORDEAL's about 0.

00 02 55 04 CC 15, Houston; Roger. Looks good here.

00 02 55 06 CMP O₂ flow, high.

00 02 55 14 CDR That should be on for cut-off.

00 02 55 17 LMP Yes, that's right.

00 02 55 19 CC ...

00 02 55 29 CC ...

00 02 55 32 CMP I'll give you a countdown to 55.

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Day 1

00 02 55 42 CDR Go ahead. ... Go to ...

00 02 55 46 CMP Okay. Here's the countdown.

00 02 55 47 CDR Okay.

00 02 55 48 CMP 10, 9, 8, 7, 6, 5, 4, 3 - -

00 02 55 55 CDR Okay -

00 02 55 56 CDR SHUTDOWN, 5 plus 51. Okay. Cameras - -

00 02 56 02 CMP ... stuff down here.

00 02 56 07 CDR Okay. Al, get the data there.

00 02 56 09 CMP Yes.

00 02 56 10 CDR Check S-IVB tank pressures.

00 02 56 12 CMP Okay. S-IVB tank pressure's about 32, coming down, on the oxidizer; and about 28, coming down, on the fuel.

00 02 56 22 CC Roger.

00 02 56 23 CDR SCS TVC SERVO POWER went OFF - went OFF. PCM BIT RATE going LOW.

00 02 56 49 LMP FDAI 1 to INERTIAL.

00 02 56 52 CDR Yes.

00 02 56 53 CMP RHC number 2, locked.

00 02 56 55 CDR INERTIAL and locked. Okay, when Al gets through with ...

00 02 57 02 LMP Okay, it's time to switch around.

00 02 57 04 CDR Okay.

00 02 57 12 CMP ...

00 02 57 17 CDR Okay, Gordo. Got some data for you, if you're ready to copy.

CONFIDENTIAL

[REDACTED]

00 02 57 23 CC 15, Houston. We're getting a lot of static for some reason. Say again, please.

00 02 57 28 CDR Roger, Gordo. I've got the cut-off data for you, if you're ready to copy.

00 02 57 33 CC Go ahead.

00 02 57 36 CDR Okay. We cut off on a V_I of 35,614. TFC was plus 02; V_G was plus 145; DELTA- V_C was minus 14.9. And I've got the H-dot now, if you want it. H-dot was 4353, and altitude was 167.4.

00 02 58 08 CC 15, Houston. Most of your readback is blocked by static. Let's wait a little while and try it again.

00 02 58 14 CDR Okay, Gordo. Okay, you got all your data, Al?

00 02 58 17 CMP Yes. The EMS is off.

00 02 58 19 CDR Okay. Let's switch over. Okay. Switchy, switchy.

00 02 58 23 LMP Okay, when the COMP ACTIVITY light's out, you're just supposed to ..., Al.

00 02 58 27 CMP ... switchy, switchy.

00 02 58 30 CDR I need a VERB 66.

00 02 58 31 CMP Okay.

00 02 58 35 CDR Then when you all get down in the LEB, get that waste storage vent valve closed.

00 02 58 40 CMP/LMP Yes ...

TIME SKIP

00 03 21 14 CMP Coming up.

00 03 21 20 CDR Okay.

00 03 21 21 CMP I have a GDC ALIGN.

[REDACTED]

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00 03 21 33 CDR Okay. That's a pretty good ...

00 03 21 35 LMP ...

00 03 21 39 CDR Okay.

00 03 21 41 CMP GDC ALIGN's complete?

00 03 21 42 CDR Yes.

00 03 21 43 CMP Okay, EMS FUNCTION, DELTA-V. That's a verify.

00 03 21 45 CDR Verified.

00 03 21 46 CMP EMS MODE, NORMAL.

00 03 21 47 CDR NORMAL.

00 03 21 48 CMP Okay, got the DET set at 59:30.

00 03 21 49 CDR Right.

00 03 21 50 CMP Start that whenever you want.

00 03 21 51 CDR Okay. ...

00 03 21 53 CMP Okay.

00 03 21 55 CDR Okay, Houston; 15. 30 seconds. Okay. We're counting, Jim.

00 03 22 05 CMP Okay. At 50, we'll go to BMAGs, ATT 1/RATE 2; CMC, AUTO; and come off in CMC. There is ATT 1/RATE 2; CMC, AUTO, at 58, we'll get plus-X.

00 03 22 31 CMP One, 2, 3. Okay.

00 03 22 32 CDR Okay.

00 03 22 33 CMP Okay.

00 03 22 34 CDR Now get your valves, D. They look good.

00 03 22 35 CMP Okay. Engine valves going to SCS.

00 03 22 36 CDR ... eight, gray.

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00 03 22 39 CMP Okay. I'm going to pitch over.

00 03 22 43 CDR Okay.

00 03 22 44 CMP Here we go.

00 03 22 51 CDR Okay, Houston. We got a good SEP.

00 03 23 02 CMP Got PRIM PROPELLANT B, SECONDARY, and Delta PRIM and SECONDARY - went barber pole, and they're both gray now. ...

00 03 23 12 CDR ... panel?

00 03 23 15 CMP Yes. There goes the panels, right out to the side. Right outside.

00 03 23 18 CDR Yes, I see them now.

00 03 23 19 LMP Yes.

00 03 23 20 CDR See it?

00 03 23 21 LMP Yes.

00 03 23 22 CDR It's spinning out there. You see the - -

00 03 23 25 CMP What a view! You see the S-IVB?

00 03 23 27 LMP Not yet.

00 03 23 28 CMP ... We're at 270, now. Oh, coops. Where is it. ... - -

00 03 23 33 LMP Right over Florida.

00 03 23 34 CMP Okay. Good shape, man ... - -

00 03 23 36 CDR Are we?

00 03 23 37 CMP You look good, good, good, good. Good job. Right in there, babe. Yes, that's good. Oh, look at that.

00 03 23 46 CDR Take pictures with the cameras.

00 03 23 50 LMP Yes.

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Day 1

00 03 23 53 CMP ... on the TV.

00 03 23 55 CDR No, forget the TV. The TV looks okay. Get the camera over here and take some pictures.

00 03 24 23 CC - - Houston. Would you give us OMNI Bravo?

00 03 24 25 CDR OMNI Bravo.

00 03 24 27 CMP Okay, I'm going to give it a little plus-X.

00 03 24 29 CDR Okay.

00 03 24 30 CMP Going to CMC first.

00 03 24 33 LMP Got a T - good TV picture, Dave?

00 03 24 35 CDR Yes. ... just a little off to the side, Al?

00 03 24 38 CMP Hum? ... Okay.

00 03 24 44 CDR Don't want to get too far away, now.

00 03 24 46 CMP One, 2, 3, 4.

00 03 24 51 LMP ... TV picture is ...

00 03 24 53 CDR To the right.

00 03 24 55 CMP Back on CMC.

00 03 24 57 CDR Okay. ...?

00 03 24 59 CMP Yes.

00 03 25 11 CDR Okay, Houston. It looks like we've got a good LM in there, and we're rolling now, and the opening rates are stopped. You should have the TV.

00 03 25 21 CC Roger. We haven't got the picture up here yet. Stand by, and I'll give you a check on that.

00 03 25 26 CDR Okay.

00 03 25 38 LMP I can shift that camera if you want, Dave.

00 03 25 39 CDR No. It would just be ... the orientation the LM has for the attitude.

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00 03 25 47 CMP Yes, that is a big bang when you come off of there, isn't it?

00 03 25 50 CDR Yes.

00 03 25 58 LMP Guess we're - what, 50 feet?

00 03 26 04 CMP Take it at f/8.

00 03 26 06 CDR All I've got to look at it is the TV picture.

00 03 26 24 CC - - Houston.

00 03 26 26 CMP Go, Houston.

00 03 26 27 CC Goldstone is receiving the carrier, but we're not getting any signal on the carrier for the TV. Over.

00 03 26 34 CDR Okay, we've got a good picture on the monitor up here. You got the TV switch in the right spot, Jim?

00 03 26 40 LMP Well, it's not in TRANSMIT.

00 03 26 43 CDR What?

00 03 26 44 LMP This switch here should probably go to TRANSMIT.

00 03 26 46 CDR Well, put it -

00 03 26 48 LMP Let's try ...

00 03 26 51 CMP Check those ...

00 03 26 53 LMP Do what? How about S-BAND AUX TV to TV?

00 03 26 57 CDR Yes, sir. ...

00 03 27 08 CDR Hey, we need HIGH GAIN, don't we?

00 03 27 10 LMP You have. I've got ... use HIGH GAIN ... - -

00 03 27 11 CMP HIGH GAIN.

00 03 27 12 LMP - - ...

00 03 27 15 CDR Okay.

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Day 1

00 03 27 16 CC 15, Houston. We're getting a picture now, and the LM is coming in in the lower right-hand corner of our field of view.

00 03 27 26 CDR Okay. Slew antenna to verify oper - Do you want to do all that, Jim? That's your - Yes, go ahead; take your pictures.

00 03 27 33 LMP Well - -

00 03 27 34 CDR Of course, ... your pictures. Take your pictures. ...

00 03 27 45 CMP It was a lot slower than I thought it would be.

00 03 27 46 CDR Strange.

00 03 27 47 CMP Yes.

00 03 28 02 CMP ...

00 03 28 05 LMP As long as they're getting the picture on the OMNI, I guess there's no hurry to - that we get the high gain up.

00 03 28 13 CDR Okay, Houston. It looks like we've got a good high-gain antenna. Do you want us to give you the high gain or stay on the OMNI?

00 03 28 20 CC *** by.

00 03 28 29 LMP There's sure a lot of crap flying out - -

00 03 28 31 CC *** take the high gain, Dave.

00 03 28 33 CDR Roger. Going HIGH GAIN.

00 03 28 58 CDR Okay, Houston. We're in AUTO and MEDIUM. Looks like we got a good lock.

00 03 29 03 CC Roger. And we're getting a very good picture here.

00 03 29 05 CDR Okay.

00 03 29 06 CC ...

00 03 29 07 CMP Get the DAC going.

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00 03 29 08 CC *** on the right-hand side of the field of view.

00 03 29 19 LMP Shall I put the TV ... long, Dave.

00 03 29 22 CDR Huh! I think it looks good, Jim.

00 03 29 26 LMP I can adjust it and get it in center.

00 03 29 29 CDR No, it's - ... How're you doing?

00 03 29 39 LMP How many pictures - -

00 03 29 40 CC *** Houston. Request WIDE BEAM width, please.

00 03 29 42 CDR WIDE BEAM.

00 03 29 43 CMP I find I'm working the stick a lot more than I thought I would.

00 03 29 47 LMP Yes.

00 03 29 48 CDR Just play it cool. We've got plenty of time.

00 03 29 51 CMP Yes.

00 03 29 52 LMP Play it cool.

00 03 29 54 CDR Six on your camera would be right where you'd want it.

00 03 29 56 LMP Okay.

00 03 30 29 LMP ...

00 03 30 35 CDR Okay. I would say we were - what, Jim? 20 feet? 15? 10?

00 03 30 40 LMP I have 15 feet on the camera.

00 03 30 46 LMP Did we forget anything on that checklist, Dave?

00 03 30 49 CDR ...

00 03 30 54 CMP Okay. We're sliding in there, David.

00 03 30 56 CDR Okay. I think we're about a couple feet away.

00 03 31 03 CMP Yes.

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00 03 31 05 CDR What do you want to do?

00 03 31 07 LMP Put it at 12 frames per second.

00 03 31 08 CDR Okay, I'd go now if - -

00 03 31 09 CC *** Houston. The centering on the picture is good now, and we're getting an excellent quality picture.

00 03 31 13 CDR Very good. We're almost there. I'll be watching above the ... over here.

00 03 31 20 CMP Okay.

00 03 31 45 CMP Okay.

00 03 31 56 CDR ..., Jim.

00 03 32 01 CMP Feel it.

00 03 32 05 CDR Got it?

00 03 32 08 CMP About there.

00 03 32 36 CMP ...

00 03 32 49 CDR Help you?

00 03 32 50 LMP ...

00 03 32 51 CMP Capture. FREE.

00 03 32 57 CDR Okay?

00 03 32 58 CMP Read the checklist, Jim.

00 03 32 59 CDR Okay; let's go down the checklist. You get ... Okay. On capture, changing FREE, to damp, aline pitch and yaw -

00 03 33 09 CMP Still got a little pitch rate going.

00 03 33 11 LMP ...

00 03 33 12 CMP Huh?

00 03 33 13 CDR You're fine. Just aline pitch and yaw.

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00 03 33 19 CMP Okay.

00 03 33 20 CDR They're all alined and damped out?

00 03 33 22 LMP ... on the chart. ...

00 03 33 26 CMP Okay. Looks like we're damped.

00 03 33 27 CDR Okay; ready?

00 03 33 29 CMP We're off at a little bit of an angle.

00 03 33 30 LMP Here. I can hold this a minute. ...

00 03 33 33 CMP Okay, Dave.

00 03 33 34 CDR Yes. ... Ready to retract?

00 03 33 38 CMP Okay.

00 03 33 40 CDR Your rate's going? Don't mess around.

00 03 33 51 CDR Hard dock, Houston. Hard dock.

00 03 33 53 CMP Great!

00 03 33 54 CDR Man alive!

00 03 33 55 CMP Boy! (Laughter)

00 03 33 56 CDR I should have told you about that. I forgot about it.

00 03 33 57 CMP Yes. I'm - -

00 03 33 58 LMP I didn't think we were - it was going to ... that much.

00 03 33 59 CDR Okay. Let's - -

00 03 34 01 CMP I was expecting it.

00 03 34 02 LMP Okay; DOCKING PROBE, EXTEND/RETRACT, and talkback's gray.

00 03 34 06 CMP Gray.

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00 03 34 07 LMP SEQUENCE PYRO ARM, two, to SAFE.
00 03 34 10 CMP PYRO ARM, SAFE.
00 03 34 11 LMP SEQUENCE LOGIC, two, OFF.
00 03 34 13 CMP LOGIC, OFF.
00 03 34 14 LMP EDS POWER, OFF.
00 03 34 16 CMP EDS POWER's OFF.
00 03 34 18 LMP CB EDS, three, open.
00 03 34 21 CMP EDS, three, open.
00 03 34 24 LMP DOCKING PROBE EXTEND/RELEASE to OFF.
00 03 34 27 CMP OFF.
00 03 34 28 LMP DOCKING PROBE RETRACT, two, OFF.
00 03 34 30 CMP Two, OFF.
00 03 34 31 LMP CB DOCKING PROBE, two, open.
00 03 34 34 CMP DOCKING PROBE, open. TAPE RECORDER's going off.

TIME SKIP

00 04 11 55 LMP Okay; I'll cycle the cryo fans.
00 04 11 59 CDR Is that ON and OFF?
00 04 12 01 LMP Yes, ON for a minute.
00 04 12 03 CDR That's right, we got a change for that.
00 04 12 04 CMP You don't need the checklist. You got that silly bunch of junk. Garbage, rather.
00 04 12 15 CDR Okay; load RCS DAP. Al, you want to load your DAP?
00 04 12 20 LMP Oh, let's see. We need to load - -

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00 04 12 21 CMP Yes.

00 04 12 22 CDR ... 21101.

00 04 12 31 CDR And X1111.

00 04 12 33 CMP Yes.

00 04 12 35 CDR Load NOUN 22 attitude. Monitor APS maneuver, ...

00 04 12 40 LMP Okay; what's the attitude?

00 04 12 42 CDR 090?

00 04 12 46 CMP Yes.

00 04 12 47 CDR 257. Okay. ...

00 04 12 51 CMP I don't think you can - -

00 04 12 52 CDR Okay; 354.6. Okay; VERB 60 ENTER.

00 04 13 01 CMP VERB 60?

00 04 13 02 CDR Sixty.

00 04 13 04 CMP Okay.

00 04 13 05 CDR VERB 63 ENTER.

00 04 13 07 CMP Okay.

00 04 13 08 CDR GDC ALIGN.

00 04 14 08 CMP GDC's alined.

00 04 14 09 LMP Okay; DET, RESET.

00 04 14 14 CMP Whoops! RESET.

00 04 14 16 LMP CB, SEQUENCE ARM, two, closed.

00 04 14 18 CMP ARM is closed.

00 04 14 19 LMP Okay. Cue MSFN, because we'll be getting the LOGICs on the ARM pretty soon.

00 04 14 24 CMP Okay. Houston, 15.

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Day 1

00 04 14 31 CC ...

00 04 14 32 CMP Roger, Gordo. We're ready to get the PYRO ARMs and LOGICs on now.

00 04 14 37 CC ...

00 04 14 38 CMP Okay; LOGICs coming on. LOGIC 1. LOGIC 2.

00 04 14 50 CC ...

00 04 14 51 CMP Roger. Okay?

00 04 14 54 LMP SEQUENCE PYRO ARM, two, go to ARM.

00 04 14 56 CMP PYRO ARM coming on. They're on.

00 04 15 01 LMP Okay; TVC SERVO POWER number 1 to AC 1/MAIN A.

00 04 15 04 CMP AC 1/MAIN A.

00 04 15 05 LMP RHC and THC armed.

00 04 15 08 CMP RHC and THC armed.

00 04 15 12 LMP Okay; call P47.

00 04 15 13 CMP Yes. Okay. Let me put a belt on here to just strap myself down a little bit.

00 04 15 20 CDR Yes. That's a good idea.

00 04 15 23 LMP Yes, we're going to be right on that time, at 4:16.

00 04 15 25 CDR Got much left to do?

00 04 15 27 CMP ...

00 04 15 39 CMP Here it is.

00 04 16 01 CDR ... - -

00 04 16 02 CMP Yack!

00 04 16 03 CDR You hold that side, and I ... - -

00 04 16 04 CMP Can you see it?

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00 04 16 07 CDR ... this side. ... Here ... get these to your side.

00 04 16 16 CMP Yes.

00 04 16 29 CMP ...

00 04 16 31 CDR Okay, Jimmy.

00 04 16 32 LMP Okay; call P47.

00 04 16 39 CMP Okay.

00 04 16 41 LMP EMS MODE, NORMAL.

00 04 16 43 CMP NORMAL?

00 04 16 49 LMP Okay. And whenever we get P47 eliminated there, we're ready for S-IVB/LM SEP, on, up.

00 04 16 54 CMP Okay.

00 04 16 55 LMP Start the DAC.

00 04 16 56 CMP What?

00 04 16 57 CDR The DAC. Yes.

00 04 16 58 CMP How about the settings on the DAC?

00 04 16 59 CDR ... okay; we won't need ...

00 04 17 01 CMP All right.

00 04 17 03 CDR Jim, let's turn the page here ... see what we're going to do.

00 04 17 06 LMP Oh, okay.

00 04 17 07 CDR Now you're going to go over and start the DET.

00 04 17 09 CMP Right.

00 04 17 10 CDR CMC MODE - We do SEP; start the DET; CMC MODE, AUTO; and, at 5 seconds, thrust minus-X for 3 seconds.

00 04 17 18 CMP Okay. Coming up ...?

~~CONFIDENTIAL~~

Day 1

00 04 17 20 CDR 5 seconds.

00 04 17 22 CMP Yes, 5 seconds. ...

00 04 17 27 CDR I'll hit the SEP, and you get the DET started.

00 04 17 28 CMP Okay; when you're - when you're - on my mark, you hit the SEP and I'll hit the DET. Ready?

00 04 17 35 CDR I don't think I am.

00 04 17 36 CMP Okay.

00 04 17 37 CDR Okay.

00 04 17 39 CMP Want to do it on the minute?

00 04 17 40 CDR Yes, do it on the minute.

00 04 17 42 CMP All right.

00 04 17 44 CDR Okay, Houston, we'll SEP at 4:18.

00 04 17 47 CC ... Stand by.

00 04 17 54 CMP Boy, look at that.

00 04 17 55 CDR Five - 5 seconds.

00 04 18 01 CMP Okay. Okay.

00 04 18 03 CDR We got a SEP.

00 04 18 05 CMP We're in AUTO.

00 04 18 07 CDR/CMP Five seconds -

00 04 18 08 CDR How much now?

00 04 18 09 LMP One foot - -

00 04 18 10 CMP Three seconds. ... Okay.

00 04 18 11 CDR Yes.

00 04 18 12 CMP We've done it.

00 04 18 15 CDR Okay, Houston. We got a good SEP.

~~CONFIDENTIAL~~

00 04 18 19 LMP Okay; you can PRO on that display.

00 04 18 22 CDR Okay.

00 04 18 23 LMP You have to go into P00. Then when the activity light's out, you can key VERB 66. Okay, Al, you ready to clean it up?

00 04 18 31 CMP Yes.

00 04 18 32 LMP SEQUENCE PYRO ARM, two, to SAFE.

00 04 18 34 CMP SAFE.

00 04 18 36 LMP SEQUENCE LOGIC, two, OFF.

00 04 18 37 CMP LOGIC's OFF.

00 04 18 39 LMP CB SEQUENCE ARM, two, open.

00 04 18 41 CMP ARM is open.

00 04 18 42 CDR Okay; Al, check and see if it's clear.

00 04 18 45 CMP Okay. I can't see a thing except the LM there.

00 04 18 56 LMP I can't either, Dave.

00 04 18 57 CDR Okay.

00 04 19 02 LMP You got SEQUENCE ARM, two, open?

00 04 19 03 CMP ARM is open.

00 04 19 04 LMP CB S-IVB/LM SEP, two, open. That's my side, not yours.

00 04 19 05 CDR Yes.

00 04 19 20 LMP Now verify O₂ TANK ISOLATION valve move to gray.

00 04 19 25 CDR Hey, I can see the Rover, Jim.

00 04 19 27 LMP Can you?

00 04 19 28 CDR Yes.

00 04 19 29 CMP You mean it's there?

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00 04 19 30 CDR Yes, man.

00 04 19 31 LMP Is it really? Okay.

00 04 19 37 CDR Okay. Keep it moving.

00 04 19 41 CMP What, Jim?

00 04 19 42 LMP Give me your checklist.

00 04 19 44 CMP Oh, yes, I can't get this doggone thing ...

00 04 19 48 CDR Just put it down there and let's keep it going.

00 04 19 50 CMP Okay.

00 04 19 55 LMP Okay - Read to me. I've got to get down in the SIM bay. ...

00 04 20 00 CMP Here, I can probably do that easier than you can.

00 04 20 02 LMP Let me take - Why don't we configure our helmets and gloves off?

00 04 20 05 CDR Huh - -

00 04 20 06 CMP Yes, why not?

00 04 20 07 CDR Well, we do a maneuver here, don't we?

00 04 20 08 CMP Yes. We've got to do a maneuver to the S-IVB.

00 04 20 09 CDR Let's get through this thing.

00 04 20 11 CMP We're already doing attitude.

00 04 20 13 LMP Okay.

00 04 20 14 CMP That should take only a VERB 49, since we've already loaded it.

00 04 20 17 CDR O₂ tank 3 ISOLATION valve talkback gray.

00 04 20 19 LMP That's verified.

00 04 20 21 CDR Okay, MAP, PAN, and SM/AC POWER should be OFF. I'll get them. You're in all of that junk - -

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[REDACTED]

00 04 20 27 LMP No. Well, now -

00 04 20 29 CDR You've got all that junk on; I don't want you to scratch your helmet.

00 04 20 32 LMP Okay. Yes, take care of my helmet for me.

00 04 20 35 CDR You've got to.

00 04 20 36 LMP Yes.

00 04 20 37 CDR So you can see.

00 04 20 38 LMP That's right. Here, if you're going to get down, I'll read to you.

00 04 20 45 CDR Okay.

00 04 20 49 CMP I'm going to take my helmet off.

00 04 20 51 LMP The first one is MAPPING CAMERA, ON, to OFF.

00 04 20 58 CDR MAPPING CAMERA, ON, to OFF. Okay.

00 04 21 03 LMP And the PAN CAMERA POWER, OFF.

00 04 21 07 CDR PAN CAMERA POWER to OFF. Okay.

00 04 21 17 LMP SM/AC POWER, OFF. Down on 181.

00 04 21 26 CDR POWER to OFF.

00 04 21 28 LMP And, Al, LAUNCH VEHICLE SPS INDICATOR switch to GPI.

TIME SKIP

00 09 27 26 CDR Okay. GROUP 5, MAIN A and MAIN B on 226 ...

00 09 27 33 LMP Okay. Both those are open.

00 09 27 59 CDR Okay. Stand by.

00 09 28 16 CDR Okay. Count.

00 09 28 42 CDR Okay. I understand. Standing by.

[REDACTED]

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Day 1

00 09 28 49 CDR Eight - 8.983.

00 09 29 02 CDR HIGH GAIN, MEDIUM.

00 09 29 22 LMP ...

00 09 29 28 CDR No. No. It's not under EMS.

00 09 29 30 LMP ...

00 09 29 31 CDR What?

00 09 29 33 LMP ...

00 09 29 37 CDR No, we're not. We're talking about GROUP 5, on 229.

00 09 29 42 CMP ...

00 09 29 47 CDR No, he's also - he's talking about pilot valves.

00 09 29 49 CMP Oh, he is? ... circuit breakers ... That light.

00 09 30 05 CDR Huh! EPS GROUP 3. He said GROUP 5.

00 09 30 14 LMP He said GROUP 5?

00 09 30 15 CDR GROUP 5. It's GROUP 3 here. That's not what he's working on. He's working on the DELTA-V thrust. 8.983.

00 09 30 24 CMP 229, GROUP 3.

00 09 30 37 CDR Huh!

00 09 30 57 CDR Okay. We'll do a - we - we note that drawing 8.9 Echo 3 doesn't seem to fit what you're doing.

00 09 31 25 CDR Oh, okay. Okay. Shoot!

00 09 31 36 CDR Okay. Here goes DELTA-V A now. Okay. A is up in on, and the SPS THRUST light is off.

00 09 31 51 CMP It is? Gee! Good grief!

00 09 32 07 CDR That's correct. It's still in the up and on position, and when I went to the on position, up, the light went out. I'll just leave it there while you think about it.

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[REDACTED]

00 09 32 28 CMP Wonder why it'll do that?

00 09 32 30 CDR (Snicker) I can only think of one reason — that it's really in backwards. Did you cycle those switches ..., Jim?

00 09 32 39 CMP Aah -

00 09 32 41 CDR Yes, you did - pulled the circuit breakers out to see if the light would change any.

00 09 32 45 CMP Yes.

00 09 33 04 LMP I think I would've, too. But he - -

00 09 33 06 CDR ... contact ... that contact - (laughter). That's amazing. No. In either position, though, the light should come on.

00 09 35 02 CDR A is OFF, and the light remains off. Momentary.

00 09 35 12 CMP Huh! Is the light still off?

00 09 35 22 CDR It's a switch problem. Yes, the light's still off. I bet it was a - when we did that SEP, bet we got a little solder ball in that switch or something.

00 09 35 31 CMP Bet we did, too.

00 09 35 47 CDR Roger. Bravo is up and on; the light is off. Now Bravo is OFF and the light remains on [sic].

00 09 36 24 CDR Change out the switch.

00 09 36 25 CMP Huh?

00 09 36 26 CDR All we got to do is change out that switch.

00 09 36 28 CMP Yes. All we got to do is bring that bank on late, and turn it off early.

00 09 36 39 CDR Yes, unless you get a contact in there, we wouldn't have the ignition signal, though.

00 09 36 50 CMP (Snicker) Roger.

00 09 37 39 CDR The good thing about it, though, is that apparently the SPS THRUST light - THRUST light works okay.

[REDACTED]

CONFIDENTIAL

00 09 37 44 CMP Yes.

00 09 37 45 CDR And that's - your cue. You know, all you need, I guess, is the ignition signal - when the light's on.

00 09 38 00 CMP Yes. Right now ... give guidance the ignition signal.

00 09 39 50 CMP Aaah - Whooo! ...

00 09 39 54 CDR I think you're about checked out.

00 09 39 59 CMP I'll do one more.

00 09 40 17 CMP O₂ FLOW.

00 09 41 12 CMP Whoo. ... much of that crap.

00 09 41 16 CDR You feel pretty good about those?

00 09 41 17 CMP Yes.

00 09 41 19 CDR Good.

00 09 41 23 LMP He's doing all that.

00 09 41 24 CMP You better believe it!

00 09 41 25 CDR You want that optics calibration, don't you?

00 09 41 27 CMP Uh-huh. What's the attitude?

00 09 41 35 CDR Okay, the attitude is - well, wait until you get to P00 and you can do a little work on it.

00 09 41 48 CDR Okay, now, the attitude of VERB 49 to - it's 210, 339, 330. Okay. Going CMC, AUTO.

00 09 42 07 CMP Okay.

00 09 42 20 CDR A long way to go. 142 ... up to ... start the UVs. ...

00 09 42 39 CMP Yes, we've got several of those.

00 09 42 55 CMP ...

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00 09 43 07 CMP You ready for the UV stuff there, Dave? Well, I'm not quite through (yawn) with my stuff though. ...

00 09 43 36 CMP So you have black on one side and white on the other.

00 09 43 39 CDR Yes, ...

00 09 44 33 CDR Roger. It'll work. Good. It just came on. Would you believe? It came on.

00 09 45 01 CDR That's good. Okay. Cycling Bravo.

00 09 45 17 CDR Okay. Don't change it all, Al, to Bravo 1. Cycling several times through the middle.

00 09 45 32 CDR Roger.

00 09 45 42 CDR Okay; right in the center of the contacts with A, right between the two, I can get the light to go out. But now, when I go on up to up and on, the light comes on again. And, now I've come back to the OFF position and the light's off. So, I think you've isolated your problem.

00 09 46 03 CMP Think so, too. That just says we're going to have to use - ban - bank B this time.

00 09 46 16 CDR It says you're going to have to pull the circuit breakers on A.

00 09 46 20 CMP Yes.

00 09 46 21 CDR Before the shutdown.

00 09 46 22 CMP Yes. Well, either that or - yes, that's right, see.

00 09 46 25 CDR Because if it doesn't, there's no guarantee the switch is going to do you any good.

00 09 46 30 CMP That's right. Okay, we got an ap - optics calibration here? What - what star is it?

00 09 46 49 CMP We're at that attitude now.

00 09 46 51 CDR Oh, okay. That's - star number 1.

00 09 46 53 CMP Star number 1 again, huh? Okay.

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Day 1

00 09 47 08 CMP Okay; we should be looking right at it.

00 09 47 46 CDR Why do we get -

00 09 48 07 CDR I don't - I don't know why I get an ignition. We got the light on, but that doesn't say we have an ig - ignition signal. Threw that switch. How could that switch affect the ignition signal unless it was there from someplace else?

00 09 48 24 CMP Yes. Hey, that's right.

00 09 48 27 CDR The switch can't produce an ignition signal without something else producing the ignition signal. It sounds to me like the light circuit breaker switch.

00 09 48 37 CMP Yes.

00 09 48 38 CDR You know they took the FCSM out.

00 09 48 40 CMP I know it.

00 09 48 41 CDR ... they really got a complicated system.

00 09 49 05 CDR Okay. DELTA-V THRUST verified OFF. PILOT VALVES verified open, and we'll close the GROUP 5s.

00 09 49 14 CMP Okay. We're done - 20C.

00 09 49 17 CDR Okay, let's go to UV then. Jim, watch the Itek.

TIME SKIP

00 10 35 43 CDR Roger. Houston. Stand by.

00 10 35 47 CMP What are the angles in the Flight Plan? Isn't that where we're supposed to do this?

00 10 35 59 CMP Says "OMNI D, HIGH GAIN, minus 33 and 213."

00 10 36 13 CMP Check out 1, 2. Minus 33 and 214. 211 is what the DSKY says. Close enough.

00 10 36 37 CMP That's real.

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[REDACTED]

00 10 36 38 CDR Yes, ... Ooooh.
00 10 36 46 CMP There, David.
00 10 36 52 CDR All I got to say, Al, is good luck.
00 10 36 56 CMP Good luck with what?

[REDACTED]

[REDACTED]

[REDACTED]

DAY 2

01 08 03 06 CMP Yes. And where's the Hasselblad that's got another -
got another adapter on it? Oh, it's just this -
son of a bitch right through here.

01 08 03 42 LMP Where you going to plug that other end in, lineman?

01 08 03 44 CMP Huh?

01 08 03 45 CDR Where you going to plug that other end in? You
have a place down there?

01 08 03 50 CMP Oh, yes, yes, yes, yes, yes.

01 08 03 53 CDR Where?

01 08 03 55 LMP That's such a longer cable, though, ... Put - -

01 08 03 58 CMP Yes. Hmm.

01 08 04 05 LMP The only place that plugs in is over here in the
girth bay, isn't it?

01 08 04 09 CDR Yes.

01 08 04 10 CMP Well, how the hell do we put a PCM cable in this
thing, then?

01 08 04 14 CDR But your MAG isn't on your - You haven't got a
MAG on right now.

01 08 04 18 LMP Be very - -

01 08 04 19 CMP Okay.

01 08 04 20 LMP - - careful then.

01 08 04 21 CMP I have been, too.

01 08 04 25 CDR Look it over.

01 08 04 26 LMP Oh, my God.

01 08 04 31 CDR Fooling with your pocket's not ...

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01 08 04 34 LMP Another thing you've got to check in getting this thing on is maybe procedures.

01 08 04 37 CDR That's right. You always find - -

01 08 04 40 CMP Yes.

01 08 04 41 CDR - - operations to verify.

01 08 04 42 CMP Okay.

01 08 04 44 CDR Yes. You got to crank it around once.

01 08 04 54 CDR Well, we should now make contact.

01 08 04 59 LMP Press on.

01 08 05 02 CMP Found ... TV ...

01 08 05 08 CDR Which one?

01 08 05 18 CMP There?

01 08 05 20 CDR ...

01 08 05 23 CMP Okay.

01 08 05 28 CDR Okay. That's all right.

01 08 05 30 CMP Hmm!

01 08 05 33 CDR There you go. ...

01 08 05 37 CMP Tool.

01 08 05 41 LMP Hmm?

01 08 05 47 CDR Here. ... Let's see your MAG. Looks all right. Not going in that sprocket.

01 08 06 09 CMP Yes, it looks like it's tight back here.

01 08 06 11 LMP ...

01 08 06 13 CDR It wasn't - it wasn't before.

01 08 06 14 CMP No, I guess it - again.

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01 08 06 16 CDR Egad.

01 08 06 21 LMP ... I've never put that thing - -

01 08 06 23 CMP God damn it - there - I -

01 08 06 26 LMP Must be another cable ... - -

01 08 06 27 CMP Connector right here.

01 08 06 28 LMP There must be another cable.

01 08 06 29 CDR Yes, there is.

01 08 06 34 LMP You remember that fit check?

01 08 06 35 CMP Oh, shit.

01 08 06 36 LMP The vehicle with the - -

01 08 06 38 CMP Yes.

01 08 06 39 LMP - - with the camera down there on the sextant?

01 08 06 40 CMP Yes?

01 08 06 42 CDR You remember who took - -

01 08 06 43 CMP I didn't - No, I didn't do that.

01 08 07 01 CMP Yes, this is the EL - -

01 08 07 03 CDR Jim, don't you want to - -

01 08 07 04 CMP - - PCM.

01 08 07 05 CDR - - use the cables we've got?

01 08 07 08 LMP ...

01 08 07 16 LMP Will those cables hit - hook together?

01 08 07 20 CMP No.

01 08 07 21 LMP Fit together.

01 08 08 27 CDR Maybe we better do it without PCM.

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01 08 08 29 CMP Yes, it's a shame. That PCM thing. (Sigh) That's -

01 08 09 04 CMP That's really something.

01 08 09 22 CMP Could have sworn that goddam thing was right -
right here.

01 08 09 25 CDR No, there's never been one there. The only place
they've ever been - -

01 08 09 27 CMP Let me have it.

01 08 09 28 LMP Yes.

01 08 09 29 CDR - - was down behind the rock boxes, but you won't
reach that either.

01 08 09 30 CMP No, you just don't reach that either.

01 08 09 33 CDR There's - there's one behind each rock box.

01 08 09 35 CMP Yes?

01 08 09 37 CDR But that's - that's too long for that cable, too.

01 08 09 39 CMP That's too - Yes, that's right. Too long for the
cable.

01 08 09 50 LMP Too long for that one. ...

01 08 09 58 CDR In there?

01 08 10 00 CMP No.

01 08 10 03 CDR Look behind the screen.

01 08 10 07 CMP CDR's food locker! No. We don't have a CDR's food
locker, do we?

01 08 10 37 CMP Well, that's one of those little things I just
never had - for one reason or another, never had
checked out, I guess.

01 08 10 44 CDR I thought you had.

01 08 10 45 CMP I thought I had, too.

01 08 10 46 CDR What?

CONFIDENTIAL

[REDACTED]

01 08 10 47 CMP Thought I'd looked at everything.

01 08 10 48 CDR Not the cameras. ... camera up.

01 08 10 57 LMP Well, maybe we better press on through.

01 08 10 59 CMP Yes, okay. Let's do without it.

01 08 11 01 LMP Okay. Exposure's supposed to be here on 1/500th.

01 08 11 13 LMP ... PCM.

01 08 11 15 CDR How do you get PCM out of the DAC?

01 08 11 17 CMP Okay. 1/500ths.

01 08 11 18 LMP Twenty-four fra - frames per second?

01 08 11 20 CMP Right; 24.

01 08 11 22 LMP You want to shoot 5 percent of the MAG? You got MAG H on there?

01 08 11 26 CMP MAG H. That's correct.

01 08 11 29 LMP You want to record the percentage. I guess, right now, it's 100 percent.

01 08 11 34 CDR Can't even see 5 percent on that thing.

01 08 11 38 CMP Yes, it's about 95 percent.

01 08 11 41 CDR You can time it, Al. Take 5 percent of the total, times the 24 frames per second.

01 08 11 45 LMP Yes, you got it - -

01 08 11 46 CMP Okay.

01 08 11 47 LMP - - for 2 seconds.

01 08 11 48 CMP Okay. Yes.

01 08 11 49 LMP You got it for 2 seconds.

01 08 11 50 CMP Huh?

01 08 11 51 LMP It calls for 2 second's worth at 24.

[REDACTED]

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01 08 11 52 CMP Two seconds?

01 08 11 53 LMP Yes.

01 08 11 54 CMP Oh, okay.

01 08 11 55 LMP No, the next step is UTILITY POWER, ON.

01 08 11 58 CMP Okay - -

01 08 11 59 LMP ...

01 08 12 00 CMP - - UTILITY POWER is ON. Okay.

01 08 12 03 LMP I guess you need that. Roger.

01 08 12 04 CMP You want 2 seconds at 24 frames.

01 08 12 06 LMP Well, let me read - Yes, that's what it calls for.

01 08 12 08 CDR ... That's not 5 percent. Where do you get the 5 percent?

01 08 12 17 LMP Twenty-four ... is this here. ...

01 08 12 21 CDR Oh, about ... seconds ... We got a bunch of brange - a bunch of changes to make here, Al.

01 08 12 27 CMP Oh, okay.

01 08 12 28 LMP You're not ready to run.

01 08 12 29 CMP Okay.

01 08 12 30 LMP What you want next is disable jets A-3, B-3, C-4, and D-4.

01 08 12 35 CMP Okay. That gets the - the dark stuff out of the way. Okay, yes, that's - -

01 08 12 40 CDR Okay, here we go, A -

01 08 12 41 CMP - - protective.

01 08 12 42 CDR Read them again.

01 08 12 43 LMP A-3.

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01 08 12 44 CDR Yes.

01 08 12 45 LMP B-3.

01 08 12 47 CDR A - A-3 and B-3?

01 08 12 50 LMP Yes, Bravo 3.

01 08 12 51 CDR B-3.

01 08 12 52 LMP C-4?

01 08 12 56 CDR Bravo or Delta?

01 08 12 58 LMP No, the last one was Charlie 4.

01 08 13 01 CDR Okay, Alfa 3, Bravo 3, Charlie 4 -

01 08 13 04 LMP And Dog 4.

01 08 13 06 CDR Dog 4. Okay, they're disabled.

01 08 13 09 LMP Then we call P52.

01 08 13 11 CDR Oh, okay. Okay.

01 08 13 17 LMP We have to PROCEED there until we get the NOUN 70 display.

01 08 13 21 CDR Yes.

01 08 13 22 LMP We want all zeros in there.

01 08 13 23 CDR Want to set all zeros in there? Okay.

01 08 13 29 LMP And then we have some - a load for NOUN 88.

01 08 13 31 CDR Yes, right. Okay.

01 08 13 38 LMP Okay, NOUN 88.

01 08 13 40 CDR Yes. Read them off.

01 08 13 41 LMP Minus 10820.

01 08 13 46 CDR Go.

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Day 2

01 08 13 47 LMP Minus 79037.

01 08 13 51 CDR All right.

01 08 13 52 LMP Minus 60300.

01 08 13 59 CMP Before we blow it, let's make sure that there's no PCM cable that'll really -

01 08 14 05 LMP Okay, we - we got a few more steps to do here anyway. Verify the - -

01 08 14 08 CMP Houston, 15.

01 08 14 10 LMP Wait a minute.

01 08 14 18 CMP Okay. With the sextant photo test here, we have a call for a PCM cable, and the only ones we have on board will not reach the connectors over by the right-hand girth shelf. Do you have any suggestions on how we can get the DAC connected to the PCM?

01 08 14 42 CMP Okay.

01 08 14 45 LMP Okay, Al, you can verify through the sextant, if you can, that the optics are boresighted on the target.

01 08 14 53 CDR Okay. We want to proceed on this display, right? Okay.

01 08 15 15 CDR Okay, now I'm going down to the station there and see if I can see that -

01 08 15 58 CDR Yes, that one's right.

01 08 16 06 CMP Okay, Jim.

01 08 16 08 LMP Okay, G&N POWER AC on panel 5 comes off.

01 08 16 12 CDR Yes, you want to turn G&N POWER off?

01 08 16 15 LMP It's off.

01 08 16 16 CDR Okay.

CONFIDENTIAL

01 08 16 17 LMP And mount the DAC on the sextant.

01 08 16 18 CMP Okay.

01 08 16 19 LMP Then we're ready to dim interior lights; then you can turn the DAC on, 24 frames per second for 2 seconds.

01 08 16 25 CMP Twenty-four frames per second for 2 seconds, you want? Let's wait until we get an answer from them on the PCM.

01 08 16 30 LMP Yes.

01 08 16 31 CDR Yes. Here's a cap comes right here. It's ...

01 08 16 38 CMP That came out of the - that's the electrical connector for the suit.

01 08 16 41 CDR Yes.

01 08 16 42 CMP The cover. If you'd just find my spoon, I'd be a lot happier.

01 08 16 45 CDR Yes.

01 08 16 46 CMP Why don't you put that in your pocket and then put on suits when we get the PRDs up.

01 08 16 49 CDR Yes.

01 08 16 50 LMP Okay, Al. Another thing after this - Then you change the time and, 1/60th of a second, you take one frame at 60 - 60 seconds exposure time, one frame at 20, one frame at 5, and one frame at 1.

01 08 17 06 CMP Okay.

01 08 17 11 LMP Let's see. You want - Let's see. You want ...?

01 08 17 16 CMP I don't care.

01 08 17 20 CDR ... seconds ... watch.

01 08 17 24 CMP Yes. We want to turn out as many lights as we can.

01 08 17 26 LMP Yes, let me put the shades up then.

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Day 2

01 08 17 28 CDR Okay.

01 08 17 30 CMP Put all the shades up and turn out all the lights inside.

01 08 18 18 CDR We came all the way out here for some poor guy, we might as well try and do his experiment right.

01 08 18 27 CMP Is this for "Dim Light" Dunkelman?

01 08 18 29 CDR Yes. Bob Mercer.

01 08 18 31 CMP Oh, yes.

01 08 18 33 LMP Try and do it right.

01 08 18 57 LMP You sure that other cable won't work on that camera? The one for the EL?

01 08 19 03 CMP No.

01 08 19 04 CDR Let's try it.

01 08 19 05 CMP Try it and see. It's -

01 08 19 12 CDR This here?

01 08 19 13 CMP It's always been my understanding that it wouldn't. It's not long enough anyway, I don't think.

01 08 19 19 LMP We really can't do a thing.

01 08 19 32 LMP See if it'll hook to the bottom one.

01 08 19 54 LMP No, it's too short.

01 08 19 55 CMP Certainly.

01 08 19 56 LMP Shit, it's not even close.

01 08 19 58 CMP Sure.

01 08 19 59 LMP ...

01 08 20 00 CMP Sure.

01 08 20 01 CDR You can't - can't fit them together.

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[REDACTED]

01 08 20 03 CMP God damn it, there's an outlet down here somewhere.

01 08 20 07 CDR Maybe that'll go behind the - rock box, Al.

01 08 20 10 CMP Huh?

01 08 20 11 CDR Fit - will that fit on the camera though? Will this piece go onto the camera?

01 08 20 19 CMP I think that's the same kind of connection as on the - on the Hasselblad.

01 08 20 23 LMP Yes.

01 08 20 24 CDR There you go, behind the rock box. Jawohl. Yes.

01 08 20 29 CMP That seems like a -

01 08 20 34 CDR That's a hell of a thing to have to do, but I think there's one in - back there. I remember seeing it during checkout. Right there. There's one way back in there.

01 08 21 04 CDR Well, there used to be one back here.

01 08 21 06 LMP Yes.

01 08 21 12 CDR SCIENCE INSTRUMENTATION, 162.

01 08 21 15 LMP How about that.

01 08 21 18 CDR That's - see? It's not long enough to go there. (Laughter).

01 08 21 27 CMP You're kidding.

01 08 21 28 CDR Uh-uh.

01 08 21 29 LMP How about just - Isn't there one on the other side, Dave?

01 08 21 31 CDR Yes, but it's - There is, but if it's not long enough to go on this side, it certainly won't go on the other side. Does that look that kind like - -

01 08 21 39 CMP That's the G&N.

01 08 21 40 LMP Yes.

[REDACTED]

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Day 2

01 08 21 41 CDR Does that look like the right kind of plug, anyway, Al?

01 08 21 42 CMP Yes. Yes, it does.

01 08 21 45 CDR Houston, 15.

01 08 21 49 CC I guess we have to agree that the cable doesn't reach all the way over to 227, and the request down here is that you voice-record shutter opening and closing on the S - on the DSE.

01 08 22 01 CDR Okay, I'll voice-record shutter opening and shutter closing. We'll do that. What's the number of that panel down there, Al?

01 08 22 08 CMP 162.

01 08 22 10 CDR Okay; and be advised, we also tried to get it to panel 162 without success. It was too short for that one, too.

01 08 22 19 CMP ... panel 162.

01 08 22 26 CDR Well, we did everything we could.

01 08 22 30 CMP Move the rock box for me, please.

01 08 22 34 CDR Nothing else you can do? You tried.

01 08 22 39 CMP Yes, I never thought about the - juice that thing down here in the LEB.

01 08 23 15 CMP Okay, Jim, let's get on with it here.

01 08 23 18 LMP Turn down the lights. Your first one'll be for 2 seconds.

01 08 23 28 CMP Okay. Let me make sure I got all the right stuff set up here - 1/24th [sic] and 1/500th.

01 08 23 37 CDR Jim, make sure your tape recorder's going. You record the starts and stops like nobody does.

01 08 23 41 CMP That right? Yes, I will.

01 08 23 43 LMP Tape recorder's moving.

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[REDACTED]

01 08 23 45 CMP It is moving?

01 08 23 46 LMP Yes.

01 08 23 47 CMP Okay; you ready?

01 08 23 49 LMP Yes, I'm ready. Two seconds.

01 08 23 50 CMP Okay. Okay, 2 seconds. Count now, one, 1000; two, 1000; OFF.

01 08 23 57 LMP Okay. Change to time and - 1/60th.

01 08 24 01 CMP Okay.

01 08 24 03 LMP Time and 1/60th.

01 08 24 07 CMP Okay, it's time and 1/60th.

01 08 24 09 LMP Okay, and the first one'll be 60 seconds.

01 08 24 12 CMP Okay. Have you got the clock running there?
You can - -

01 08 24 15 LMP Give me a mark, and I'll tell you when to stop it.

01 08 24 17 CMP Okay, on my mark -

01 08 24 19 CMP MARK.

01 08 24 49 CMP I think you'd be better off if you turned that off, Jim. Just - Can you see the timer without turning that light on? Yes. You going to tell me at 1 minute?

01 08 25 11 LMP Try it again with the kitchen timer.

01 08 25 13 CMP Huh?

01 08 25 14 LMP Try it again with the kitchen timer.

01 08 25 15 CMP Oh, okay.

01 08 25 16 LMP Stand by.

01 08 25 19 LMP MARK.

[REDACTED]

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01 08 25 21 CMP Okay.

01 08 25 22 LMP That's on the kitchen timer.

01 08 25 23 CMP Okay; let's take two of that.

01 08 25 25 LMP Yes.

01 08 25 26 CMP At - -

01 08 25 27 LMP Okay - Why don't you give me a mark, and I'll start the kitchen timer.

01 08 25 32 CMP Okay. Let me make sure I got this set up right.

01 08 25 36 CDR That would be a - Okay.

01 08 25 48 CMP Okay. You ready?

01 08 25 50 LMP Yes, I'm ready.

01 08 25 52 CMP On my mark -

01 08 25 55 CMP MARK.

01 08 26 08 LMP When you hear the "ding," why, you can release it.

01 08 26 11 CMP Okay.

01 08 26 35 CMP I must say, if that recorder's working okay, I must say that I don't think this - photography's going to come out very good because there's an awful lot of bright - great number of bright particles right out in front of the spacecraft.

01 08 26 57 LMP Ding.

01 08 26 58 CMP Okay.

01 08 26 59 CDR MARK.

01 08 27 00 CMP Now what's the next one?

01 08 27 01 LMP The next one's 20 seconds.

01 08 27 03 CMP Okay. Same - 1/60th?

CONFIDENTIAL

[REDACTED]

01 08 27 08 LMP Yes.

01 08 27 10 CDR We want that one much.

01 08 27 30 LMP Standing by for your call.

01 08 27 31 CMP Okay. On my mark -

01 08 27 33 CMP MARK.

01 08 27 50 LMP Stand by.

01 08 27 53 LMP MARK.

01 08 27 54 CMP MARK. Okay.

01 08 27 55 LMP ...

01 08 27 59 CMP Okay. What's the next speed there, and time?

01 08 28 02 LMP Next one is 5 seconds.

01 08 28 05 CMP Okay. On my mark.

01 08 28 10 CMP MARK.

01 08 28 12 LMP Okay. Stand by.

01 08 28 16 LMP MARK.

01 08 28 17 CMP Okay.

01 08 28 18 LMP Okay, next one's - 1 second.

01 08 28 21 CMP Okay. One second?

01 08 28 25 LMP One second.

01 08 28 26 CMP Okay.

01 08 28 32 LMP Okay - -

01 08 28 33 CMP Hmm!

01 08 28 36 CDR Lucky.

01 08 28 37 CMP That sure does look funny.

[REDACTED]

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01 08 28 41 LMP Sounds like we got more than one frame.

01 08 28 43 CMP Huh?

01 08 28 45 LMP Sounded like you got more than one frame.

01 08 28 46 CMP Yes, it did.

01 08 28 48 LMP Do you show it time and 1/60th?

01 08 28 57 CMP No, I'm at 1 frame per second.

01 08 29 01 LMP You should have been on time.

01 08 29 02 CMP All right. I'll take one on time for 1 second.

01 08 29 04 LMP Well, how about - All the others were okay though?
Yes.

01 08 29 07 CMP Yes, all the others are okay.

01 08 29 08 LMP Yes. Yes.

01 08 29 09 CMP That - the last two are going to be - one's going to be maybe a couple of frames at 1 second, or one - or a couple of frames per second - yes, at 1 frame per second.

01 08 29 18 LMP Well, why don't you just take a 5-second one then?

01 08 29 20 CMP At 1/60th. Huh?

01 08 29 22 LMP In other words, you want to repeat the 5 second, too?

01 08 29 25 CMP No. No.

01 08 29 28 CDR One frame per second's going to be a lot different from 1 second per frame.

01 08 29 30 LMP One frame per second is a lot different than 1 - second frame.

01 08 29 33 CMP I know it.

01 08 29 34 LMP Yes. That's what I'm saying. Maybe we ought to repeat the 5-second exposure.

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[REDACTED]

01 08 29 39 CMP No, that should be all right. I did that on time.

01 08 29 43 LMP Okay.

01 08 29 48 CMP Okay.

01 08 29 49 LMP Okay, okay, go back to 24 frames per second.

01 08 29 53 CMP Okay. (Sneeze).

01 08 29 56 LMP And 1/500th.

01 08 29 58 CMP And 1/500th; oo, that's going to be a - Okay.

01 08 30 06 LMP And then run the DAC for 2 seconds.

01 08 30 11 CMP Okay.

01 08 30 13 LMP And then lights up, enable jets, and do a VERB 49 to another target.

01 08 30 22 CDR Okay.

01 08 30 23 LMP Don't know what time it is.

01 08 30 24 CDR I got them.

01 08 30 27 LMP Did you get the jets enabled yet, Dave?

01 08 30 29 CDR Coming up.

01 08 30 32 LMP Okay, VERB 49.

01 08 30 37 CDR Let me make sure I get the right jets, A-3, C-4, B-3, and D-4.

01 08 30 43 LMP Right.

01 08 30 49 CDR Okay.

01 08 30 50 LMP Give me a VERB 49.

01 08 30 59 CDR Okay, 239, 169, 330.

01 08 31 16 LMP Okay, 239, 169, and 330. That's wrong.

01 08 31 23 CDR Really?

[REDACTED]

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01 08 31 26 CMP Is that for the sextant or the UV?

01 08 31 30 CDR We have to do another with the ...

01 08 31 42 CMP Gee. Well, that's fair enough.

01 08 31 46 LMP Go maneuver.

01 08 31 48 CDR Golly, that's a -

01 08 31 54 LMP And, Al, when we get there, we'll repeat - repeat step 3, yes.

01 08 31 59 CMP What? With the sextant and stuff?

01 08 32 00 LMP Yes.

01 08 32 01 CMP Oh, I thought we were done with it.

01 08 32 02 LMP No, no, I'm sorry. We got a whole bunch more. We've got - -

01 08 32 05 CMP Oh.

01 08 32 06 LMP - - to do the same thing on another target.

01 08 32 07 CMP Oh, okay, okay.

01 08 32 09 LMP Now that you got it all put away.

01 08 32 11 CMP Sorry about that. Speak up there, James. Okay, we got to maneuver?

01 08 32 19 LMP Yes, we're maneuvering now. Oh, boy.

01 08 32 33 LMP I didn't tell you to remove the stuff, Al.

01 08 32 36 CMP Huh?

01 08 32 37 LMP I didn't tell you to remove it. Stop.

01 08 32 39 CMP Tough. Why, we're doing the UV next, James.

01 08 32 45 CDR Time wise?

01 08 32 46 LMP We're a little behind. We're at 25.

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01 08 33 03 CDR UV. By golly. You got to hustle, man. I'll be getting some of that stuff out for you.

01 08 33 44 CDR They want you to take all the MAGs over on this thing.

01 08 33 46 LMP Yes.

01 08 34 11 CMP Want to get all your MAGs out and stuff like that to take over, huh?

01 08 34 15 CDR Yes, since you're down there - why don't you?

01 08 34 20 LMP Get the ones in - -

01 08 34 21 CDR R-13. They're almost all in R-13, Jim.

01 08 34 24 CMP Okay. That's all over by Jim there.

01 08 34 26 LMP Yes.

01 08 34 28 CMP I think I can help.

01 08 34 29 CDR A-8 - There are three MAGs in A-8 you can get out, Al. You can get those; S, T, and U.

01 08 34 35 CMP They're in A-8, huh?

01 08 34 36 CDR Yes.

01 08 34 37 CMP Okay. Yes, that's right. Those are those - Hasselblad things, since they're in there.

01 08 34 45 LMP You want me to take these out of R-13 now, Dave?

01 08 34 48 CDR Yes. Let's just get them all ready.

01 08 34 52 LMP Tie them down there on the couch some way?

01 08 34 57 CMP Let's see. How about O, P, and Q?

01 08 35 00 CDR No. Well, all ours are double letters, really, Al.

01 08 35 04 CMP Yes.

01 08 35 05 CDR So anything that's a single letter is yours. So what I'm really looking for is SS, TT, and UU.

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Day 2

01 08 35 18 CMP Hmm.

01 08 35 45 CDR Yes, and then you got to have the UV done, the TV out, and be over there for a TV pass in an hour.

01 08 35 51 LMP That's ... Okay.

01 08 36 00 CDR We need the jettison bag out of A-2, Al. If you're in that vicinity.

01 08 36 09 CMP Okay.

01 08 36 26 CMP Very strange. I don't see any SS, TT -

01 08 36 30 LMP Well, if it just says "LM S, T, and U," that's good.

01 08 36 34 CMP Oh, hey, in here. Yes, I guess this is it here. They didn't mark them double. I bet you this is it.

01 08 36 43 LMP Sorry about that.

01 08 36 49 CMP Yes, LM S, T, and U.

01 08 36 50 CDR Yes. Can you get us the jettison bag out of A-2?

01 08 36 53 CMP Yes.

01 08 37 17 CMP That your UCTA down there, Jim? Leaking all over.

01 08 37 21 CDR Is it really?

01 08 37 23 LMP Where? I don't see it.

01 08 37 25 CMP Well, I bumped it, and it's just - coming all over me. Okay. Now what do you want out of A-2?

01 08 37 36 LMP Want a jettison bag.

01 08 37 39 CMP Okay.

01 08 37 49 CDR Thank you.

01 08 38 09 LMP Okay. Now for the ...

01 08 38 15 CDR Let's see. You want 13, there.

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01 08 38 21 CMP Okay. Are we in attitude yet?

01 08 38 23 LMP No, not yet, Al.

01 08 38 25 CDR No, we're not there, Al. We've got a ways to go.

01 08 38 27 CMP Okay.

01 08 38 33 LMP ... I think ...

01 08 38 44 CDR Fine. That's got it. Okay, we got it. Going to be a ... got on your hands.

01 08 38 52 LMP We're not there yet. We need utility straps and retainer straps.

01 08 38 57 CDR I'll be getting those.

01 08 38 58 LMP Okay.

01 08 38 59 CMP From where?

01 08 39 01 LMP Over from R-5.

01 08 39 03 CMP Huh?

01 08 39 04 CDR You get those ...?

01 08 39 06 CMP R-5?

01 08 39 07 LMP No, we don't need -

01 08 39 08 CDR Forget it, Al.

01 08 39 09 CMP Oh, okay. Yes.

01 08 39 10 CDR Peanuts. Let's really get the big stuff.

01 08 39 12 CMP Yes. Okay. You got the film? Okay.

01 08 39 22 CDR And - Got a ways to go. We want to get the LM Data Kit, in R-3. Okay, Ac - -

01 08 39 34 CMP Yes, that's right here.

01 08 39 35 CDR - - Activation Checklist in R-3. Because - R-3's connected with -

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Day 2

01 08 39 54 CMP The LM Data Card Kit?

01 08 39 57 CDR Well, the whole thing. The LM Data Kit should be in there.

01 08 40 02 CMP Oh, that's it, probably, stored back there.

01 08 40 14 CMP Is that it?

01 08 40 15 CDR Yes. Should be Activation Checklist.

01 08 40 21 LMP You want this all over there, Dave?

01 08 40 23 CDR Yes.

01 08 40 28 LMP Activation Checklist.

01 08 40 30 CDR Why don't we just take the Activation?

01 08 40 32 LMP Yes, take the other thing when I'm not looking.

01 08 40 34 CDR Yes.

01 08 40 46 LMP Just a second.

01 08 40 53 CMP What say? Put it back up? Yes.

01 08 41 12 CDR ...

01 08 41 15 LMP Let's see how close we are. Let's see. ...

01 08 41 24 CMP Yes, I can get it out for you, if you want. Here it is.

01 08 41 25 LMP ...? We got another 30 degrees to go.

01 08 41 30 CMP All right.

01 08 42 12 LMP ...

01 08 42 15 CMP Jim, you're absolutely unreadable. I can't make out a word you're saying, usually.

01 08 42 20 LMP Okay. I got it, Al.

01 08 42 21 CMP There you go. I can hear you. Got the cables?

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01 08 42 29 LMP Yes. I got them.

01 08 42 30 CMP Okay. You want the bracket?

01 08 42 35 LMP No.

01 08 42 36 CMP This is going to be just hand held.

01 08 42 37 LMP Taking it over to the LM.

01 08 42 39 CMP Okay.

01 08 42 42 LMP Keep watching the monitor.

01 08 42 44 CMP Yes. Okay.

01 08 42 47 CDR Hey! How did you ever get L-2 closed, Al?

01 08 42 51 CMP L-2 closed. I didn't.

01 08 42 59 CDR Somehow -

01 08 43 04 CMP I didn't get it closed. I couldn't close it on all those cables. Could you?

01 08 43 10 CDR No. Not unless I rewind the cables.

01 08 43 12 LMP Here.

01 08 43 17 CDR Too much in here.

01 08 43 18 CMP Yes, there is.

01 08 43 44 CMP Here.

01 08 44 03 LMP Hmmm. I don't understand why I can't get A-1 closed.

01 08 44 17 CDR Huh?

01 08 44 21 LMP It's got too much in it with the strut that's in the way there. Dave, can you reach down through there and rotate that strut a little bit so that it gets - so that it's - -

01 08 44 32 CDR Yes.

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Day 2

01 08 44 33 LMP - - out of the way of the lid of A-1?

01 08 44 38 CDR No, I can't. I don't know which way to rotate the darn thing here. It's got to rotate - that's right - it's got to rotate towards you.

01 08 44 44 LMP Why don't you ... get that thing?

01 08 44 46 CDR Mmm.

01 08 44 47 LMP Get it ... I guess. Better than ...

01 08 44 51 CDR No, no, it won't go that way. It won't make any difference.

01 08 44 54 LMP ... Get it - get it all the way up ...

01 08 45 06 CDR Yes.

01 08 45 16 LMP ...?

01 08 45 17 CDR No. It doesn't bend that way.

01 08 45 27 LMP I don't know what there is about that strut there that - that changed.

01 08 45 39 LMP Well, something's different there.

01 08 45 41 CDR There sure is.

01 08 45 53 CMP The ... attitude. Why don't you do that - -

01 08 45 54 LMP Roger, OMNI Delta.

01 08 45 55 CDR Okay. I want to get my su - want to get my suit back out of the way. You got to - you got to rotate that strut.

01 08 46 03 LMP ...

01 08 46 09 CMP What are you doing?

01 08 46 10 LMP ... through there.

01 08 46 12 CDR Yes. Get my suit back out of the way here.

01 08 46 23 CDR Okay.

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01 08 46 30 LMP Okay, if we're at attitude, Dave, you want to disable those jets?

01 08 46 34 CDR ...

01 08 46 35 LMP A - Able 3, Baker 3, Charlie 4, Dog 4.

01 08 46 40 CDR Okay. They're disabled.

01 08 46 41 LMP Okay. Call P52.

01 08 46 44 CMP Okay. Okay.

01 08 46 51 LMP And we want a - all zeros and NOUN 70.

01 08 46 53 CMP Yes.

01 08 47 11 LMP And the NOUN 88 - we want the same values.

01 08 47 14 CMP Oh, we do?

01 08 47 15 LMP Yes.

01 08 47 16 CMP Oh, yes. Yes, that's right; 108. Okay. Same values, eh?

01 08 47 22 LMP Yes.

01 08 47 23 CMP Okay.

01 08 47 24 LMP It says verify that, through the sextant, that the optics are boresighted on your target. Get G&N POWER on for you.

01 08 47 36 CMP Okay, we can go to - Let me just make sure I got the same target.

01 08 47 59 CMP Yes. That's the same one. All right. Up.

01 08 48 02 LMP G&N POWER going off. Mount the DAC on the sextant.

01 08 48 08 CMP Yes.

01 08 48 09 LMP Okay, dim interior lights, and - You on 24 frames per second?

01 08 48 16 CMP Okay. I am now.

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01 08 48 18 LMP Okay, you want to do - -

01 08 48 19 CMP And - and 1/500th?

01 08 48 23 LMP Uh-huh. Yes, it'll be 1/500th.

01 08 48 25 CMP Okay. You want it 2 seconds?

01 08 48 26 LMP Two seconds, yes.

01 08 48 29 CMP Okay.

01 08 48 30 LMP Okay. Change the time to 1/60th.

01 08 48 32 CMP Okay.

01 08 48 36 LMP You there?

01 08 48 37 CMP Yes.

01 08 48 38 LMP Okay. At 60 seconds, give me a mark and I'll give you a time.

01 08 48 40 CMP 1/60th.

01 08 48 50 CMP Okay. You in what - now what do you want it now?

01 08 48 53 LMP Sixty seconds.

01 08 48 55 CMP First one 60 seconds, huh?

01 08 48 56 LMP Yes.

01 08 48 57 CMP Okay.

01 08 49 03 CMP MARK.

01 08 49 05 LMP Okay.

01 08 49 43 CMP You going to give me a mark?

01 08 49 44 LMP Mmm-hmm.

01 08 49 45 CMP Okay.

01 08 49 46 LMP About 20 seconds.

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[REDACTED]

01 08 49 58 LMP Stand by.

01 08 49 59 CMP Okay.

01 08 50 03 LMP MARK.

01 08 50 05 CMP Okay. I want to do that one again. Ready?

01 08 50 10 CMP MARK.

01 08 50 15 LMP Why you doing it again?

01 08 50 17 CMP Hmm?

01 08 50 18 LMP Why do you want to do it again?

01 08 50 19 CMP Oh, I was a little bit leary of that last one. I didn't like the way that shutter sounded.

01 08 51 05 LMP Stand by.

01 08 51 07 CMP Okay.

01 08 51 11 LMP MARK.

01 08 51 12 CMP Okay. Okay. Next?

01 08 51 21 LMP The next one is 20 seconds.

01 08 51 23 CMP All right. You ready?

01 08 51 25 LMP Definitely.

01 08 51 26 CMP MARK.

01 08 51 42 LMP Stand by.

01 08 51 43 CMP Okay.

01 08 51 46 LMP MARK.

01 08 51 47 CMP Okay.

01 08 51 48 LMP Okay, tell me when you're ready. The next one's 5 seconds.

01 08 51 51 CMP Okay. I'm ready.

[REDACTED]

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Day 2

01 08 51 53 LMP Yes.

01 08 51 54 CMP MARK.

01 08 51 55 LMP Okay. Stand by.

01 08 51 59 LMP MARK.

01 08 52 00 CMP Okay.

01 08 52 01 LMP Your next one's 1 second.

01 08 52 02 CMP Okay. Okay.

01 08 52 08 LMP Okay. Then you change to 24 frames per second.

01 08 52 11 CMP Okay.

01 08 52 12 LMP And 1/500th of a second.

01 08 52 16 CMP Okay.

01 08 52 17 LMP Then run the DAC for 2 seconds.

01 08 52 20 CMP Okay. Done.

01 08 52 22 LMP Okay. Enable jets.

01 08 52 25 CDR Okay. Coming on; A-3, Charlie 4, Bravo 3, and Delta 4.

01 08 52 32 LMP Okay. Record the MAG - percentage. Al, did we use 5 percent?

01 08 52 38 CMP Yes, we didn't use any more than that.

01 08 52 40 CDR Select attitude, Jim.

01 08 52 41 LMP Okay. VERB 49 maneuver to the UV photos. ... load them.

01 08 52 51 CDR Okay. Go ahead.

01 08 52 54 LMP Okay. 150, 052, and 033.

01 08 53 06 CDR 150, 052, and 033.

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[REDACTED]

01 08 53 12 LMP We maneuvering?

01 08 53 16 CDR What did you get on percentage on the MAGs, Al?

01 08 53 38 LMP Al, percentage on the MAGs.

01 08 53 40 CMP Well. It looks to me like it's about - we started out at about 95 percent and we're down to about 90 percent.

01 08 53 49 LMP Okay.

01 08 53 59 CDR ... take this ...

01 08 54 09 CMP Okay. I'm going to put some of those cameras away here. We don't need the pictures any more here, right?

01 08 54 13 LMP No.

01 08 54 14 CMP Okay, Dave. Dave, you want to - stash that just for now, and -

01 08 54 19 CDR Yes.

01 08 54 21 LMP Still be one more left.

01 08 54 23 CDR Oh, it'll be a long time.

01 08 54 24 CMP Yes.

TIME SKIP

01 09 43 05 CMP Okay. Here it is. Jettison, Jim.

01 09 43 12 LMP I've got the drogue here, Al, if you can get the TV between my legs.

01 09 43 19 CMP Okay.

01 09 43 24 CDR I got the probe, Jim. Let's see, you take the jettison bag. I want to put the probe over here by the hatch.

01 09 43 32 LMP Okay, I've got the JETT bag.

[REDACTED]

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Day 2

01 09 43 40 CC 15, Houston. We'd like to have NARROW BEAM, please.

01 09 43 48 CDR Tell them NARROW BEAM.

01 09 43 50 CMP Okay, Karl. You got NARROW.

01 09 43 54 CC Thank you.

01 09 43 58 LMP We go over there yet?

01 09 44 01 CMP Just a second.

01 09 44 03 CDR Not yet, Jim. We're not going anywhere yet. There. Okay, now -

01 09 44 11 CMP Got them lashed down?

01 09 44 12 CDR Yes, lashed down.

01 09 44 13 CMP Okay.

01 09 44 14 CDR Now we need the drogue.

01 09 44 15 CMP Yes.

01 09 44 16 CDR It seems to me that - the best thing - Give Jim back that TV. I think we can probably put his drogue also under the couch.

01 09 44 28 CMP Under Jim's couch?

01 09 44 29 CDR Well, that's too crowded, but I think under - under here.

01 09 44 41 CDR Let's see how we might make out. Okay, watch your suit.

01 09 44 48 CMP Yes.

01 09 44 50 CDR Change ribbons.

01 09 44 52 LMP One moment here.

01 09 50 04 CMP Yes. Did you -

01 09 50 36 CDR You like AUTO? Or REACQ.

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[REDACTED]

01 09 50 42 CMP AUTO's fine for what we're doing.
01 09 50 46 CDR Okay, Houston, you should have the high gain now.
01 09 50 54 CC Roger, 15. Give us NARROW BEAM, please.
01 09 50 57 CDR NARROW.
01 09 51 12 CDR Anything over there, Jim?
01 09 51 24 CDR Okay, Houston. The LMP is in the LM.
01 09 51 30 CC Houston copies.

TIME SKIP

01 12 49 55 LMP ...
01 12 50 07 LMP Okay. Did you want me to continue checking? I figured after I - Stand by.
01 12 50 13 CDR Yes. I thought you checked them all, Jim. Sure. Check them all. Sure.
01 12 50 25 LMP I understand.
01 12 50 26 CDR Not yet.
01 12 50 32 LMP ... do this?
01 12 50 33 CDR Okay. TV.
01 12 50 38 LMP ...
01 12 51 09 LMP ... That's over ...
01 12 51 12 CDR Yes, when I read it out to you. Not before.
01 12 51 17 LMP ...
01 12 51 54 CDR Oh, yes.
01 12 51 58 LMP Okay, Karl. I've checked all the circuit breakers, and that's the only one that seems to be out of configuration.

[REDACTED]

~~CONFIDENTIAL~~

01 12 52 43 LMP Okay, we're standing by.

01 12 52 57 LMP Yes, that's corrected.

01 12 53 02 CMP Yaw - our yaw is really ***

01 12 53 08 LMP Yes, we're in TRACK, AUTO.

01 12 53 12 CMP The yaw is ***

01 12 53 14 CDR Just let it go for a while. It's black and it's black and it's black.

01 12 53 23 LMP PITCH is minus 30, YAW is 270, and track is AUTO.

01 12 53 41 CDR ... 280.

01 12 53 42 LMP You can stop that one someplace.

01 12 53 44 CDR Okay.

01 12 54 10 LMP Okay. And right now the yaw indicator is reading about 280.

01 12 54 21 CDR Yes.

01 12 54 25 LMP The dial is 280. The thumbwheel is 270.

01 12 54 41 CMP ...

01 12 54 44 LMP Yes, go ahead.

01 12 54 47 CDR ... try to talk crazy.

01 12 56 13 CDR This is 15; I read you loud and clear.

01 12 56 22 CDR Well, nothing, other than that the pitch went to zero, and the yaw decreased just very slightly. And, of course, when you reacquired, why, I think only the pitch went back to 30.

01 12 56 35 LMP That's right. ...

01 12 56 36 CMP Take this here. ...

01 12 56 39 CDR Get it off?

~~CONFIDENTIAL~~

[REDACTED]

01 12 56 41 CMP Yes, I ... turn this PRD in.

01 12 56 49 CDR Get the PRD out of there while you're at it.

01 12 56 51 CMP Out of - where is it?

01 12 56 53 CDR It's in the pocket with yours. ... It's in your cuff - by your - top of your right hand. Ah, I got it.

01 12 57 01 CMP Oh, okay. ...

01 12 57 07 CDR Is this pad you copied down, Al, is that - the next midcourse, huh?

01 12 57 10 CMP No. That's a flyby pad.

[REDACTED]

[REDACTED]

[REDACTED]

DAY 3

02 07 40 01 SC (Laughter)

02 07 40 03 CDR Okay, Jim. How do you cycle those?

02 07 40 05 SC (Laughter)

02 07 40 06 CDR Okay. MAP CAMERA on to ON for 2 minutes and then OFF, and I'll set the camera.

02 07 40 10 LMP Okay. We're going to ON -

02 07 40 11 CDR Okay.

02 07 40 12 LMP MARK.

02 07 40 13 CDR The clock is running. PAN CAMERA SELF TEST to on (up). Talkback barber pole, to five frames, and then gray.

02 07 40 21 LMP Okay. SELF TEST.

02 07 40 24 CDR And then five. Then you do five frames.

02 07 40 26 LMP Okay.

02 07 40 27 CMP ... he doesn't. I think you - you'll - you'll see at 5 - about 5 seconds - and then gray.

02 07 40 34 CDR Okay. Is it gray?

02 07 40 36 LMP Not yet.

02 07 40 53 CDR Still not gray?

02 07 40 55 LMP No.

02 07 41 00 CDR It is barber pole?

02 07 41 01 LMP Yes, it's barber pole.

02 07 41 02 CDR Did it go barber pole when you put it - put it on?

02 07 41 04 LMP Yes.

02 07 41 05 CMP ...

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02 07 41 07 CDR Oh, I see, Al. It does five frames automatically, and then it automatically goes gray.

02 07 41 09 CMP Yes.

02 07 41 10 LMP Okay. It's gray.

02 07 41 12 CDR Good. PAN CAMERA SELF TEST to HEATERS.

02 07 41 15 CMP We still don't know whether it - what - anything about the craters.

02 07 41 18 LMP Okay, PAN CAMERA SELF TEST going to HEATERS.

02 07 41 20 CDR PAN CAMERA POWER to OFF.

02 07 41 22 LMP PAN CAMERA POWER, OFF.

02 07 41 25 CDR Okay. After mapping camera - Oh, wait a minute. Stand by for the bell.

02 07 41 30 LMP Okay.

02 07 41 32 CDR And when the bell rings, you want to go MAPPING CAMERA to OFF.

02 07 41 36 LMP Okay.

02 07 41 45 CDR Oh, boy.

02 07 41 55 LMP Too bad they didn't put this panel over on Al's side.

02 07 41 59 CDR I think it'd been a lot easier for him during the flight - or during the - -

02 07 42 01 LMP Yes.

02 07 42 02 CDR - - solo time, too.

02 07 42 03 LMP Yes. Yes, it would have, too.

02 07 42 06 CDR Probably didn't have the wiring.

02 07 42 08 LMP Didn't have any room for it ...

02 07 42 10 CDR Well, they probably - the wire ... probably were all built for this, you know.

CONFIDENTIAL

[REDACTED]

02 07 42 16 CDR Yup, yup. There you go.

02 07 42 17 LMP Okay, MAPPING CAMERA going OFF.

02 07 42 19 CDR MAP CAMERA, OFF. Okay, and then for 1 minute, we time the MAPPING CAMERA, OFF. And after it's been OFF for 1 minute, MAP CAMERA goes - the MAP CAMERA, ON, goes to STANDBY, and we should get a gray talk-back. And the clock is running.

02 07 42 43 CDR You have another 49 maneuver, or you want to recoup -

02 07 42 46 CMP ... that other ... 49 maneuver ... again.

02 07 42 48 CDR Oh, oh, it says - Well, you get the idea that the - Let's see - it says secure the high gain antenna.

02 07 42 56 CMP Yes.

02 07 42 57 CDR So why don't we wait?

02 07 43 21 CDR Okay, Jim. MAP CAMERA, ON, to STANDBY.

02 07 43 24 LMP Verified.

02 07 43 25 CDR Talkback gray.

02 07 43 26 LMP Verified.

02 07 43 27 CDR Okay.

02 07 43 30 CDR Houston, Apollo 15. That completes the man [sic] and pap [sic] camera operation. And, if you approve, we'll secure the high gain and maneuver to the UV attitude.

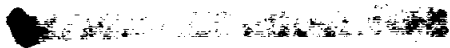
02 07 43 46 CMP Nothing like rubbing it in. (Laughter)

02 07 43 55 CDR Okay. On the way. Thank you.

02 07 43 56 CMP What's the attitude there, Jim?

02 07 43 59 LMP Uh - -

[REDACTED]



DAY 4

03 06 30 22 LMP - - with a ... Minus 35.

03 06 30 25 CDR Roger.

03 06 30 27 LMP You guys got all your oxygen?

03 06 30 30 CDR Yes.

03 06 30 31 LMP Okay.

03 06 30 33 CMP Minus 5 and a PRO, and a DELTA-V thrust of plus 5 ...
Okay. PILOT VALVE, open. Everything else looks good.

03 06 30 47 CMP/CDR One minute.

03 06 30 59 CMP Okay. We've got ... here.

03 06 31 13 CMP Average g is on.

03 06 31 19 LMP EMS MODE, NORMAL.

03 06 31 20 CDR EMS MODE's on.

03 06 31 27 CMP And we settle down for the DELTA-V thrust.

03 06 31 29 CDR Yes.

03 06 31 33 CMP Sit back and ... - -

03 06 31 34 CDR Looks good.

03 06 31 38 CMP Clear to PRO.

03 06 31 39 CDR Okay. 99 PRO. Ought to be okay.

03 06 31 44 CMP And the DELTA-V THRUST is on.

03 06 31 46 CDR Okay.

03 06 31 47 CMP B valves.

03 06 31 48 CDR IGNITION. 1 - -

03 06 31 49 CMP IGNITION.

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Day 4

03 06 31 50 CDR - - 2, 3, 4, 5 - -

03 06 31 53 CMP A's coming on. Okay - -

03 06 31 54 CDR - - ... there.

03 06 31 55 CMP - - A valves. P_C is reading about 90.

03 06 31 59 CDR Okay.

03 06 32 01 CMP Looks like it's running smooth.

03 06 32 02 CDR ... Okay. The EMS and the DELTA-V and the DSKY look good. And we have tight limits. Very smooth.

03 06 32 35 CDR Okay, the DSKY and EMS look good. Still in the tight limits.

03 06 32 51 CDR A minute, and you're tracking PITCH 41.

03 06 32 56 CMP Hmm! Right on, huh? Okay, the pressure's running 95; holding steady.

03 06 33 05 CDR Okay. Keep going on tight limits.

03 06 33 17 CDR The DSKY and the EMS agree. ... watch for the loose limits?

03 06 33 24 CMP Yes. I should be able to ... loose limits.

03 06 33 27 CDR Okay.

03 06 33 30 LMP Five degrees, Dave. And the balance - unbalance is holding very well. About minus 180.

03 06 33 35 CMP Right on the center of the roll dead band.

03 06 33 37 CDR Dead on it - right on the side of the roll.

03 06 33 39 CMP ... on the roll.

03 06 33 40 CDR Not even on the side. It's only at 4 degrees.

03 06 33 51 CMP We have a PITCH 34. It'll probably stretch out after we go to the single bank insertion.

03 06 33 57 CDR Yes.

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[REDACTED]

03 06 33 59 CMP Any ... loose limits?

03 06 34 03 CDR DSKY and EMS agree pretty well.

03 06 34 15 CMP The DSKY and the EMS are about 12 feet per second difference - is all. That's pretty good.

03 06 34 21 CDR Mm-hmm.

03 06 34 23 CMP ... still no loose limits?

03 06 34 30 CDR That view meter's not even registering.

03 06 34 50 CMP Did you get your watch started on time, Jimmer?

03 06 34 52 LMP We'll find out.

03 06 34 54 CMP No, I mean, did you?

03 06 34 55 LMP Yes.

03 06 34 57 CMP Okay, because we need you to tell us at 6 minutes.

03 06 34 59 LMP Yes, I will.

03 06 35 03 CDR How are the pressures looking over there, Jim?

03 06 35 04 LMP Beautiful. About 170 on both.

03 06 35 08 CDR Okay.

03 06 35 09 CMP ... about 18?

03 06 35 10 CDR No, we're about 12 - -

03 06 35 11 LMP P_C is reading 95 and holding steady.

03 06 35 13 CMP Are we 12 feet per second - - difference between the EMS and DELTA-V?

03 06 35 18 CDR Somebody would chew his ass if it didn't.

03 06 35 22 LMP P_C is creeping up just a little bit.

03 06 35 25 CMP Okay, we're tracking PITCH 33.

03 06 35 34 CDR Okay. Should be approaching the tight limits, Jim.

[REDACTED]

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03 06 35 48 LMP Okay, you're in tight limits now. About 2 and a half minutes to go.

03 06 35 51 CDR Okay. We're looking good here.

03 06 35 55 LMP Okay.

03 06 35 56 CMP P_C's about to cross over.

03 06 35 57 LMP P_C's holding about 90 - 96.

03 06 36 00 CMP Okay, we've had cross over.

03 06 36 02 CDR Okay.

03 06 36 03 CMP It crossed a little, but not much.

03 06 36 05 LMP Hey, listen. Your P_C went up about 2 - about - 2 percent, and it's up to about 98 now.

03 06 36 13 CDR Okay, the EMS and the DSKY are about 10 feet per second difference. We're at tight limits. About 2 minutes to go. G&N's tracking 638.

03 06 36 29 CMP Okay.

03 06 36 48 LMP Five minutes.

03 06 36 50 CDR Okay. EMS and the DSKY are within about 10 feet per second. Track at 638. Tight limits.

03 06 37 03 CMP Okay. Give me a countdown at 6 minutes.

03 06 37 06 LMP Okay.

03 06 37 09 CDR You want Jim to count down at 6 minutes?

03 06 37 10 CMP Yes.

03 06 37 11 LMP You want me to give you a 10-second count?

03 06 37 13 CMP Yes.

03 06 37 14 LMP Okay.

03 06 37 24 CMP A little dead band in there in the roll?

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[REDACTED]

03 06 37 26 CDR Mnhmm.

03 06 37 28 CMP Okay, about 10 feet per second difference between the EMS and the DSKY, and we're looking good.

03 06 37 33 CDR P_C's varying between about 96 and 98. Looking good though!

03 06 37 37 LMP Countdown. 10, 9, 8, 7, 6, 5, 4, 3, 2, 1 -

03 06 37 47 LMP 6 minutes.

03 06 37 48 CDR Okay.

03 06 37 49 CMP Can you reach it?

03 06 37 51 CDR PILOT VALVE A is out. P_C is down to 94.

03 06 37 54 CMP Okay, we'll need another countdown to the -

03 06 37 56 CDR Yes.

03 06 37 57 CMP Shutdown then.

03 06 37 58 CDR Yes.

03 06 38 00 CMP Okay. Can you reach them there, Dave?

03 06 38 01 CDR Yes. About 20 seconds to go.

03 06 38 06 CMP You've got 10 seconds overburn, don't forget.

03 06 38 08 CDR Yes.

03 06 38 15 LMP Start the countdown?

03 06 38 17 CDR Yes, looks good.

03 06 38 19 LMP 10, 9, 8, 7, 6, 5, 4, 3, 2 -

03 06 38 27 CDR SHUTDOWN.

03 06 38 28 CMP Okay.

03 06 38 29 CDR Automatic. Okay, Jim.

03 06 38 32 LMP Okay - -

[REDACTED]

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03 06 38 33 CMP Oh, we log zero!

03 06 38 34 CDR Look at that.

03 06 38 35 CMP We'll burn them.

03 06 38 36 CDR - - ... Look at that, pal!

03 06 38 37 LMP Did you - -

03 06 38 38 CMP Oh, I didn't - -

03 06 38 39 CDR (Laughter)

03 06 38 40 LMP Ohh!

03 06 38 41 CMP - - dream any - -

03 06 38 42 CDR Look at that!

03 06 38 43 CMP Jim, Jim. Let's clean it up, Jim.

03 06 38 44 LMP Okay -

03 06 38 45 CDR But whoo.

03 06 38 46 LMP Stand by for gimbal motors, Al.

03 06 38 47 CDR Fantastic!

03 06 38 51 LMP Stand by for gimbal motors.

03 06 38 52 CMP I thought I just gave you one.

03 06 38 53 LMP I don't see it.

03 06 38 54 CMP I'll try it again. All right, number one coming off.

03 06 38 59 LMP One, two - -

03 06 39 02 CMP Two's -

03 06 39 04 LMP - - three, four. Okay. TVC SERVO POWER 1 and 2, OFF.

03 06 39 09 CMP OFF.

03 06 39 11 LMP MAIN BUS TIE's coming OFF.

03 06 39 12 CDR I can't believe it! I can't believe it!

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[REDACTED]

03 06 39 16 LMP Yes, sir, that was beautiful.

03 06 39 17 CDR That was fantastic!

03 06 39 18 LMP That was beautiful.

03 06 39 20 CDR That is the best burn I've ever seen and I've seen 10, I mean 11. That isn't real! I've never seen one come out that good.

03 06 39 29 LMP Well, that's just superior cunning and skill, men.

03 06 39 31 CDR Yes. It's got to be. Certainly (laughter).

03 06 39 35 CMP Okay, Jim. Clean up the rest.

03 06 39 37 LMP Okay, you got all the data? Got the EMS data?

03 06 39 41 CMP Yes, got that.

03 06 39 42 LMP EMS FUNCTION's OFF.

03 06 39 43 CMP Okay, OFF.

03 06 39 44 LMP EMS MODE to STANDBY.

03 06 39 45 CMP STANDBY.

03 06 39 46 LMP RHC and THC; locked.

03 06 39 48 CMP Locked.

03 06 39 49 LMP DEADBAND, MAX.

03 06 39 50 CMP MAX.

03 06 39 51 LMP TRANSLATION CONTROL POWER, OFF.

03 06 39 52 CMP OFF.

03 06 39 53 LMP ROT CONTROL POWER DIRECT, two, OFF.

03 06 39 54 CMP DIRECT's OFF.

03 06 39 55 LMP BMAG MODE, three, RATE 2.

03 06 39 56 CMP RATE 2.

[REDACTED]

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03 06 39 57 LMP CB DIRECT ULLAGE, two, open.
03 06 39 59 CMP DIRECT ULLAGE, open.
03 06 40 00 LMP CB SPS PITCH 1 and YAW 1, open.
03 06 40 03 CMP PITCH 1, YAW 1, open.
03 06 40 05 LMP SPS PILOT VALVE MAIN B, open.
03 06 40 07 CMP MAIN B, open.
03 06 40 08 LMP PCM BIT RATE going LOW.

TIME SKIP

03 08 13 49 CDR - - says it's just ... - He got word from the back room that Farouk and his boys are ecstatic. And the SIM bay stuff is all working very well.

03 08 14 06 CDR (Laughter) Good old SIM bay working up in there and he's jumping up and down. Well, the tape motion is going as planned. Even a little early. Okay.

03 08 14 36 CDR ...? No, I don't think we have time then ... have to get that ... in. ...? You'll spoil the eat period by messing with the -

03 08 14 54 CDR Okay, 10 minutes before the dump, Jim.

03 08 15 14 CDR Man, is that full.


03 08 15 20 LMP ... DOI.

03 08 15 37 CMP Hopefully, DOI is just going to be a bank B burn. Is that right?

03 08 15 41 LMP ...

03 08 16 13 CDR Houston, Apollo 15; go.

03 08 16 32 CDR Okay. Three photos - You son of a ... bitch! He always stops.

03 08 16 56 CDR I'm going to give Karl about 6 seconds every time, before I answer 

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03 08 17 00 CDR Okay, Houston, understand. Swirls on Crisium, three-photo - photo convergent stereo, f/8, 1/250th, with the 250.

03 08 17 24 CDR Okay. We'll tell him. You wanted to be reminded about helmets and gloves as you take your shots of Ingenuity on this time. What the hell does that mean?

03 08 17 42 CDR Okay, thank you, Karl. We will. Huh? See around what ... problem? Oh.

03 08 17 54 CDR Rather than the glasses? Yes.

03 08 18 29 CDR ... we going to start running our clock ... then at the 180-degree point, too, don't we?

03 08 18 45 CDR Yes.

03 08 19 42 LMP ... much time is up ...

02 08 19 46 CDR No. Not yet.

03 08 20 00 CDR These 250's I guess you take with the brackets, huh? Yes? Out of which window? Center window?

03 08 20 17 CDR You got a bunch of other ones here. This one's a 33 frames at 15-second intervals. All - all this 250 stuff is - -

03 08 20 29 CDR Yes. Okay. That's right. That's right. You asked why you brought that bracket along once, didn't you?

03 08 21 08 CMP Just push that button underneath it, Dave.

03 08 21 11 CDR Oh. There's a ... Look at that.

03 08 21 23 CMP ...

03 08 21 25 LMP Anyone else have a jumney [?] bag they want dumped?

03 08 21 31 CDR No.

03 08 21 49 CDR 1/250th.

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Day 4

03 08 21 53 CMP 250's already rolling.

03 08 22 23 CMP You guys want anything to eat?

03 08 22 39 CDR What?

03 08 22 40 CMP ...

03 08 22 42 CDR Yes. Eighty-five pictures, MAG M, frame number 30 which would be frame number 43.

03 08 22 57 LMP Hey, I think I shorted someone a lemon pudding. A lemon pudding.

03 08 23 02 CDR I've got one.

03 08 23 03 LMP I don't think Al has. I've got one over here opened - that Al can have.

03 08 23 10 CDR I've - I've got one in my pocket I'm going to eat. You want this one?

03 08 23 11 LMP ...

03 08 23 13 CDR ... And let's don't be hanging stuff up now because we've got another burn coming.

03 08 23 23 LMP Yes.

03 08 23 24 CDR Let's get it all taken care of.

03 08 23 31 LMP Huh? I ate mine.

03 08 23 34 CDR Then you opened another one, huh?

03 08 23 37 LMP I thought I had the - the fruit cocktail. Here, throw that in the bag. Thank you.

03 08 23 49 CDR Well, can we get the - we got to - when we get through all that stuff this evening, let's get all the garbage and take it down to the food locker.

03 08 24 00 LMP Yes. It's time to dump, isn't it?

03 08 24 03 CDR Yes. I expect it is. That's all right, we'll close.

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[REDACTED]

03 08 24 09 LMP Can I dump?

03 08 24 11 CDR Yes.

03 08 24 13 LMP Okay.

03 08 24 17 CDR Dump the waste, too.

03 08 24 31 LMP Dumped that ... dead band.

03 08 24 34 CDR The dump?

03 08 24 56 CDR ... (laughter).

03 08 25 17 CDR Hey, you got coming up - Sea of Ingenuity, Crisium, Keyhole Crater, The Bright One, and Ibn Yunus - ...

03 08 25 47 CDR That's - Oh, yes. There's a possibility of 10. And - then you do the realine. You got a lot of pictures to take. Wh - where do you want to take them?

03 08 26 03 CDR Okay. Why don't you just tell us, you know, which window, and we'll go to wherever -

03 08 26 15 CDR Oh, okay.

03 08 26 27 CDR ... five.

03 08 28 01 CMP Dave, did you say you're doing a waste water dump now?

03 08 28 03 CDR Yes.

03 08 28 20 CMP No, I've got another ... for that.

03 08 28 23 CDR I thought there was one here.

03 08 28 28 CMP I think you was going to put it on the Flight Plan. Okay. There's one here, Dave.

03 08 29 25 CDR ... that waste water's something that's got to go. Certainly have a lot of it.

03 08 29 34 LMP It's probably done.

03 08 29 35 CDR Huh?

[REDACTED]

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Day 4

03 08 29 36 LMP It's probably done.

03 08 29 37 CDR What - -

03 08 29 38 LMP How can you tell?

03 08 29 39 CDR It's slow.

03 08 29 40 LMP Oh, I see. The waste water dump.

03 08 29 41 CDR Yes.

03 08 30 03 CDR ... a small ...

03 08 30 40 CDR Got a lots of things to dump?

03 08 30 46 LMP Here, I'll put that in the bag, Al.

03 08 31 00 CMP There it is. You got it?

03 08 31 48 LMP Okay, the urine dump's complete.

03 08 31 50 CDR Oh, really? All that stuff?

03 08 31 55 LMP ... Yes.

03 08 32 59 CMP Okay.

03 08 33 04 LMP What'd you have the timer set up for, Dave?

03 08 33 07 CDR Waste water dump. To make sure I checked it when it went off.

03 08 33 12 LMP You dumping down to 15?

03 08 33 14 CDR Yes. You might just watch it if you're there.
... Al's moving over.

03 08 33 29 LMP He's ... of you.

03 08 33 32 CDR Yes. Time to look for more. ...

03 08 34 01 CDR Jim, you see my scissors up there?

03 08 34 03 LMP Yes.

03 08 34 06 CDR Thank you.

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03 08 34 16 CDR That looks good.

03 08 34 19 LMP We got sunrise. Coming up on sunrise. Yes. Oh, gee. That's bright.

03 08 34 32 CMP See, you can just barely see the horizon.

03 08 35 14 LMP See the horizon out there, see it?

03 08 35 15 CDR Oh, look at that. Isn't that something! Hey, you got to take a picture of that.

03 08 35 24 CDR Huh? Isn't that something? Oh, boy.

03 08 35 37 CDR Golly!

03 08 35 50 LMP Okay. Believe that waste water dump's done. I'll go down and get it.

03 08 35 53 CDR I'll get it. I'm right here.

03 08 35 54 LMP Okay. ... down to 20.

03 08 35 56 CDR Okay. Yes.

03 08 36 06 LMP Yes. It looks like a snow-covered prairie. And doesn't that look like a brown to you?

03 08 36 14 CDR Now it does. Yes. Hey, that's - just got to have a picture of that.

03 08 36 25 LMP Okay.

03 08 36 32 LMP Wouldn't that make a great Christmas card?

03 08 36 34 CDR Hey, wouldn't it, though?

03 08 36 35 LMP Yes, that view right from this window. Look at that.

03 08 36 40 CDR Yes, it's almost the same over here. Huh? Where's - I can't hear you, Al.

03 08 36 49 LMP Ring sight.

03 08 36 50 CDR Yes, there's one - the only one I know of right now - I can get you one. I know where there's one. There's a ridge here, Jim. A prominent

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ridge - we're coming across. That's just absolutely striking. I don't believe it. Ring sight. Yes.

03 08 37 40 CDR No, I can't get to it now, Al. Buried. Too much junk. Hey, Al, use the - edge - the - the corner of the camera. Let me show you. Let me show you how to aim that thing so you hit. See this thing? See? Right along this edge here. Line that up. Just take all the parallax out and line that up, and it's a straight shot.

03 08 38 23 CDR Hey, Jim, is the waste water stopped?

03 08 38 26 LMP Yes, I turned the dump off.

03 08 38 28 CDR You did?

03 08 38 29 LMP Yes.

03 08 38 30 CDR So did I. How could you have turned - -

03 08 38 34 LMP No. Oh, I'm sorry. The urine dump.

03 08 38 36 CDR You - you're not lis - -

03 08 38 37 LMP Oh - Oh, okay. Waste water - -

03 08 38 39 CDR Yes. You're not paying attention to me again, Jim.

03 08 38 41 LMP - - 25 percent.

03 08 38 44 CDR Okay.

03 08 38 46 LMP He closed it.

03 08 38 47 CDR You're right. Yes.

03 08 38 48 LMP You wanted me to confirm that it had been closed.

03 08 38 49 CDR Yes, right.

03 08 38 50 LMP I don't see a drop anymore.

03 08 38 52 CDR ...

03 08 38 53 LMP Okay. ...

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03 08 39 02 CDR Huh?

03 08 39 04 LMP Can't see that ridge you were talking about, Dave.

03 08 39 06 CDR You're going across it. Right where the terminator comes out. No, that's the horizon. Okay. I'm ... Yes.

03 08 39 30 LMP Isn't that a good boy, Al?

03 08 41 16 CDR Hey, Jim, here's this little vent.

03 08 41 19 LMP Okay.

03 08 42 46 CDR Yes.

03 08 43 06 CMP Jim, I don't see ...

03 08 43 44 CMP I see. That's - Ingenuity over there on the -

03 08 43 58 CDR Hey, Jim, what did you do with those tissues that were over here? Remember?

03 08 44 03 LMP I didn't use any of them, Dave.

03 08 44 05 CDR No, but - there wasn't any of those little - -

03 08 44 08 LMP Those medium ...?

03 08 44 29 CDR What?

03 08 44 44 CDR The very subdued rille that runs aro - perpendicu- lar to the mountain? Oh, I see what you mean. Along the edge of the - Is that on the edge of ...? Of Ingenuity, huh?

03 08 45 22 CDR I can keep you posted here about - You take - you take photos until about 49 here.

03 08 46 00 LMP This must be Gagarin coming up.

03 08 46 05 CDR Yes.

03 08 46 08 LMP Think I have better luck holding the map backwards.

03 08 48 41 LMP That's Gagarin we're over, huh?

~~CONFIDENTIAL~~

03 08 48 57 CDR Do you know what Keyhole looks like? Geez. That's the kind of thing that would be good to explore.

03 08 49 17 CDR There's that neat one with the very white ejecta pattern - out at 1 o'clock.

03 08 49 54 LMP Do you want to ... the window?

03 08 50 05 SC ...

03 08 50 07 LMP Yes.

03 08 50 11 LMP I think we better get this - all the windows down.

03 08 50 14 CDR Yes. I think we better leave. You know you don't have to get them all, Al. ...

03 08 51 21 CDR Oh, yes.

03 08 51 54 LMP ... might be AUTO.

03 08 52 25 CDR Hey, Jim?

03 08 52 26 LMP Yes.

03 08 52 27 CDR You got your sunglasses?

03 08 52 36 LMP Not quite, Al. Did you just pass me some sunglasses, Dave?

03 08 52 45 CDR Yes.

03 08 52 47 LMP Okay.

03 08 52 48 CDR I think they're yours. Aren't they?

03 08 52 50 LMP Yes.

03 08 53 47 LMP You can see that - see the canyons on it?

03 08 54 10 CDR Find Keyhole, Al? Good.

03 08 54 18 LMP What's distinctive about Keyhole?

03 08 54 29 LMP Oh, really?

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[REDACTED]

03 08 55 43 LMP I can sure see a lot - lot of blocks around this one coming up. A lot of blocks on the rim. And a slump on the - the west side of it.

03 08 56 39 LMP Okay, the next one is target number 7, Al. It's The Bright One.

03 08 56 50 LMP That's -

03 08 57 03 LMP The one with slump blocks in the center of it?

03 08 57 18 LMP The one we're just coming up on, huh?

03 08 57 21 CMP Yes. That's it. Yes, that's Dooze [?]. Bright One. Yes, that's the one we want to get a - complete - We want two pictures of the ejecta pattern all the way along through there.

03 08 57 57 (Camera click)

03 08 58 12 CDR Yes, there's King over there.

03 08 58 32 CDR Hey, Jim?

03 08 58 33 LMP Yes.

03 08 58 35 CDR Hey, Jim, ... take care of that little map. That's the only one we got - you and I.

03 08 58 38 LMP Yes, I understand.

03 08 58 40 CDR Take good care of it.

03 08 58 45 LMP No, we have another set - Well, the only one of the little ones. Yes, you're right. Don't ask for ..., huh?

03 08 58 51 CMP By golly, old Bright Crater is a bright one, too. It's got good ray pattern. Glass all over.

03 08 59 00 (Camera click)

03 08 59 17 (Camera click)

03 08 59 22 (Camera click)

03 08 59 25 (Camera click)

[REDACTED]

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03 08 59 50 LMP Geesh.

03 08 59 52 (Camera click)

03 08 59 57 (Camera click)

03 09 00 11 (Camera click)

03 09 00 18 LMP O₂ FLOW HIGH.

03 09 00 37 (Camera click)

03 09 00 40 (Camera click)

03 09 02 00 CMP Okay, let's see. Let's try to get this Rooster Tail.

03 09 02 07 LMP The next target you have is Ibn Yunus.

03 09 02 10 CMP Yes, but I'm going to try and see if I can get a shot of the Rooster Tail here if I can.

03 09 02 20 CMP That won't go anywhere.

03 09 02 51 CDR ...

03 09 03 05 CMP You what, Jim?

03 09 03 07 LMP ... Ibn Yunus ought to be coming up on the left side here shortly.

03 09 03 12 CMP Yes. Should be.

03 09 03 15 LMP Oh, look at the Earth come up - earthrise. ... all day, we ought to look at that ...

03 09 03 20 CDR Oh, yes.

03 09 03 27 CMP ... you don't ...

03 09 03 29 CDR Yes.

03 09 03 32 LMP Golly.

03 09 03 33 CMP That ought to be good for a picture, huh?

03 09 03 35 CDR Oh, yes. Be better when you're ...

03 09 03 38 CMP Yes. I got part of the IM in the way there.

CONFIDENTIAL

[REDACTED]

03 09 03 54 CMP Let me see here - let me - Yell if you see the Rooster Tail.

03 09 04 00 LMP I'm not sure what the Rooster Tail looks like, Al.

03 09 04 02 CMP That's that little secluded - dome on a - on a ca - on a small crater that Farouk was showing us the other day.

03 09 04 14 LMP Yes, I think there's one - -

03 09 04 15 CMP That a - -

03 09 04 16 LMP - - coming up here - that -

03 09 04 18 CMP It should be quite obvious if you see it.

03 09 04 21 LMP Well, there's kind of an occluded area to the west.

03 09 04 22 CMP It looks - it looks very much like a rooster tail.

03 09 04 28 CDR ...

03 09 04 30 CMP Yes.

03 09 04 32 LMP See the one coming up, Dave, ... in the occluded area - to the west?

03 09 04 38 CDR Is that the one ...

03 09 04 41 CMP Yes, I think it's very fresh.

03 09 04 49 LMP Should it be right on track?

03 09 04 52 CMP Yes. Right underneath.

03 09 04 56 LMP ... There's one underneath us. Big rille and ...

03 09 05 14 CDR Could that be it - the one we're just coming up on, Al?

03 09 05 22 CMP Yes. That's it. Must be it.

03 09 05 39 CMP ... a shot of it here.

03 09 05 49 CMP Yes.

03 09 06 06 CMP There's Babcock out there.

[REDACTED]

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03 09 06 08 CDR Hey, Al, can I do a VERB 64 in this P20 or will it kick it back out?

03 09 06 12 CMP No. It'll keep it in.

03 09 06 14 CDR Maybe I ought to get up there and do one ...

03 09 06 17 CMP Yes. It should. It should work.

03 09 06 21 CDR ...

03 09 06 24 CMP Fifteen and 12.

03 09 06 25 CDR Fifteen and 12?

03 09 06 27 CMP Uh-huh.

TIME SKIP

03 10 27 20 CDR Okay. We were up to ...

03 10 27 26 LMP ... do that. ...

03 10 27 34 LMP Getting hungry, Al?

03 10 27 36 CMP Huh?

03 10 27 38 LMP ... seemed like the day was getting along.

03 10 27 42 CMP We've only got 12 minutes to the burn.

03 10 27 45 LMP Okay. ...

03 10 27 49 CDR Okay, that's right. We're at 12 minutes.

03 10 28 03 LMP ...

03 10 28 06 CDR Do you feel all right? You okay?

03 10 28 09 LMP ... spacecraft roll ...

03 10 28 13 CDR Okay. ... it up to 10 degrees; ... to zero.

03 10 28 55 LMP ...

03 10 29 00 CMP ... 8.

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03 10 29 02 LMP ... burn ...

03 10 29 03 CMP 159.

03 10 29 05 LMP ... junk.

03 10 29 13 CMP Yes. You're right. Why don't you ... These are yours.

03 10 29 33 LMP ... steady this ...

03 10 29 35 CDR No.

03 10 29 58 LMP How much time we got before the burn - 10 minutes?

03 10 30 01 CDR Ten minutes.

03 10 30 02 CMP Nine minutes.

03 10 30 04 CDR Okay. GDC's alined.

03 10 30 07 LMP Do you want to call P40? ...?

03 10 30 11 CDR Okay. P40.

03 10 30 22 LMP Okay. BMAG MODE, three, to RATE 2.

03 10 30 26 CDR RATE 2.

03 10 30 28 LMP SPACECRAFT CONTROL, CMC, in AUTO.

03 10 30 30 CDR CMC, AUTO.

03 10 30 31 LMP PRO.

03 10 30 34 CDR Okay, we'll wait a little here. Maybe we ... - -

03 10 30 36 LMP You got roll aline?

03 10 30 37 CDR Yes. It's all alined. We're all ... - -

03 10 30 38 LMP GDC and roll? Okay. TVC check and prep. Circuit breakers STAB CONTROL SYSTEM, all closed on panel 8.

03 10 30 43 CDR Okay. ... going in. Okay?

03 10 30 49 LMP CB SPS. Should be ll closed.

CONFIDENTIAL

Day 4

03 10 30 53 CDR Okay, 11 closed; MAIN A is out.

03 10 30 55 LMP Okay. You got DELTA- V_C set.

03 10 30 58 CDR DELTA- V_C is set; 208.4.

03 10 31 01 LMP EMS FUNCTION, DELTA-V.

03 10 31 03 CDR DELTA-V.

03 10 31 05 LMP MAN ATT, three, to RATE COMMAND.

03 10 31 06 CDR RATE COMMAND.

03 10 31 07 LMP DEAD BAND, MIN.

03 10 31 08 CDR MIN.

03 10 31 09 LMP RATE, LOW.

03 10 31 10 CDR LOW.

03 10 31 11 LMP TRANSLATION CONTROL POWER, on.

03 10 31 12 CDR On.

03 10 31 13 LMP SCS TVC, two, to RATE COMMAND.

03 10 31 15 CDR SCS TVC to RATE COMMAND.

03 10 31 19 LMP DELTA- V_{CG} to LM/CSM.

03 10 31 20 CDR LM/CSM.

03 10 31 21 LMP TVC GIMBAL DRIVE, PITCH and YAW, to AUTO.

03 10 31 23 CDR AUTO.

03 10 31 24 LMP ... Okay. ...

03 10 31 28 CDR (Laughter) Going about it the hard way, maybe.

03 10 32 14 LMP Did you ...?

03 10 32 16 CDR Yes.

03 10 32 31 CMP ...?

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03 10 32 33 LMP Four jets and 15 seconds.

03 10 32 35 CDR Four jets, 15 seconds on the ullage. Okay.

03 10 32 43 CDR Coming up on 7 minutes.

03 10 32 50 CDR MARK; 7 minutes.

03 10 33 09 LMP ...

03 10 33 11 CDR Right. Well, we're not going to have any overburn.

03 10 33 25 CDR Okay, Jim. Coming up on 6 minutes.

03 10 33 27 LMP Okay.

03 10 33 28 CDR Start.

03 10 33 29 LMP MAIN BUS TIES coming on.

03 10 33 34 LMP TVC SERVO POWER 1, to AC 1/MAIN A; 2 to AC 2/MAIN B.

03 10 33 39 CDR 1 is AC 1/MAIN A and 2 is AC 2/MAIN B.

03 10 33 42 LMP ROT CONTROL POWER, NORMAL, two, to AC.

03 10 33 45 CDR ROT CONTROL POWER, two, NORMAL, AC.

03 10 33 47 LMP ROT CONTROL POWER DIRECT, two, OFF.

03 10 33 49 CDR DIRECT, two, OFF.

03 10 33 51 LMP BMAG MODE, three to ATT 1/RATE 2.

03 10 33 53 CDR BMAG MODE, three of them, to ATT 1/RATE 2.

03 10 33 56 LMP SPACECRAFT CONTROL, SCS.

03 10 33 57 CDR SCS.

03 10 33 59 LMP RHC number 2, armed.

03 10 34 01 CDR RHC number 2, armed.

03 10 34 03 LMP ... at 5.

03 10 34 06 CDR Okay.

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Day 4

03 10 34 32 CDR Okay. Let's go ahead.

03 10 34 33 LMP Okay. GIMBALS MOTORS PITCH 1 and YAW 1, on.

03 10 34 36 CDR Coming on.

03 10 34 38 LMP 1, 2.

03 10 34 41 CDR Okay.

03 10 34 42 LMP Verify trim control and set.

03 10 34 44 CDR Okay. Verify the trim and set at 1.68 and minus .55. Verified.

03 10 34 53 LMP Verify MTVC.

03 10 34 56 CDR MTVC.

03 10 35 06 CDR Verified.

03 10 35 07 LMP SPACECRAFT CONTROL, CMC.

03 10 35 08 CDR CMC.

03 10 35 09 LMP THC, clockwise. And verify no MTVC.

03 10 35 12 CDR Clockwise.

03 10 35 16 LMP Getting roll out of that.

03 10 35 19 CDR No MTVC.

03 10 35 20 LMP Secondary TVC check. GIMBAL MOTORS PITCH 2 and YAW 2, on.

03 10 35 24 CDR PITCH 2 and YAW 2 coming on.

03 10 35 26 LMP 2 - on. Set GPI trim.

03 10 35 36 CDR Okay.

03 10 35 37 LMP Verify MTVC.

03 10 35 43 CDR Verified.

03 10 35 44 LMP THC neutral. Verify no MTVC.

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03 10 35 48 CDR No MTVC.

03 10 35 49 LMP Verify GPI returns to zero, zero.

03 10 35 52 CDR Zero, zero.

03 10 35 53 LMP ROT CONTROL POWER, NORMAL, two, to AC/DC.

03 10 35 57 CDR AC/DC.

03 10 35 58 LMP ROT CONTROL POWER, DIRECT, two, to MAIN A/MAIN B.

03 10 36 01 CDR DIRECT, MAIN A/MAIN B.

03 10 36 02 LMP BMAG MODE, three, to RATE 2.

03 10 36 04 CDR BMAG MODE, three, to RATE 2.

03 10 36 06 LMP PRO. ...

03 10 36 08 CDR Okay. ...

03 10 36 18 LMP Okay?

03 10 36 20 CDR That's okay. Yes. Looks good.

03 10 36 22 LMP Okay. Next - -

03 10 36 23 CDR Okay?

03 10 36 24 LMP - - to BMAG MODE - -

03 10 36 25 CDR Ready?

03 10 36 26 LMP - - three, to - ATT 1/RATE 2.

03 10 36 28 CDR ATT 1/RATE 2. Okay?

03 10 36 34 LMP Let's see, if I remember, the next line is ENTER.
Yes. Yes, we're right there. ...

03 10 36 49 CDR Yes.

03 10 36 53 LMP Okay. FDAI SCALE, 5/5.

03 10 36 55 CDR 5/5.

03 10 36 56 LMP RATE, HIGH.

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CONFIDENTIAL

Day 4

03 10 36 57 CDR RATE, HIGH.

03 10 36 59 LMP Update the DET, if necessary.

03 10 37 04 CDR ... we're right on it.

03 10 37 06 LMP Okay. HELIUM VALVES are AUTO; N₂ A and B are good at 2500. Okay, ... are minus 2 - you get DELTA-V THRUST B to NORMAL.

03 10 37 23 CDR Roger.

03 10 37 31 CDR Let's get this ... here.

03 10 37 41 CMP ... probably ... and follow if you can -

03 10 37 44 LMP Right. Hey, let me do the -

03 10 37 49 CDR Okay; 2 minutes.

03 10 37 51 LMP Okay. DELTA-V THRUST B to NORMAL.

03 10 37 52 CDR DELTA-V THRUST B to NORMAL.

03 10 37 56 LMP THC, armed.

03 10 37 58 CDR THC, armed.

03 10 38 00 LMP RHC, both armed.

03 10 38 02 CDR Both armed.

03 10 38 20 LMP Stand by for minus 35.

03 10 38 24 CDR Okay, that's 35 to go.

03 10 39 09 CDR Okay, it looks like we're coming up to average g.

03 10 39 11 LMP Yes.

03 10 39 13 CDR (Cleared throat).

03 10 39 16 LMP Average g is on.

03 10 39 19 CDR Okay, standing by for a 15-second ...

03 10 39 22 LMP EMS MODE, NORMAL.

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03 10 39 23 CDR NORMAL.
03 10 39 35 MS Ullage.
03 10 39 40 CDR Okay. GO for the burn?
03 10 39 41 CMP You're GO.
03 10 39 46 CDR Ready for the PRO.
03 10 39 50 CMP B valves.
03 10 39 51 CDR B valves.
03 10 39 52 LMP Okay. The clock is running.
03 10 39 56 CMP Oh, she goes.
03 10 39 59 CDR Okay.
03 10 40 05 LMP 10, 9, 8, 7, 6, 5, 4, 3, 2, 1 -
03 10 40 14 CMP Zero; THRUST off; automatic. Gimbal motors.
03 10 40 21 LMP Stand by, Al. 1, 2, 3, 4.
03 10 40 30 CMP You don't trim?
03 10 40 31 CDR Uh-huh.
03 10 40 32 CMP CDR took us to within 1? Good. Now TVC - -
03 10 40 36 LMP TVC SERVO POWER 1 and 2, OFF.
03 10 40 39 CMP OFF.
03 10 40 40 LMP MAIN BUS TIES coming OFF.
03 10 40 41 CMP Roger.
03 10 40 48 CMP ... burns to within 1 foot per second.
03 10 40 51 CDR Okay.
03 10 40 52 LMP Pressure's down.
03 10 40 53 CMP Pressure's still coming ... down.

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03 10 40 57 LMP ...

03 10 41 02 CMP Okay, Jim.

03 10 41 03 LMP Okay, you got everything?

03 10 41 05 CMP Let's clean them up.

03 10 41 06 LMP Okay, EMS FUNCTION's off.

03 10 41 07 CMP Off.

03 10 41 08 LMP EMS MODE, STANDBY.

03 10 41 09 CMP STANDBY.

03 10 41 10 LMP RHC and THC locked.

03 10 41 11 CMP Locked.

03 10 41 12 LMP DEAD BAND, MAX.

03 10 41 13 CMP MAX.

03 10 41 14 LMP TRANSLATION CONTROL POWER, OFF.

03 10 41 15 CMP OFF.

03 10 41 16 LMP ROT CONTROL POWER, DIRECT, OFF.

03 10 41 18 CMP Two - that's two OFF.

03 10 41 20 LMP BMAG MODE, three, to RATE 2.

03 10 41 21 CMP RATE 2.

03 10 41 22 LMP CB, DIRECT ULLAGE, two, open.

03 10 41 24 CMP DIRECT ULLAGE, open.

03 10 41 26 LMP CB, SPS PITCH 1 and YAW 1, open.

03 10 41 29 CMP PITCH 1, YAW 1, open.

03 10 41 30 LMP PCM BIT RATE going LOW.

03 10 41 32 CMP A and B also open.

CONFIDENTIAL

[REDACTED]

03 10 41 34 CDR ... by 10 miles.

03 10 41 44 LMP Let's see ... That's got to be Tsiolkovsky.

03 10 41 47 CMP ... overburned just a little bit, but the little ... was 10 seconds short.

03 10 41 52 CDR ... second burst, and we overburned just a bit.

03 10 42 09 LMP Okay, I'm going to go down and ... up the SIM bay here.

03 10 42 23 CDR Look at this ...

03 10 42 26 CMP See where it says 2 5 ... 25 ...

03 10 42 37 CMP Okay, let's see what it says here.

03 10 42 38 CDR Okay.

03 10 42 58 CDR You know what the ..., don't you? ...

03 10 43 01 CMP What?

03 10 43 02 CDR ... seconds to go. Probably ... and ... 10 seconds.

03 10 43 08 CMP That's right. We did ... over.

03 10 43 10 CDR Yes. We did - especially when ... getting ...

03 10 43 16 CMP ... I could - I could tell ... - not ... on.

03 10 43 21 CDR Yes.

03 10 43 22 CMP I thought about that, you know?

03 10 43 23 CDR Yes. Yes.

03 10 43 24 CMP It was just right after ...

03 10 43 25 CDR I could - I could see your hand start to go. And I looked at the DSKY and looked up, and then I could see it was going to shut off. But I could see your hand - you were - you were waiting for it. I knew I wasn't going to be more than half a second after.

03 10 43 35 CMP Yes. That - that's pretty close.

[REDACTED]

CONFIDENTIAL

03 10 43 36 CDR Yes.

03 10 43 37 CMP But you could see it - I could see when (cleared throat) when it automatically shut down before I could ...

03 10 43 44 CDR Oh, yes.

03 10 43 46 CMP Well, you know the ball valve actually opened up ... like that ... And I usually - -

03 10 43 52 CDR Yes.

03 10 43 53 CMP - - can't see that. I started to watch the ...
P_C started ...

03 10 44 00 CDR ... shut down ...

03 10 44 03 CMP ... I know what you mean - -

03 10 44 04 CDR ...

03 10 44 05 CMP Yes, I know. I keep telling them it's going to be ...

03 10 44 12 CDR Oh yes. Right ... nothing like a ..., wouldn't you say?

03 10 44 23 CMP Yes. Okay. ... VERB ... get it in ...

03 10 44 26 CDR All right. What do you want to do?

03 10 44 29 CMP ... a?

03 10 44 38 CDR Yes. Yes. ...

03 10 44 54 CMP ...

03 10 44 56 CDR Yes. Oh, here comes ... That terminator is just like something out of the movies.

03 10 45 11 CMP Yes. ... - -

03 10 45 12 CDR I mean it's just a - just a strip all the way across.

03 10 45 15 LMP Yes, boy.

03 10 45 18 CDR Hold your breath on this one, Jim?

CONFIDENTIAL

[REDACTED]

03 10 45 21 LMP What in the hell would you ...?

03 10 45 25 CDR Yes. Yes, but I wouldn't say it ...

03 10 45 34 LMP Oh,

03 10 45 38 CDR Huh?

03 10 45 39 LMP Do you know what we have to do yet?

03 10 45 41 CDR Yes. ...

03 10 45 45 LMP Gee. This is ... We're not even down in the ...

03 10 45 49 CDR (Laughter)

03 10 45 51 LMP Wait until we get down in the ..., then we're ...

03 10 45 54 CDR 240,000 miles and ... (laughter).

03 10 45 57 CMP What do you want?

03 10 45 58 CDR (Laughter)

03 10 45 59 LMP ... you know, but ... - -

03 10 46 00 CMP You want me to put you on the surface?

03 10 46 02 CDR (Laughter)

03 10 46 03 LMP ... - -

03 10 46 04 CDR Why don't you, Al? (Laughter)

03 10 46 05 LMP - - ...

03 10 46 06 CDR That's true (laughter).

03 10 46 08 LMP ...?

03 10 46 09 CDR Yes, that's right (laughter).

03 10 46 11 LMP ... - -

03 10 46 12 CDR No. I want to be safe (laughter).

03 10 46 13 LMP ...

[REDACTED]

CONFIDENTIAL

03 10 46 16 CDR Yes, you're right, boy, you're right. ... - -

03 10 46 24 SC (Yawn)

03 10 46 26 CDR ...?

03 10 46 28 LMP That's right.

03 10 46 29 CDR Go on to sleep, Al.

03 10 46 30 LMP ...

03 10 46 31 CDR ... I think you're about ready for bed.

03 10 46 55 CMP ... P52.

03 10 46 57 CDR No.

03 10 46 58 LMP Yes. ...

03 10 47 00 CMP ...

03 10 47 01 LMP Let's see if we can't help Al a little bit.

03 10 47 03 CDR Sure. Let's ...

03 10 47 06 CMP No. ...

03 10 47 10 CDR If you're going to be operating this ... for 3 days, we ought to try and set up a system to square it away.

03 10 47 13 CMP ...

03 10 47 15 LMP Yes. ...

03 10 47 16 CMP ...

03 10 47 17 LMP ...

03 10 47 22 CMP ..., ..., and tomorrow night ..., except most of those pictures would be in the open. ... pictures of the lunar surface. I think it'll probably ... a couple of days ...

03 10 47 37 CDR I think so, too.

03 10 47 38 CMP ... situation..., fill it up, and ...

CONFIDENTIAL

03 10 47 48 CDR Yes.

03 10 47 49 CMP You really need to do that. You can't just ...

03 10 47 58 LMP If you're at all worried about the Flight Plan, ...

03 10 48 05 CMP Hey, that looks black. Wouldn't you say that's black?

03 10 48 09 CDR I'd say it's a dark gray.

03 10 48 11 LMP There's something up here that's dark gray?

03 10 48 13 CDR Well, this looks like it's ...

03 10 48 20 LMP Man, it already looks like we're lower. Whoop.

03 10 48 25 CMP ... looks black over there.

03 10 48 29 CDR Hey, that's right. It looks real dark way down there.

03 10 48 33 CMP ...

03 10 48 35 LMP They say then it looks like you're just going to dive.

03 10 48 38 CDR It sure does.

03 10 48 39 LMP ... going at 50 feet per second.

03 10 48 41 CDR Yes, siree-bob. Hey, look at that big mound over here, son of a gun. Hey, hey, check the mound ... over here.

03 10 48 51 LMP Oh, yes?

03 10 48 53 CMP That's Van De Graaff.

03 10 48 54 LMP That's bigger than Van De Graaff.

03 10 48 55 CDR The one right under us?

03 10 48 56 CMP No, the one just out there at 11 o'clock.

03 10 48 58 CDR Oh, yes.

~~CONFIDENTIAL~~

03 10 48 59 CMP The long - elongate one. That's Van De Graaff. And just out in the distance there, off to the left is - is the Mare Ingen-u-ity.

03 10 49 12 CDR Oh, yes. ... to the left?

03 10 49 14 SC (Yawn)

03 10 49 15 CMP That's ... It's just as ...

03 10 49 16 LMP ... mountain's ..., and the ... mountain's ...

03 10 49 19 CDR Whoo-ho-ho! Oh, ho, no. (Laughter).

03 10 49 23 LMP He's already ... Hey, what do we - what do we have to do?

03 10 49 28 CDR Hold on a minute.

03 10 49 29 LMP ...?

03 10 49 30 CDR Roger. We already look low, and we got 180 degrees to go, babe.

03 10 49 39 LMP What time do we ...?

03 10 49 41 CMP Another 25 minutes.

03 10 49 43 LMP Holy cow.

03 10 49 47 CDR Hey, you can ... It's a great place to take a bunch of pictures of the - of the ... and all that. We ought to do that ...

03 10 50 01 CMP Look at that ... down there, underneath us. About there.

03 10 50 08 LMP ...

03 10 50 17 CDR Well, old buddy, I guess that's all very ...

03 10 50 21 LMP Yes.

03 10 50 22 CMP Is this ... rille that - or is this a rille?

03 10 50 28 CDR What?

03 10 50 29 CMP This ... flat piece we're coming up on.

~~CONFIDENTIAL~~

03 10 50 30 LMP No.

03 10 50 31 CDR Hey, no, that's that rille I was talking about before.

03 10 50 32 LMP Yes, Al.

03 10 50 33 CDR Yes. This one ... here. ... first time ...?
Where is that crater?

03 10 50 39 CMP We ought to get a picture of that ...

03 10 50 42 CDR ... reading?

03 10 50 45 CMP ... 08. It's close to Kepler.

03 10 50 49 LMP It almost looks like it's a ... feature rather
than a rille.

03 10 50 52 CDR The one we're going over right now?

03 10 50 54 LMP Yes.

03 10 50 55 CDR Yes. Who's got the 80? Is it CMP?

03 10 50 58 LMP I'm looking.

03 10 51 05 CMP See out here at 10 o'clock, Dave?

03 10 51 07 CDR Yes. I do.

03 10 51 08 CMP That's the one we picked up on the map, we
called ...

03 10 51 11 CDR The rille?

03 10 51 12 CMP Yes, because it just kind of - slopes on the in-
side; looks like most of the ... turns up even
though there isn't any rille.

03 10 51 21 CDR ...

03 10 51 23 LMP Okay, Al. Here's the - the 80.

03 10 51 35 CDR I don't ... - -

03 10 51 36 LMP You'll get a much better picture from this attitude.

03 10 51 38 CDR Is that right?
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

Day 4

03 10 51 44 LMP Just like a low-level flight.

03 10 51 54 LMP ... this is really ...

03 10 51 56 CMP We must be ... here.

03 10 51 59 CDR Oh, what's the ...? How much time we got before ...?

03 10 52 02 CMP ... showing 63 and 1 ...

03 10 52 09 CDR ... use the 250 or do you want to go to - -

03 10 52 11 CMP Let me get - let me get one here with the 250. ...

03 10 52 23 LMP ..., Dave?

03 10 52 25 CDR ...

03 10 52 57 LMP Yes, sir! ...

03 10 52 39 CMP That was a ... continuous ...

03 10 52 55 LMP ... low.

03 10 53 00 CMP ...

03 10 53 05 CDR You know, we are going ...

03 10 53 23 CDR Look at that.

03 10 53 24 LMP ...

03 10 53 26 CDR It's really ...

03 10 53 28 CMP ... - -

03 10 53 31 CDR Yes - -

03 10 53 32 LMP - - ...

03 10 53 33 CMP - - ...

03 10 53 36 CDR Yes.

03 10 53 40 CMP Wouldn't that be something? ... right over there ...

03 10 53 57 CMP ...

~~CONFIDENTIAL~~

03 10 54 05 CDR Did you ever check those photo things for me, Jim?

03 10 54 07 LMP Yes. ...?

03 10 54 09 CDR Quite sure. Yes. There should be two that were like that.

03 10 54 15 LMP Just a minute here.

03 10 54 22 LMP Well, you're looking for ...

03 10 54 27 CDR Sea of Ingenuity?

03 10 54 29 LMP Yes; 5.6 at a 250th.

03 10 54 31 CDR Okay.

03 10 54 32 LMP And then at Keyhole, you look ... And The Bright One, you look to the left.

03 10 54 59 CDR You know, I think this is ... down here. Look at ... - -

03 10 55 00 CMP ...

03 10 55 02 CDR - - ... We'll get a couple of pictures here.

03 10 55 10 CDR ... though.

03 10 55 30 CDR You got a roll in there?

03 10 55 31 CMP Yes. P ...

03 10 55 33 CDR ...

03 10 56 07 CDR You might say some of those craters are really ...

03 10 56 11 CMP ... navigation is a little more difficult down at this altitude.

03 10 56 14 CDR Huh?

03 10 56 15 CMP Navigation is more difficult at this altitude.

03 10 56 17 CDR ...

03 10 56 20 CMP Low-level navigation.

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03 10 56 21 CDR Oh, I don't know.

03 10 56 24 CMP Did you get yourself located?

03 10 56 27 CDR ... pretty well - set.

03 10 56 36 CDR ...

03 10 56 39 LMP At least you can follow them, now that we're going forward.

03 10 56 44 CMP You should be coming upon Gagarin ...

03 10 56 53 CDR There's sure a good-sized one off to the north.

03 10 56 58 LMP Well, Gagarin is very shallow, oval.

03 10 57 03 CDR See that? Off to the north?

03 10 58 15 CDR Have you see it yet? Jim apparently has the right idea.

03 10 58 24 LMP Yes.

03 10 58 25 CMP ...

03 10 58 42 CDR Well, it's in the right attitude. Can you see anything over there, Jim?

03 10 58 45 LMP Yes. ... all right.

03 10 58 50 CMP It looks that way, but it sure is ...

03 10 58 52 CDR Watch the TV.

03 10 59 13 CDR Look for the ... one over on the left side.

03 10 59 15 CMP Yes.

03 10 59 16 CDR Should come over the horizon.

03 10 59 18 LMP ...

03 10 59 20 CDR ...

03 10 59 22 LMP No, I ...

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03 10 59 26 CMP Yes. That is the central peak of Tsiolkovsky, I bet you 10 dollars.

03 10 59 34 CDR Really?

03 10 59 35 CMP Yes.

03 10 59 36 CDR And that is - -

03 10 59 37 CMP ... - -

03 10 59 38 CDR - - sort of a big ...

03 10 59 39 CMP ... in the rim.

03 10 59 40 LMP ...?

03 10 59 41 CDR Huh?

03 10 59 42 CMP No.

03 10 59 51 CDR Think there's ... in the ...?

03 10 59 54 CMP Well, there's - Yes, there's parts of it that are very small, such as the peak.

03 10 59 58 LMP But I guess it doesn't really strike home until you get down to something like this ...

03 11 00 05 CDR Good idea. I'll ...

03 11 00 13 CMP ...

03 11 00 16 CDR Oh, boy. I'll never sleep ... open.

03 11 00 21 LMP No, that's a pretty good theory, though.

03 11 00 22 CMP Yes, I want to - I want to wade through ... - go through this.

03 11 00 26 CDR ...

03 11 00 28 CMP Yes. Yes, ...

03 11 00 41 CMP Okay. We got two developing ... over there.

03 11 00 54 CDR God damn, that's just like being on a poor bus!

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03 11 00 56 CMP (Laughter) ...

03 11 00 57 CDR ...

03 11 00 58 CMP Hard enough?

03 11 00 59 CDR Dark?

03 11 01 00 LMP Yes.

03 11 01 01 CMP ... Up on the ridge line.

03 11 01 04 CDR I think that's shadows, isn't it?

03 11 01 08 LMP I don't think that's shadow ...

03 11 01 12 CDR ... good idea. ...

03 11 01 15 CMP Yes.

03 11 01 37 CDR Oops, over here ...

03 11 01 40 CMP What the hell is it?

03 11 01 41 CDR Two old compasses.

03 11 01 51 CMP Oh, good grief ...

03 11 01 57 LMP Oh, man. That sure is a great landmark.

03 11 02 08 CMP Isn't it?

03 11 02 09 CDR ... supposed to do that, you know where we are.

03 11 02 10 CMP Yes. Boy, you sure got a good attitude, Dave. It ...

03 11 02 17 CDR Isn't it beautiful!

03 11 02 18 CMP No, I couldn't - I couldn't have picked a better one myself.

03 11 02 30 CDR I'm trying here to figure out where those two ... are.

03 11 02 33 CMP They should be -

03 11 02 48 CMP ... - Look at that - that one right there. Right there.

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[REDACTED]

03 11 02 52 CDR ...

03 11 02 53 LMP/CMP Whoa.

03 11 02 54 CMP Now look out.

03 11 02 55 CDR Oh, yes. Hey, yes. That's Mount ...

03 11 02 56 CMP Yes, yes.

03 11 02 58 CDR ... Say, you can really see, can't you?

03 11 03 49 CMP Light's on.

03 11 04 14 CMP Why don't you take you some pictures?

03 11 04 15 LMP Okay.

03 11 04 20 CMP Let's see, we're right at ... No, let's see. ...

03 11 04 27 CDR We're heading just a little bit to the ri - to the left of our Flight Plan.

03 11 04 31 CMP What?

03 11 04 32 CDR And maybe a few deg - around the curve, there.

03 11 04 34 CMP Curve?

03 11 04 35 CDR Yes, don't you - -

03 11 04 36 CMP You want to show me it?

03 11 04 37 CDR Yes. My pleasure. Look. There it is. Look.

03 11 04 43 CMP Maybe you should ... on the end there.

03 11 04 45 CDR Oh, nothing.

03 11 04 46 CMP ... Everyone says ... that you're not allowed to do it, but you have to do it if ...

03 11 05 10 CMP Does it look like anything?

03 11 05 11 CDR Yes.

03 11 05 48 CMP ...

[REDACTED]

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03 11 05 55 CDR Move the fans over.

03 11 05 58 CMP Will the ...?

03 11 05 59 CDR Yes.

03 11 06 01 CMP Okay.

03 11 06 04 LMP Hey, you guys really ...

03 11 06 07 CMP Yes.

03 11 06 08 LMP That's when you ... You can feel it.

03 11 06 10 CDR Yes.

03 11 06 12 CMP ... (coughing) ...

03 11 06 15 CDR What?

03 11 06 16 CMP ... that long.

03 11 06 18 LMP You going to be able to look at it through your sextant? Did you -

03 11 06 22 CMP I'm not sure.

03 11 06 24 CDR ...

03 11 06 30 LMP ...

03 11 06 35 CMP Yes, do you mean we got to go up through the ...?

03 11 06 37 CDR If you're not going to make it?

03 11 06 38 CMP No, I - I figured you'd rather do it.

03 11 06 40 CDR No, it's up to you. You do whatever you'd like.

03 11 06 41 CMP No. Oh, no, I'm not going ... - -

03 11 06 44 CDR Okay, very good.

03 11 06 45 CMP - - ...

03 11 06 46 CDR That's right.

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03 11 06 47 CMP ... you got to give a ... that you'll get over it.
You - you do everything you want to do.

03 11 06 49 LMP ...

03 11 06 50 CDR (Laughter)

03 11 06 51 CMP I - If I'm in your way, just ... it down.

03 11 06 53 CDR Oh, sure.

03 11 06 54 LMP/CMP (Laughter)

03 11 06 55 CMP ... - -

03 11 06 56 LMP You're too hard for him. You be easy on him, or
he'll ... - -

03 11 06 59 CMP Oh, yes. Very good.

03 11 07 08 CDR Where is ..., by the way?

03 11 07 10 CMP It's out in the middle of ...

03 11 07 12 CDR Is it really?

03 11 07 13 CMP Yes.

03 11 07 14 CDR The same crater as we were ...?

03 11 07 15 CMP Yes.

03 11 07 16 CDR The same patterns as ... Crater?

03 11 07 18 CMP As a matter of fact, I could have gone through ...

03 11 07 20 CDR Why don't you do that?

03 11 07 21 CMP Okay.

03 11 07 22 CDR That'd give us an idea of what you're going
to be looking at. ... - you know you ...

03 11 07 31 CMP Well, I tell you, it's not a very - it's not a
very colorful crater.

03 11 07 41 CDR ..., Jim. Did you see ... over there?

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03 11 07 45 LMP Yes.

03 11 07 47 CMP It's sure going to be ... stick to the time line.
Yes, that would.

03 11 07 54 LMP One-half hour.

03 11 07 56 CDR ...

03 11 07 58 CMP Hey, you ...

03 11 08 05 LMP You got a ... space.

03 11 08 09 CMP Yes, can't even see the horizon.

03 11 08 13 CDR Yes.

03 11 08 14 CMP ... in the ORB rate. ... get back to the ...

03 11 08 32 CDR ... VERB 67.

03 11 09 50 CDR ... we can get to this ... The - Can you move
that thing?

03 11 09 58 CMP Yes.

03 11 09 59 CDR You really don't need ...

03 11 10 00 CMP Yes.

03 11 10 01 CDR Isn't that the truth? You really don't need it.

03 11 10 22 CDR There it is.

03 11 10 28 CMP ...

03 11 10 37 CDR Wait a minute. ...

03 11 10 43 CMP Yes, well, even that ... That's why we had trouble
finding anything at all that we could use, because
there isn't anything.

03 11 10 49 CDR Nothing to change it over here at all. Nothing
to change it, Al, ... that we could use.

03 11 10 55 CMP How about a - Let's see, what kind of ... we use.
25.958?

CONFIDENTIAL

[REDACTED]

03 11 11 01 CDR Uh-huh. And we've got ...

03 11 11 02 CMP Yes, and you got ... Five point ... here. ...

03 11 11 14 CMP ...

03 11 11 20 CMP ... here. ...

03 11 11 23 CDR Huh?

03 11 11 24 CMP3 ...

03 11 11 33 CDR ...

03 11 11 35 CMP ...

03 11 11 37 CDR ...

03 11 11 39 CMP Yes.

03 11 11 41 CDR There'd be a lot more.

03 11 11 44 CMP Yes.

03 11 12 03 CMP ... And - I'm going to push these back in.

03 11 12 21 CDR ... to be all set up with your G&C Checklist ...
GDC ALIGN.

03 11 12 26 CMP ...

03 11 12 36 CMP ...

03 11 12 42 CDR ...

03 11 13 05 CMP ...

03 11 13 08 CDR Yes.

03 11 13 14 CMP Got that.

03 11 13 23 CDR I get that initial downhill impression. We're
supposed to be ...

03 11 13 27 CMP ... did.

03 11 13 37 CMP ...

[REDACTED]

CONFIDENTIAL

03 11 14 56 CMP Darn it. Right there.

03 11 14 58 CDR There it was, whatever it was.

03 11 15 00 CMP Hum. ...

03 11 15 04 CDR Yes.

03 11 15 05 CMP Good. ...

03 11 15 24 CDR Did you get this ... on, Jim?

03 11 15 27 LMP Yes, but I never could tell ..., when it went on.

03 11 15 31 CDR Okay.

TIME SKIP

03 12 15 25 CMP Okay. LASER ALTIMETER, ON.

03 12 15 27 CDR Yes.

03 12 15 28 CDR MARK.

03 12 15 29 CMP Okay, let me talk to Karl here for a minute.
Houston, 15.

03 12 15 40 CMP Okay, Karl. I got a few numbers for you on the extension time. 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. And we deployed the gamma ray and the mass spec booms for a barber pole plus 2 seconds. The gamma ray - turned barber pole after 6 seconds, and the mass spec turned 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 the laser altimeter on at 84:15:30.

03 12 16 30 CMP Looks like that stuff's working fine. Tch, tch.

03 12 16 32 CDR Great! Super!

03 12 16 34 LMP Good enough.

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03 12 16 36 CMP That's it. Verify DSE tape motion at 84:20, and then we get the cameras ready for terminator photos.

03 12 16 44 CDR That a boy!

03 12 16 50 CMP Pan camera, we go - we already got our terminator photos. Did you get - Let's see, we want MAG R. That's this MAG here.

03 12 17 07 CDR With the Hasselblad? You got the Hasselblad over there?

03 12 17 12 CMP Yes. And, let's see, we want the Hasselblad 80 millimeter, intervalometer - -

03 12 17 21 CDR Let's see, intervalometer's down there, Jim, in the - Let's see - It's in the camera - It's right in front of the camera compartment.

03 12 17 36 CMP Oh, boy.

03 12 17 38 CDR It's right there; that's it.

03 12 17 43 CMP Okay. What do you want to do now, get the Hasselblad?

03 12 18 01 LMP Jim, you're all right.

03 12 18 08 CMP Well, the way to do that is just to play it straight from now on.

03 12 18 17 CMP ... I need somebody to take care of me.

03 12 18 30 CMP ...

03 12 18 31 LMP Yes.

03 12 18 33 CMP ... an earful of that. 15, Roger. That's verified. Is that right, Dave?

03 12 18 42 CDR Yes.

03 12 18 46 LMP If ... orders, I can get it.

03 12 18 49 CDR Okay.

03 12 19 01 CMP Man, that's really good and stuck!

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03 12 19 04 LMP ... all right.

03 12 19 06 CMP Pork and scalloped potatoes!

03 12 19 15 CDR You'll have what?

03 12 19 18 CMP I'm going to order pork and scalloped potatoes; I don't whether you do or not, but I am.

03 12 19 23 CDR Okay, f - 2.8, 1/250th, and infinity. Take six frames. Okay. Right out of this window here. And we're going to get the pan camera going in there, too.

03 12 19 54 CMP ...

03 12 20 00 CDR That's frame number - 14.

03 12 20 35 CMP ...

03 12 20 36 LMP That's right (laughter).

03 12 20 38 CDR We both like to hear that (laughter).

03 12 20 46 CMP Now, I'm going to show you how I'm going to handle this stuff here. Well, it looks like we just lost them. (Cleared throat).

03 12 21 14 CMP That won't be the same from now on.

03 12 21 17 CDR It won't?

03 12 21 18 CMP No. Minus 5 and 25.

03 12 21 25 CDR ...?

03 12 21 27 CMP Yes. Because we're in SIM bay attitude now.

03 12 21 31 CDR ... A and B.

03 12 21 32 CMP That's the stowed position only. It - it's minus 5 and 25 for REACQ when we come around the other side.

03 12 21 39 LMP Okay. ...?

03 12 21 41 CMP Yes.

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03 12 21 45 LMP I'll tell you, this Moon flying could be fun.

03 12 21 48 CMP This what?

03 12 21 49 LMP I said, "This Moon flying could be fun."

03 12 21 50 CMP Yes, yes, yes, yes.

03 12 21 53 CDR Hey, listen, Al, we got to get the pan camera going here, right?

03 12 21 57 CMP Okay, T-start is the (cleared throat) - -

03 12 22 01 CDR ...

03 12 22 03 CMP Yes. T - T-start is the big time, and everything's hinged around T-start, so I take that time and punch it into P30 (cleared throat). And just load NOUN 33 to that time.

03 12 22 19 CDR ...

03 12 22 23 CMP We're gaining 4 - plus 42 23, I guess.

03 12 22 40 CMP Yes, I'm going to do it like that on all of them. Now, when you come up on a thing like that, EL says T-start minus 1:40 -

03 12 22 57 CDR Yes.

03 12 22 58 CMP Well, it's right on the DSKY there.

03 12 23 00 CDR ...

03 12 23 02 CMP And the MAPPING CAMERA, IMAGE MOTION, ON. Talkback barber pole 3 to 5 seconds, then gray. That can be done anytime; that's not important. EL OFF at T-start; MAPPING CAMERA, ON, at T-start; PAN CAMERA, OPERATE, at T-start. Jesus, they got all kinds of things going on here at T-start. MOTION INCREASE - talkback barber pole plus 2 steps. I better do that mapping-camera thing.

03 12 23 26 LMP ...

03 12 23 34 CMP You got 18 minutes ... - If you'll take the EL, and all you got to do is - point the - point the

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Day 4

Hasselblad straight down and start the intervalometer going, and start it at - at - at minus 1:40 on the clock and stop it as zero.

03 12 23 48 LMP All right.

03 12 23 52 CMP And it would be much appreciated.

03 12 23 56 LMP ...

03 12 23 57 CMP Okay.

03 12 24 04 CDR Jim, is my spoon up there somewhere? Spoon. Yes, it should be back in there.

03 12 24 18 LMP ...

03 12 24 22 CDR Find it anywhere?

03 12 24 38 CMP (Laughter) No, I'm not. I just didn't want to get in your way, believe it or not.

03 12 24 57 CMP Ah, let's see; yes, we're ready to go over here; 84:24; at about 84:33, we better do all that business. In the meantime, grab a bite. What are we having?

03 12 25 14 CDR Pork and scalloped potatoes.

03 12 25 15 LMP It's not bad.

03 12 25 16 CDR You know, I don't know why it is, every night at this time, my nose gets stuffy.

03 12 25 18 LMP Mine does, too.

03 12 25 20 CDR Every night, my - my nose starts getting stuffy along about this time, and then it cleans up after a bit.

03 12 25 25 LMP ...

03 12 25 27 CDR Yes, give me another squirt of hot juice there - when you get a chance.

03 12 25 38 CDR Hey, Jim, you know what I do tomorrow?

03 12 25 41 LMP Can't guess.

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[REDACTED]

03 12 25 42 CDR Let's go shoot a landing. I'm ready. I'm ready to put that baby right in there, right now. I haven't had a TV flight in months.

03 12 25 59 CMP Yes, sir, you better. You'll lose you ...

03 12 26 02 LMP That's right.

03 12 26 56 CMP Oooh, that one's stretched. Pork and scalloped potatoes!

03 12 27 02 CDR Sounds good.

03 12 27 03 CMP Just like down home.

03 12 27 06 CDR Mm-hmm.

03 12 27 25 LMP ...

03 12 27 30 CDR (Laughter) Yes, you - you know, it really works - works just fine if you - if you pop it and just keep pulling.

03 12 27 43 CDR Hey, Jim?

03 12 27 47 LMP ... water here ...

03 12 28 30 LMP ... I think, the first thing I'm going to do when we get back?

03 12 28 34 CDR What's that?

03 12 28 35 LMP Have a beautiful night in Tahiti.

03 12 28 37 CMP Hey, you're on, buddy. You're on - you're on! ...

03 12 28 41 LMP No, really. You ought to really think about it.

03 12 28 44 CDR Me, too. Big airliner.

03 12 28 47 LMP Without the aviation.

03 12 28 49 CDR Hey, you know what they tell you when you get to the ...?

03 12 28 50 CMP No.

03 12 28 51 CDR ...

[REDACTED]

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03 12 28 53 LMP Is that right?

03 12 28 54 CDR ... They got up a special menu; it has everything that you want on it. You can eat steak and eggs ...

03 12 29 05 LMP Is that right?

03 12 29 06 CDR ... steak and eggs, or scrambled. ...

03 12 29 12 CMP You don't ... scrambled eggs, do you, Jim?

03 12 29 15 LMP Yes.

03 12 29 16 CMP ...

03 12 29 18 CDR Huh.

03 12 29 19 CMP ...

03 12 29 22 LMP All right.

03 12 29 23 CMP ...

03 12 29 24 LMP (Laughter)

03 12 29 27 CMP ..., Dave.

03 12 29 28 LMP (Laughter)

03 12 29 30 CDR You've been away too long, Jim!

03 12 29 32 LMP (Laughter)

03 12 29 35 CDR Golly.

03 12 29 38 CMP Yes. ...

03 12 29 58 CDR Is that all we get to eat?

03 12 30 01 LMP Yes, I think so. ...

03 12 30 08 CMP We ought to be about through with that food locker.

03 12 30 38 CDR ... pictures. Do we just take them from straight down?

03 12 30 42 CMP ...

03 12 30 54 CMP ... you want to ... You - you got that ...?

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03 12 31 21 CMP Okay, there's REV 3 ...

03 12 31 25 CDR Take it out of window 4.

03 12 31 30 CMP These will be the LM. You got all of them?

03 12 31 32 CDR Yes.

03 12 31 33 CMP And right at - the start of the ... You want to start looking out the window, window 4. ...

03 12 31 44 CDR ...

03 12 31 49 CMP And then you want to ... off ...

03 12 31 54 CDR That's right. Switch them back in stereo now?

03 12 32 00 CMP Yes. ...

03 12 34 11 CMP ... now. ...

03 12 34 38 CMP You know, that feels funny to look down.

03 12 34 41 CDR Yes, ...

03 12 36 03 LMP ...

03 12 36 05 CDR What's wrong, Jim. ... doing the dishes?

03 12 36 08 LMP ...

03 12 36 34 CDR ...

03 12 36 36 CMP ...

03 12 36 44 CDR ...

03 12 36 56 CDR I got mine right over to here.

03 12 37 09 CDR Yes, I have them.

03 12 38 44 CDR Okay. ...

03 12 38 59 CMP Ah, man. ...

03 12 39 15 CDR Looks to me like we're roll.

03 12 39 18 CMP We're roll.

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03 12 39 19 LMP Yes.

03 12 39 22 CDR Is - is this picture supposed to be an oblique?

03 12 39 28 CMP It's not a - a vertical picture.

03 12 39 30 CDR It's an oblique picture, really.

03 12 39 36 CMP Minus 1:40?

03 12 39 41 CDR Okay. ...

03 12 39 47 CMP Straight down?

03 12 40 50 CMP No, you're ...

03 12 41 03 CMP Pretty dark.

03 12 41 25 CDR Yes. Okay. I see where we are. Okay. ...

03 12 41 30 CMP Yes.

03 12 41 34 CDR Yes, but I - I seem to have it located myself here.

03 12 41 37 CMP Oh.

03 12 41 38 CDR I don't ..., but it's dark in here.

03 12 41 51 CMP Nassau Bay was in the dark, I'm sorry to say.

03 12 41 55 CDR Yes.

03 12 42 05 CMP ...

03 12 42 43 CDR I want to take one more for good measure - -

03 12 42 46 CMP All right.

03 12 42 47 CDR - - but now it's getting in an area where you're getting something.

03 12 43 02 CDR Okay.

03 12 44 11 CMP Okay, let me turn this over here on the - Let me put this back under here - the bracket; it's a good place for it to be.

03 12 44 38 CDR Okay. ...

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03 12 44 40 LMP Your next ... - is -

03 12 44 56 CDR ... 228.

03 12 44 58 CMP But that's a - that's a good place for it.

03 12 45 03 CDR Yes. Good idea. Run them back in here.

03 12 45 11 CDR Really?

03 12 45 14 LMP Yes.

03 12 45 20 CMP Oh, I'm starving.

03 12 45 29 CDR Okay.

03 12 45 30 CMP Give me a lunch pack, and I'll eat it.

03 12 46 08 CDR What is it?

03 12 46 10 CMP Meatballs and sauce.

03 12 46 37 CDR ... Need any help?

03 12 46 46 CMP Do what?

03 12 46 53 CDR Oh, isn't that sweet?

03 12 47 28 CDR You want me to move? You want to get over here?

03 12 47 47 LMP ...

03 12 47 49 CMP Meatballs and sauce.

03 12 47 51 LMP Give me a spoon ... You got something for those?

03 12 47 59 CDR No wonder you never lose it.

03 12 48 01 LMP ...

03 12 48 24 CDR One thing you're going to learn how to do is fly upside down.

03 12 48 26 LMP (Laughter)

03 12 48 45 CDR Yes. Yes. You'll be able to fly right-side up.

03 12 49 12 LMP ...

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03 12 49 21 CMP Now I can see a bunch of ...

03 12 49 25 LMP What ...?

03 12 49 27 CMP ... Put it on the ...

03 12 49 49 CDR Okay. Let me go to the movie.

03 12 49 58 CMP No, by golly, there are lineaments down there all over the place, going - Well, northeast - Yes, northeast, southwest. See it? Right up on the ridge. Right along all the ..., by golly. Look at that.

03 12 50 16 CDR Look out the window, Al.

03 12 50 18 CMP What's over there?

03 12 50 19 CDR What? Right here. Look out the center window, right down this way. We'll be parking right over - right over the grid.

03 12 50 30 CMP You mean right over the - the ridge here? Right along the lunar ...

03 12 51 13 CDR As long as you ... having a - the ground track that changes every rev, you're never going to get tired of looking at new things. You know, you'll have something new to look at the whole way.

03 12 51 41 CDR That looks dangerous.

03 12 51 42 LMP (Laughter)

03 12 51 43 CDR You know, I about had meatballs all over the place.

03 12 52 02 CDR What are you waiting for 2 minutes from now?

03 12 54 12 LMP ...

03 12 54 59 CMP Yes. I'll ... a couple ...

03 12 55 04 LMP ...

03 12 55 10 CMP I didn't mean to.

03 12 55 24 CMP One minute to go.

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03 12 55 42 CDR You want me to get the mass spec and do what?

03 12 55 43 LMP No, the boom out.

03 12 55 44 CDR Oh.

03 12 56 25 CDR Well, I was just thinking about that. I think what we need to do - is - You might take a little bath ... By golly, let's go do some around the Moon ...

03 12 56 42 LMP One.

03 12 56 48 CDR Huh?

03 12 56 49 CMP ... putting them on.

03 12 56 57 CDR I figure we're far enough ahead - now. You can stop it - if you want to, you know, to live it up. Really live it up. Get clean, fresh -

03 12 57 42 LMP ...

03 12 57 45 CMP Oh, you might ..., I guess.

03 12 57 48 LMP Okay.

03 12 58 50 CDR ...

03 12 58 58 CDR Oh, look at - look at the one coming up, Al. Look at the debris in the bottom of that crater and over at the side there. Look at that!

03 12 59 10 CMP ... a tree stump ...

03 12 59 13 LMP Yes.

03 12 59 14 CDR It's got a big ... on the side.

03 12 59 17 CMP ...

03 12 59 19 CDR ... Check The Bright One? Boy, look at the junk coming out of it.

03 12 59 54 CDR See this one wall here - how it's completely collapsed, straight down, and a bunch - bunch of little benches go down even farther - towards the bottom.

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03 13 00 23 CMP The way that one ...

03 13 00 25 CDR Which direction?

TIME SKIP

03 22 05 20 LMP Your candy, Dave, is in that bag over there. Your breakfast is right here.

03 22 05 25 CDR Thank you. You're a good guy.

03 22 05 27 LMP Well, looks - looks like it's about the best way to do it here.

03 22 05 57 CDR No, 33.

03 22 05 59 LMP Is it actually a what, plus or minus - -

03 22 06 00 CDR What?

03 22 06 01 LMP - - 9?

03 22 06 02 CDR Yes.

03 22 06 05 LMP Yes; 33's not so bad, except a -

03 22 06 08 CDR Plus or minus 9; that's a 24.

03 22 06 12 LMP ...

03 22 06 19 CDR I don't know whether we can or not. Let me ...

03 22 06 29 LMP Put a - put a 50-degree mark on the window.

03 22 07 58 CDR Yes. I know it, I want to get ahead. We got - got time to do it now. I just like to get everything done we can, and I'd like to be sitting and waiting.

03 22 09 47 CMP We should have turned that cabin fan off last night. It wouldn't have been so cool - been less noisy.

03 22 09 58 CDR Well, I tell you, I woke up at one time - and I listened to the noise, and I thought the thing was off. I thought to myself, "Great, somebody got up and turned the cabin fan off."

~~CONFIDENTIAL~~

[REDACTED]

03 22 10 11 LMP I was burning up down there. I just about got up and got the hoses - ... them down there.

03 22 10 16 CDR Boy, you should have done that before you went to bed. Get yourself some air.

03 22 10 19 LMP Yes.

03 22 10 26 CDR Did you get any sleep, Jim?

03 22 10 28 LMP Yes, about like the first night.

03 22 10 31 CDR Well, you should have got up and got the hoses then. You need your sleep, babe.

03 22 10 39 LMP Yes.

03 22 10 58 CDR Huh! We're moving it. I can't believe it!

03 22 11 11 CDR The ...! That biomed is working.

03 22 11 15 LMP Al has them.

03 22 11 16 CDR Oh, thanks. Son of a gun.

03 22 14 07 CDR Well, I reckon what we ought to do is the burn, and then get suited. Burn and then get suited, you know - finish up the burn. You can put on your suit; get it out of the way. Go clear out the tunnel.

03 22 15 58 CDR Yes. It really is.

03 22 16 07 LMP I couldn't tell whether the spacecraft was moving or whether Dave was shifting in his couch.

03 22 16 24 CDR Yes, we must have used a fair amount.

03 22 16 27 LMP Need some more? I can get it for you.

03 22 16 31 CDR ... any more ...

03 22 16 38 LMP You ready?

03 22 16 40 CDR Yes. Don't push, just let it go, Jim. Pull it out and let it - and release it. Pull the handle out.

03 22 16 48 LMP Again?

[REDACTED]

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Day 4

03 22 16 49 CMP Just pull out - now let go. That a boy. You don't - you don't push it in. Have you been pushing it in?

03 22 16 55 LMP Sometimes it sticks.

03 22 16 56 CMP No, it never - no, it - it - you - it counts up and - it has a little accumulator in there.

03 22 17 06 LMP Here.

03 22 17 09 CDR Now, just pull it out and - and let it - and leave it go.

03 22 17 12 LMP Okay.

03 22 17 13 CDR The accumulator builds up, and then it'll shoot you. That's where you get your measurement.

03 22 17 29 CDR Take a shot of cold right here.

03 22 17 31 LMP All right.

03 22 17 32 CDR ... than caught short.

03 22 17 37 LMP Ready?

03 22 17 38 CDR Yes.

03 22 17 39 LMP ...

03 22 20 20 CMP ...

03 22 21 23 CDR ... hot chocolate I just grabbed?

03 22 21 25 CMP Yes, sure.

03 22 21 26 LMP ...

03 22 21 35 CDR ... this good stuff is for the kid's stamina.

03 22 22 00 CDR That all right?

03 22 22 06 LMP The opposite end.

03 22 22 10 CDR There. Eat it.

03 22 24 34 LMP Al, I'll leave some bacon squares for you.

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03 22 24 49 CDR ... remembered.

03 22 24 54 CMP ...

03 22 24 55 CDR 100 hours and 13 minutes, I think we ...

03 22 24 58 CMP Hmm.

03 22 25 31 CDR You like bacon squares? I'll leave you some, too.

03 22 25 35 CMP Too much salt. Too dry and salty for a whole meal. I don't ...

03 22 27 11 CMP Ten minutes until AOS. Huh!

03 22 27 15 LMP You going to get this pad on the next rev?

03 22 27 17 CMP Mm-hmm.

03 22 27 18 CDR Al, why don't you and I switch off here when ...

03 22 27 24 LMP I'd like to take a crap if I can work it in, Dave.

03 22 27 28 CDR Okay.

03 22 27 29 LMP Tell me when.

TIME SKIP

03 23 38 42 LMP Al, can you get those?

03 23 38 44 CMP What?

03 23 38 45 LMP LOGIC POWER, two, to DEPLOY/RETRACT.

03 23 38 47 CMP Yes.

03 23 38 48 LMP I can't get in there among all the helmets.

03 23 38 59 CMP DEPLOY/RETRACT.

03 23 39 30 CDR You got another 15 degrees to go, Al.

03 23 39 32 CMP Okay.

03 23 39 33 CDR Jim, could you - -

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Day 4

03 23 39 35 LMP Yes.

03 23 39 36 CDR - - go ahead and finish what you're doing; I'm sorry.

03 23 40 01 LMP Al, you've got to change those LOGIC POWERS, too, and go back on OFF; I'm sorry. I was thinking we had to retract the booms. They're already retracted.

03 23 40 13 CMP Okay. I'll be glad when I get rid of you guys. I won't have to worry about those switches anymore.

03 23 40 18 CDR You won't, huh?

03 23 40 19 CMP Huh-uh.

03 23 40 20 CDR Oh, that's right. You don't have any maneuvers.

03 23 40 22 CMP No, I - I laid it on them. I said, "Those switches, as long as I'm by myself, are going to stay in DEPLOY/RETRACT all the time."

03 23 40 30 CDR That's good. Okay, you're almost there.

03 23 40 32 CMP Okay.

03 23 40 36 CDR And I'll tell you what. Why don't you do your P52, and just stay down there, and I'll do a P30 - -

03 23 40 42 CMP All right - -

03 23 40 43 CDR - - since we're at the attitude - -

03 23 40 44 CMP Yes.

03 23 40 45 CDR - - and let you do the star check.

03 23 40 46 CMP All right. ... warning lines. Jim can pick up the checklist.

03 23 40 54 CDR Okay, you're there.

03 23 40 55 CMP Good.

03 23 40 56 CDR I'll - I'll get the numbers. They recommend 25 and 26.

03 23 40 58 CMP Right. If 25 doesn't come up, I'm going to punch it in.

03 23 41 02 CDR What - -

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03 23 41 03 CMP Twenty-five.

03 23 41 04 CDR Okay. Well, you've got 16 minutes, so you're in good shape.

03 23 41 10 CMP Okay. Twenty-five is Acrux.

03 23 41 25 LMP Do you want to start an EMS DELTA-V test over there - -

03 23 41 26 CDR Yes.

03 23 41 27 LMP - - and null bias check.

03 23 41 28 CDR Okay.

03 23 41 29 LMP Okay.

03 23 41 37 CMP Twenty-six; comes up the right stars.

03 23 41 41 CDR Good.

03 23 41 44 CMP And 26 is Spica.

03 23 42 03 CMP Oh, yes, there's Gienah; this must be Spica.

03 23 42 26 CDR Four balls 1.

03 23 42 27 CMP Beautiful.

03 23 42 29 CDR Torquing angles.

03 23 42 32 CMP One, 2, 3 - Okay, I'll torque them on a minute.

03 23 43 03 CDR Okay.

03 23 43 12 CMP What's the sextant star?

03 23 43 14 CDR Well, wait a minute. Oh, you want to do it right here? Okay, sextant star is number 30.

03 23 43 23 CMP Aaah.

03 23 43 24 CDR Huh.

03 23 43 38 CDR Take a look at your shaft and trunnion, if you can.

03 23 43 41 CMP Yes.

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03 23 43 43 CDR What's that? NOUN 99?

03 23 43 45 CMP Yes. Let's see - 90 - -

03 23 43 48 CDR Okay, it should be 192.8 and 111. You've got 192.1 and 114.

03 23 43 53 CMP That's pretty close.

03 23 43 54 CDR Yes, that's at 192 - 192.8?

03 23 44 05 CDR What are you doing?

03 23 44 07 CMP ...

03 23 44 11 CDR Why don't we just - Let me do a - -

03 23 44 13 CMP Do you want to just take those numbers?

03 23 44 14 CDR No, let me do a P - P30-P41 real quick and get you to - the right attitude.

03 23 44 19 CMP Well, we want to do the sextent star check on their attitude anyway.

03 23 44 24 CDR It doesn't matter.

03 23 44 25 CMP Yes. Well, wait - -

03 23 44 26 CDR 111 - 192.8 - -

03 23 44 27 CMP Okay.

03 23 44 28 CDR - - and 111.

03 23 44 38 CDR There, I - you're in good shape.

03 23 44 45 CMP Yes, it's there.

03 23 44 47 CDR Okay. Good. Okay, why don't you clean up down there? I'll do a 30-41.

03 23 44 55 CMP Okay.

03 23 45 04 CDR I want to go to P00, okay?

03 23 45 05 CMP Okay, you got it.

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03 23 45 21 CDR 3.1, is that all?

03 23 45 23 LMP Yes.

03 23 45 28 CMP They're really getting down to nitpicking. Okay, I'm all cleaned up down here, Dave.

03 23 45 35 CDR Okay.

03 23 45 45 CDR Your TSBs are getting pretty full, aren't they?

03 23 45 48 LMP I think there's a lot of space in the bottoms of them.

03 23 45 51 CMP Well, if you guys leave today, I'll - I'm going to get the JETT bag out and start filling it up with that stuff.

03 23 45 55 LMP Yes.

03 23 45 58 CDR Okay, we're in P41. Trim it out. There, attitude looks pretty good. Okay. Why don't you come up here and do your EMS check?

03 23 46 09 CMP Okay, Dave.

03 23 46 21 CDR 3.1. God, that's a nothing.

03 23 46 26 CMP Yes, they're really splitting hairs.

03 23 46 29 CDR That's all right, I wouldn't feel too comfortable at 24,000 feet on the verge of a 22,000-foot mountain.

03 23 46 39 CMP Yes, well, this'll bring you up 10,000 feet.

03 23 46 42 CDR Yes.

03 23 46 44 CMP Or thereabouts.

03 23 46 48 CDR Are you running a null bias check here?

03 23 46 49 CMP No. I just started to set it up now when you got - -

03 23 46 53 CDR Oh. Okay.

03 23 46 54 CMP - - the numbers in.

03 23 46 55 CDR Did you run the DELTA-V test?

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03 23 46 56 CMP Yes. That's good. It's a minus 21.9.

03 23 46 59 LMP We've got 10 minutes to go.

03 23 47 01 CDR You clock's set, but for some reason it isn't set exactly right. I think that timer drifts on you.

03 23 47 08 LMP Drifts? Yes.

03 23 47 13 CMP Yes. I suspect it very well might.

03 23 47 21 LMP Have we got the DAP set in there that we want?

03 23 47 24 CMP Yes.

03 23 47 25 LMP Four jets?

03 23 47 26 CDR Four jets.

03 23 47 30 CMP ... start.

03 23 47 32 CDR Okay, we got BMAG - -

03 23 47 33 CMP Yes, I've got 21101.

03 23 47 35 CDR Let's go back to - -

03 23 47 36 CMP That gives us four jets.

03 23 47 38 CDR Yes. Let's go check the waste - -

03 23 47 39 CMP I ch - I put that in.

03 23 47 40 CDR You already did that?

03 23 47 41 CMP Yes.

03 23 47 42 CDR Okay.

03 23 47 43 CMP That's the only thing there was to put in.

03 23 47 44 CDR Okay. Roll, pitch, and yaw looks okay.

03 23 47 52 LMP Okay, you want to get ROT CONTROL POWER, NORMAL, two, to AC/DC?

03 23 47 56 CDR AC/DC.

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03 23 47 57 LMP ROT CONTROL POWER, DIRECT, two, to MAIN A, B.

03 23 47 58 CDR MAIN A, MAIN B.

03 23 48 02 LMP I didn't get the chance to check the DET.

03 23 49 09 CDR Looks like it's about 3 or 4 seconds off, and I'm really not sure I understand why.

03 23 48 17 CMP Yes, you can turn it right and the next time you look it's - Oh, ..., forgot to give you that.

03 23 48 26 CDR That's all right. I put your film in your TSB.

03 23 48 29 CMP Okay.

03 23 48 32 LMP Okay BMAG MODE, three, are RATE 2.

03 23 48 34 CDR They're in RATE 2.

03 23 48 36 LMP And we're at CMC in AUTO?

03 23 48 38 CDR Yes, yes.

03 23 48 39 LMP We'll wait until the DELTA-V test is complete to do the trim?

03 23 48 47 CDR DELTA-V test is complete, and it's .8 feet per second per 100 seconds. It's getting better.

03 23 48 54 CMP Yes. ...

03 23 48 56 LMP Okay, do you want to - do you want to trim?

03 23 49 03 CDR Huh? Trim?

03 23 49 04 LMP I said you want to set DELTA-V_C, I suppose?

03 23 49 08 CDR Ah, let's set - Yes, better - Your 100 is probably good. DELTA-V_C should be 3.1.

03 23 49 15 CMP Yes, let's -

03 23 49 22 CDR You know what? That's yours.

03 23 49 31 CMP Okay, 3.1. I've got a 103.1 set in there.

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03 23 49 35 LMP Okay. EMS FUNCTION, DELTA-V.

03 23 49 36 CDR DELTA-V.

03 23 49 39 LMP Okay, do you want to trim it?

03 23 49 42 CDR Yes, we might as well. Get it all in plus-X. Okay?

03 23 49 46 CMP Yes. Okay, push up close to ... Yes.

03 23 49 55 CDR Okay, burn time is 20 seconds.

03 23 50 00 CMP Okay.

03 23 50 01 LMP Spacecraft roll alined, Al?

03 23 50 04 CMP Alined.

03 23 50 06 LMP SPACECRAFT CONTROL, CMC in AUTO.

03 23 50 08 CMP CMC, AUTO.

03 23 50 09 LMP MANUAL ATTITUDE, three, to RATE COMMAND.

03 23 50 11 CDR RATE COMMAND.

03 23 50 12 LMP DEADBAND, MIN.

03 23 50 13 CDR MIN.

03 23 50 14 LMP RATE, LOW.

03 23 50 15 CDR LOW.

03 23 50 16 LMP BMAG MODE, three, ATT 1/RATE 2.

03 23 50 17 CDR ATT 1/RATE 2. Welllll - -

03 23 50 18 LMP GDC ALIGN.

03 23 50 20 CDR What happened to your TRANSLATION CONTROL POWER?

03 23 50 23 CMP Yes, that's what I'm wondering.

03 23 50 24 CDR Where's the THC POWER? Well, now -

03 23 50 29 LMP Get that down there.

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[REDACTED]

03 23 50 30 CDR Oh, down there? Okay.

03 23 50 31 LMP Five minutes.

03 23 50 32 CDR (Sigh)

03 23 50 33 CMP Why - why go ATT 1/RATE 2, though?

03 23 50 34 LMP Do it for a GDC ALIGN. That doesn't make sense.

03 23 50 37 CDR No? No, it sure doesn't, does it?

03 23 50 39 CMP Why the GDC ...?

03 23 50 55 LMP And we're standing by for 5 minutes.

03 23 50 58 CMP Okay, we're at 6 minutes.

03 23 51 21 CMP Have you timed this thing, Dave?

03 23 51 23 CDR Yes.

03 23 51 24 CMP Okay.

03 23 51 35 CMP GDC alined.

03 23 51 37 LMP Okay. Standing by for 5 minutes.

03 23 51 39 CMP Okay, we're at 5 minutes.

03 23 51 40 CDR Okay, at some point you got to go ATTITUDE 1/
RATE 2 to have your SPS - -

03 23 51 46 CMP Right.

03 23 51 47 CDR - - in attitude hold. Let's not call down anymore.
So you might as well do it now.

03 23 51 51 LMP ... ATT 1/RATE 2, ... 42, GDC ALIGN.

03 23 51 54 CMP I don't understand that.

03 23 51 56 CDR I don't either.

03 23 51 57 CMP Okay, we're in ATT 1/RATE 2, just in case we need it.

03 23 52 04 CDR Okay, we're at 5.

[REDACTED]

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Day 4

03 23 52 05 LMP Okay, TRANSLATION CONTROL POWER, on.

03 23 52 08 CMP TRANSLATION CONTROL POWER, on.

03 23 52 09 LMP Hand controllers, armed.

03 23 52 11 CMP Armed.

03 23 52 15 LMP Okay. Did you get the 85 display? I guess it's - -

03 23 52 18 CMP Yes.

03 23 52 19 LMP - - ...

03 23 52 20 CMP I got the ... right now.

03 23 52 25 CDR Okay. After the burn, there's not much. I think we're in good shape. I'll tell you what we might do. After the burn, let's pressurize the LM.

03 23 52 41 CMP Yes.

03 23 52 42 CDR And let you get suited. And it might be better if you just pull your suit out and stuck it in the corner and got all that stuff out of the tunnel. ..., we can put it here and - -

03 23 52 54 CMP Yes.

03 23 52 55 CDR - - down under that couch, where we've been putting it.

03 23 52 56 CMP And try to ... it back. Yes.

03 23 52 58 CDR Yes, and I think there's enough room for you to get suited there.

03 23 53 01 CMP Yes, I think so.

03 23 53 02 CDR Then we can start working on that ... I'd like to do that landing site thing - the P24.

03 23 53 22 LMP And I'll be getting all the transfer gear.

03 23 53 24 CDR Yes, get all the transfer gear. Yes. As a matter of fact, you can start taking it over, once we get the tunnel opened up.

03 23 53 31 LMP Yes.

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03 23 53 32 CMP Boy, I tell you, we go by that landing site awful fast.

03 23 53 36 CDR We really do.

03 23 53 37 CMP Yes, you really go zipping by.

03 23 53 38 CDR Did you get a good picture of it?

03 23 53 39 CMP No.

03 23 53 40 LMP It was a little too dark.

03 23 53 41 CMP I just - All I could do was point down, and I just picked up the rille going past the edge of the window. I was just too slow getting to it, so - I knew I didn't have much time, but I didn't know it was that fast. I didn't realize we were going to get through it that quickly.

03 23 53 55 CDR Did it look low?

03 23 53 56 LMP Yes.

03 23 53 57 CDR Yes. You know, doggone it - -

03 23 53 58 LMP The sector's right there, boy.

03 23 53 59 CDR - - ... In the LM when - when we'd do that, we'd run it several times across PDI with the window. We should have done that in the LMS with you. I didn't - I didn't - -

03 23 54 07 CMP We did.

03 23 54 08 CDR - - ... about the - No, you never came over there and watched us do it from 9 miles.

03 23 54 11 CMP Oh, I - -

03 23 54 12 CDR ...

03 23 54 13 CMP Oh, I see. Yes.

03 23 54 14 CDR Because it really moves.

03 23 54 15 CMP Yes.

03 23 54 16 CDR Really give you a feeling for it.

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03 23 54 17 CMP Yes.

03 23 54 18 CDR I never thought about the TV pass, though, to tell you the truth.

03 23 54 30 CDR Tell them it went awful fast?

03 23 54 33 LMP They could tell, I think (laughter).

03 23 54 34 CMP Yes.

03 23 54 36 CDR Could you - did you have any - -

03 23 54 37 CMP Well, all - all I could do was stick it in the window and catch - catch the rille going out of the edge of the picture, and that was it, Dave. So, all I saw was - all I saw was St. George and - and Elbow Crater.

03 23 54 47 CDR Could you see them?

03 23 54 48 CMP Yes. And they were gone.

03 23 54 51 CDR Did you get a good chance to point it at the Apennines coming up, though?

03 23 54 55 CMP Yes. Yes.

03 23 54 56 CDR Did you see the mountains on the horizon and all that stuff?

03 23 54 58 CMP Yes.

03 23 54 59 CDR Well, that ought to be pretty impressive. Well, we're down to 2 minutes, Jimmy.

03 23 55 14 CDR And don't - don't forget on that Activation Checklist that one of them has that ECS stuff, and the other's got - Make sure we have both of those. Yes.

03 23 55 44 CDR One minute. Okay, 20-second burn ... Jim will count because your clock is sort of ...

03 23 55 56 CMP Yes. ... - -

03 23 55 57 CDR ... on that, Jim?

03 23 56 29 SC ...

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[REDACTED]

03 23 56 30 CMP Okay.

03 23 56 31 LMP ...

03 23 56 32 CMP 43.

03 23 56 33 LMP Roger.

03 23 56 36 CDR Ten seconds. Ready -

03 23 56 45 CDR MARK; the burn time. DSKY's count?

03 23 56 51 CMP Roger. So is the EMS.

03 23 56 54 LMP Here's the countdown. ... 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and -

03 23 57 05 LMP ZERO.

03 23 57 06 CDR Now trim it a little bit. Yes, that's ... That's good, Al. ...

03 23 57 10 CMP What did they want it trimmed to?

03 23 57 12 CDR They didn't say. Why don't you - Could you take that to 3/10ths?

03 23 57 14 LMP They didn't want us to trim any - -

03 23 57 16 CMP That's for retrograde ...

03 23 57 18 CDR There you go.

03 23 57 19 CMP Okay.

03 23 57 20 CDR .1, .2, and .0.

03 23 57 23 CMP Okay.

03 23 57 24 CDR Okay, we got everything?

03 23 57 25 CMP Whoo.

03 23 57 26 CDR All the data?

03 23 57 27 CMP Yes.

03 23 57 29 CDR Okay. EMS FUNCTION, OFF.

[REDACTED]

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03 23 57 32 CMP OFF.

03 23 57 33 CDR EMS MODE, STANDBY.

03 23 57 35 CMP STANDBY.

03 23 57 36 CDR RHC and a THC, lock.

03 23 57 37 LMP Lock.

03 23 57 39 CDR TRANSLATION CONTROL POWER, OFF.

03 23 57 41 CMP OFF.

03 23 57 44 CDR We got a POO after that?

03 23 57 45 LMP Yes - yes.

03 23 57 47 CDR POO and a VERB 66.

03 23 57 49 CMP Okay.

03 23 57 50 CDR ROT CONTROL POWER, DIRECT, OFF.

03 23 57 52 CMP DIRECT, OFF.

03 23 57 53 CDR BMAG MODE, three, RATE 2.

03 23 57 54 CMP RATE 2.

03 23 57 55 LMP TAPE RECORDER going off.

03 23 59 08 CDR ...?

03 23 59 09 CMP ...

03 23 59 10 CDR Okay, there's a maneuver to P52 high-gain attitude. FDOI [sic] trim required; roll, pitch, and yaw. Well, beautiful, they didn't give us that one. Did they? Did they give us an attitude to go to, Jim - after the burn?

03 23 59 29 LMP No, I don't think so. It's not on the pad.

03 23 59 45 CMP We don't have it. Huh.

03 23 59 57 CMP Well, for God sakes. They forgot it completely.

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DAY 5

04 00 00 06 CDR Okay. They're not too with us this morning.

04 00 00 09 CMP What - what kind of high-gain antenna angles do we get in this attitude?

04 00 00 15 LMP Why don't you look for it - -

04 00 00 16 CMP We'll just stay here.

04 00 00 17 LMP - - ... 142?

04 00 00 18 CMP Let's look in the book and see if that's in a clear area.

04 00 00 21 CDR Which book? Where's the ... at?

04 00 00 23 LMP Right up there. Do you want - want to clean up of SIM bay here, Dave?

04 00 00 29 CDR Yes, okay. X-RAY to STANDBY.

04 00 00 33 LMP X-RAY to STANDBY.

04 00 00 34 CDR X-RAY - ALPHA RAY/X DOOR to ALPHA ON.

04 00 00 38 LMP Okay, that is ALPHA ON.

04 00 00 40 CDR Okay. GAMMA RAY, EXPERIMENT, ON.

04 00 00 43 LMP GAMMA RAY, EXPERIMENT, ON.

04 00 00 46 CDR GAINSTEP to shield on.

04 00 00 48 LMP GAINSTEP to shield on.

04 00 00 50 CDR MASS SPEC - -

04 00 00 51 LMP Wait, hold it. GAINSTEP to shield on?

04 00 00 53 CDR Yes.

04 00 00 54 LMP Is that the midprogression?

04 00 00 55 CDR I don't know. What is it?

04 00 00 56 LMP It's the SHIELD OFF, down.

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04 00 00 58 CDR What's that?

04 00 00 59 CMP Shield on for the GAINSTEP.

04 00 01 02 CDR Which position is that?

04 00 01 05 CMP Center.

04 00 01 06 LMP Okay, the shield's on.

04 00 01 07 CDR I don't know. It doesn't say that over there.

04 00 01 08 CMP GAINSTEP is in up.

04 00 01 10 CDR Okay, MASS SPEC EXPERIMENT to STANDBY.

04 00 01 14 LMP Okay, MASS SPEC EXPERIMENT is STANDBY.

04 00 01 19 CDR PAN CAMERA to off.

04 00 01 23 LMP PAN CAMERA - You got the mode? For the PAN CAMERA ... - -

04 00 01 29 CMP It's the ... POWER.

04 00 01 30 CDR Oh, POWER - PAN CAMERA POWER to off. I'm sorry.

04 00 01 32 LMP Verified.

04 00 01 33 CDR All right, that's all.

04 00 01 35 LMP Okay.

04 00 01 52 CDR Okay, let's -

04 00 01 55 LMP What does that look like? I said that to you.

04 00 02 06 CDR Oh, my. Well, let's see. Getting range and no coverage, though. Next thing we go to is landing-site observation attitude at 96:55, which is 015, 290, and 000. So that ought to be a good attitude. You see we come down through here and do all that.

04 00 02 31 CMP Yes.

04 00 02 32 CDR I guess we'd better - -

04 00 02 33 CMP Well, we don't have anything else, do we?

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[REDACTED]

04 00 02 35 CDR S-band. Says P52 HGA attitude, if DOI trim required. Well, we'll give it to him. And the next attitude we have to do - it looks stable for maneuver, because they're surely to give us a - an extra maneuver.

04 00 02 52 CMP ...

04 00 02 57 CDR They didn't give us that. Here we come around here, and the next thing we have to do is burn status - maneuver to this attitude. Okay?

04 00 03 06 CMP Yes.

04 00 03 07 CDR So let's - let's go there.

04 00 03 08 CMP That'll be Charlie there, huh? That's not a good - that's not a good high-gain attitude.

04 00 03 21 CDR It's not?

04 00 03 22 CMP But it's better than the one we've got, though.

04 00 03 24 CDR How can you tell we're there?

04 00 03 25 CMP Huh? Well, the landing-site observation attitude is not a good high gain.

04 00 03 29 CDR Oh, it's not?

04 00 03 30 CMP Huh-uh. The high - -

04 00 03 32 CDR Well, let's - -

04 00 03 33 CMP - - That's - that's corrected better than what we've got.

04 00 03 34 CDR Well, we got OMNI now, anyway, don't we?

04 00 03 36 CMP Yes. Now we can just sit here. You've got OMNI B here or OMNI Charlie in that other attitude.

04 00 03 45 CDR Let's see, we have AOS at 96:30. Okay, and then we only got 20 minutes to maneuver. I guess you're right. I guess that would be better than - kind of - We only have OMNI, but that's too bad, I guess. But at least it's better than this one.

04 00 04 06 CMP Yes.

[REDACTED]

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04 00 04 16 CDR 290, 0 ... the whole 180 degrees down ...

04 00 04 29 LMP Got a long ways to go.

04 00 04 30 CDR So we might as well do it. Go to ... Okay. Next order of business is the tunnel.

04 00 04 49 LMP Al, I want to change lightweights with you. I'm going off comm.

04 00 05 15 CMP Okay, and I'd better put some biomed on.

04 00 05 17 CDR Oh, yes, that's right. Why don't -

04 00 05 33 CDR You're going to have some time - Oh, you got to get your suit on.

04 00 05 46 CDR Why don't - why don't we do the tunnel and get that stuff in here. I don't think it's going to be in the way too much, once we get your suit out of the way. Oh, do your biomed stuff, and we'll get all the transfer stuff together. Then we'll have it all, and we won't have to do any more shuffling.

04 00 06 16 CDR I - I'll get it. Jim, go ahead and get the transfer stuff. I'll - That's the wrong thing, Jim. You're in the right wall.

04 00 06 38 CDR Need any help, Jimmy? What - UCW2 [?]. Oh, that thing. Yes, okay. Where it is? I'll go get it. Oh, I know where it is; it's in A-8.

04 00 07 13 CDR Whew. (Clanking)

04 00 07 35 CDR There we go. (Clanking)

04 00 07 52 CDR What happened?

04 00 08 07 LMP ...

04 00 08 10 CDR Okay. (Clanking)

04 00 08 37 CDR Did you leave Al one jettison bag?

04 00 08 44 LMP Okay, I'll check.

04 00 08 47 CDR Okay. How many did you have to start with?

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04 00 09 05 CDR (Clanking) No, I really guess not. Okay, we'll just take one. Okay, LM Data File, huh? What should - what should be in it, Jim? Huh? Yes. I know this is in it; I saw it the other day.

04 00 09 33 LMP ...

04 00 09 35 CDR No, it's - it's an extra one of ours. I had - that's a backup. Command module. I had them put on. (Laughter) It's the only kind I understand. It's not going to work (laughter). Here, I know where I'll put it, right in here. Right there.

04 00 10 01 LMP ...

04 00 10 08 CDR Okay, let's check it.

04 00 10 27 CDR Time line. Go. Data Card Book. Go. Okay, go.

04 00 10 41 LMP ...

04 00 10 42 CDR Got it.

04 00 10 43 LMP ...

04 00 10 45 CDR Got it.

04 00 10 46 LMP ...

04 00 10 47 CDR Star charts; you have them.

04 00 11 04 LMP Get the ...

04 00 11 08 CDR All right. I'd like to time it ...

04 00 11 26 (Clanking)

04 00 11 39 CDR Maybe I got a PRD, Jim.

04 00 11 55 (Clanking)

04 00 12 17 CDR There it is. I've got to get Al's, really. Yes.

04 00 12 37 CDR What?

04 00 12 39 LMP ...

04 00 12 41 CDR It wasn't? Why? Really? Oh, let me write this stupid thing down.

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04 00 13 07 LMP ...

04 00 13 13 CDR Do you know where your PRD is, Al? Yes, give me to it [sic]. I'm switching you right now.

04 00 13 35 (Clanking)

04 00 13 37 CDR Some day they may want these readings. They're in here. They're in here at the beginning of the day, if you ever get around to it. Okay, Jim, my PRD. I thought I just handed you one. Huh?

04 00 14 11 LMP ...

04 00 14 31 CDR Oh, shoot, I don't see it, Jim. No, don't check it off; we'll look for it, as we go around. Oh, is that the list you're checking? Oh, come on. Okay. Yes. Yes, I put mine on. Yes.

04 00 15 11 LMP ...

04 00 15 14 CDR Yes, we're - Yes, but - Yes, okay. I've got mine in my pocket. Okay. Yes. Got that? Yes. Yes.

04 00 15 42 LMP ...

04 00 15 44 CDR Okay, yes - yes. What I - We also want to take these over and bring the new ones back. CWGs.

04 00 16 04 LMP ...

04 00 16 07 CDR Yes.

04 00 16 11 LMP ...

04 00 16 14 CDR Yes.

04 00 16 15 LMP ...

04 00 16 28 CDR Yes. Yes, we have them on.

04 00 16 31 LMP ...

04 00 16 33 CDR I'm going to have mine in my pocket, in this thing when I bring it over. So I got mine. Do you want to take yours? Okay, it's in the tube, Jim.

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04 00 16 48 LMP ...

04 00 16 50 CDR Yes.

04 00 16 53 LMP ...

04 00 16 58 CDR Yes. I was going to put them in my pocket, too, before I got hooked around. Here, I can stick it in this pocket up here - in my strap-on pocket. When are we going to put them over there? Okay.

04 00 17 20 LMP ...

04 00 17 22 CDR Yes, okay.

04 00 17 24 LMP ...

04 00 17 25 CDR Yes, got mine ready to snap on.

04 00 17 27 LMP ...

04 00 17 30 CDR Okay.

04 00 17 32 LMP ...

04 00 17 36 CDR Yes.

04 00 17 38 LMP ...

04 00 17 39 CDR Okay.

04 00 17 41 LMP ...

04 00 17 47 CDR We got both Activation Checklists? Sure, huh? Okay.

04 00 18 12 CDR Huh?

04 00 18 13 LMP ...

04 00 18 14 CDR Yes. Well, all right. We're going to go early.

04 00 18 20 LMP ...

04 00 18 27 (Clanking)

04 00 18 35 LMP ...

04 00 18 39 CDR I'll put it in R-3.

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04 00 18 51 CDR The what?

04 00 19 35 (Clanking)

04 00 19 54 LMP Get all ...?

04 00 19 56 CDR Yes.

04 00 19 57 LMP ...

04 00 19 59 CDR Okay.

04 00 20 05 (Clanking)

04 00 20 07 CDR Yes.

04 00 20 08 (Clanking)

04 00 20 49 CDR Well, I don't think we've left you with too much to do, Al. I hope not. Keep an eye on those guys down there.

04 00 21 02 CMP ...

04 00 21 05 CDR Huh?

04 00 21 06 CMP ...

04 00 21 08 CDR Yes, they really have.

04 00 21 12 CMP ... watch the systems ...

04 00 21 17 CDR Let them watch the systems and you do the flying, which is the way it ought to be.

04 00 21 43 (Clanking)

04 00 22 22 LMP ... all through down there?

04 00 22 35 (Clanking)

04 00 22 42 LMP ...

04 00 23 06 LMP ... wait a minute ...

04 00 23 15 LMP Yes.

04 00 23 18 CDR Jim, here's your - thing.

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[REDACTED]

04 00 23 53 LMP ...

04 00 24 55 (Clanking)

04 00 25 12 LMP ...

04 00 25 16 (Clanking)

04 00 25 36 LMP ...

04 00 25 39 (Clanking)

04 00 26 20 CDR ... Is this your ..., Jim?

04 00 26 29 LMP No, I've got it. ...

04 00 26 33 CDR ...

04 00 26 35 (Clanking)

04 00 27 00 (Clanking)

04 00 27 29 CDR Okay, I guess the - next thing we ought to do - when you get ready - is go through the tunnel. No, I don't need that. Systems Checklist.

04 00 27 58 LMP I think you had the Systems Checklist, didn't you? Oh, here it is. Okay. Well, that's your job, because - Say again?

04 00 28 15 CMP ...

04 00 28 18 LMP Yes.

04 00 28 34 (Clanking)

04 00 28 42 CDR Think we ought to try and get them on the high gain? Hey, Al, you think we ought to try to get them on the high gain?

04 00 29 36 CDR Well -

04 00 29 37 LMP I mean - Okay. I could easily go through it, because I could tell which ones to check - skip through. ... get.

04 00 29 50 CDR Turn around here, Jim.

[REDACTED]

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Day 5

04 00 30 00 CDR Hey, we're getting them. How about that. Yes. There, got a lock.

04 00 30 13 CDR Roger. Houston; 15 here. We had a good burn and have a burn report for you.

04 00 30 23 CDR Okay. On time; burn time was about 18 or 19 seconds. The residuals were minus .1, plus .2, plus .2; DELTA-V_C was plus .8, and the G&N has us in a 59.4 by 10.3.

TIME SKIP

04 01 54 08 CMP (Yelling) In case you guys are wondering, I'm dumping.

04 02 03 00 CMP Fuel cell purge, huh? Okay, fuel cell purge. Two for 2 hours. Two of them on.

04 02 03 59 CMP (Yelling) Hey, we're going to maneuver.

04 02 05 09 CMP Yes, must be ... low.

TIME SKIP

04 02 16 50 CDR ...?

04 02 16 52 CMP Well, we're getting there. Slowly.

04 02 16 58 CDR What?

04 02 16 59 CMP We're getting there slowly.

04 02 17 01 CDR ...

04 02 17 04 CMP Yes. I think so.

04 02 17 12 CDR When you almost get there, how about ...?

04 02 17 19 CMP Okay.

04 02 17 21 CDR ...

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04 02 17 22 CMP All right.

04 02 17 23 CDR ... coming up ... to AOS ... up to - be ready for AOS.

04 02 17 31 CMP I think I'm just about ready.

04 02 17 36 CDR ...

04 02 17 39 CMP Yes. Where is the tape? Anybody know?

04 02 17 44 CDR It's over - ...

04 02 17 48 CMP Okay.

04 02 17 50 CDR ...

04 02 20 13 CMP ...

04 02 20 33 CMP Oh, what the hell.

04 02 21 40 CDR Hey, Al.

04 02 21 41 CMP (Yelling) Yes.

04 02 21 46 CDR ...

04 02 21 47 CMP (Yelling) What?

04 02 21 55 CDR ...

04 02 21 57 CMP (Yelling) What?

04 02 21 58 CDR Did you ...?

04 02 22 00 CMP (Yelling) No. You guys are too far ahead.

04 02 22 58 CMP Okay. Let's see.

04 02 23 02 CDR Ready?

04 02 23 03 CMP You want P - Okay.

04 02 23 04 CDR ...

04 02 23 06 CMP Okay.

04 02 23 21 CDR ~~Okay~~, there, Endeavour How do you read the Falcon on - -

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04 02 23 23 CMP Hey, loud and clear.

04 02 23 24 CDR Say again?

04 02 23 25 CMP Beautiful!

04 02 23 26 CDR Good.

04 02 23 27 LMP And, Al, how do you read me?

04 02 23 28 CMP Read you loud and clear, Jim.

04 02 23 30 LMP Ah, you're beautiful.

04 02 23 31 CMP Hey, did you say something about T_{ephem}? Did you want a T_{ephem}, Dave?

04 02 23 38 CDR Stand by.

04 02 23 39 CMP Okay. I'll give it to you if you want.

04 02 23 43 CDR Stand by. Configure for SIMPLEX A.

04 02 23 45 CMP Okay.

04 02 23 57 CDR Okay, Al. How do you read on A?

04 02 23 59 CMP Loud and clear, Dave.

04 02 24 00 CDR That's nice.

04 02 24 01 LMP And, Al, how do you read me?

04 02 24 02 CMP Loud and clear, Jim.

04 02 24 03 LMP Very good.

04 02 24 05 CDR Okay. Now you can give me your T_{ephem}.

04 02 24 07 CMP Okay.

04 02 24 18 CMP Ready to copy?

04 02 24 19 CDR Go.

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04 02 24 20 CMP Just like SIM. All balls in the R₁. R₂ is 32251. R₃ is 26157.

04 02 24 31 CDR Okay. All balls, 32251, 26157.

04 02 24 34 CMP Great.

04 02 24 44 CMP Want a clock sync?

04 02 24 46 CDR Stand by 1.

04 02 25 32 CDR Okay, Al. VERB 06 - 6 - VERB 06 NOUN 65. I'll give you a mark.

04 02 25 37 CMP Give me a mark. I'm waiting.

04 02 25 43 CDR 3, 2, 1 -

04 02 25 45 CDR MARK.

04 02 25 46 CMP Okay. 98:25:45.60.

04 02 25 53 CDR Okay. 25:45.60.

04 02 25 56 CMP Roger.

04 02 26 06 CMP And I'm coming up to get the umbilical now.

04 02 26 08 CDR Read you loud and clear.

04 02 26 19 LMP Okay. Let's hope so.

04 02 26 48 CDR Okay, Endeavour. Another NOUN 65 if you're ready.

04 02 26 56 CMP On your mark.

04 02 26 58 CDR 3, 2, 1 -

04 02 27 00 CDR MARK.

04 02 27 01 CMP Okay. 98:26:59.60.

04 02 27 07 CDR Okay. We're within 3/100ths.

04 02 27 10 CMP Okay.

04 02 27 44 CMP Hello, Endeavour - Houston, this is Endeavour, loud and clear.

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04 02 27 58 CMP Okay, you got it. NARROW and REACQ.

TIME SKIP

04 03 29 32 CDR Okay. Understand, Al. Get the DAP reset, and the tape meter looks like it works fine.

04 03 31 28 CMP Okay, Falcon; Endeavour. I got the hatch in and - you want to verify your hatch closed?

04 03 31 35 CDR Okay, that's verified. Closed and locked.

04 03 31 37 CMP Okay, I'll do a hatch integrity check then.

04 03 31 40 CDR Okay.

04 03 32 43 CDR Okay, Endeavour; Falcon. Our radar checks out okay, and your B-3, OFF, and transponder, off, are no longer required.

04 03 32 49 CMP Okay. Thank you.

04 03 32 53 LMP And, Al, we're going B data.

04 03 33 00 CMP Okay.

04 03 38 34 CMP Falcon, Endeavour. Your transponder checked out okay.

04 03 38 37 CDR Oh, very good. Thank you.

04 03 47 15 CMP Okay, Falcon; Endeavour. We're maneuvering to SEP attitude.

04 03 47 19 CDR Okay.

04 03 47 30 CDR Okay, Endeavour; Falcon. Have you vented the tunnel?

04 03 47 33 CMP Roger.

04 03 47 34 CDR Okay; thank you.

04 03 47 53 CDR Hear that noise with us, Al?

04 03 47 58 CMP Okay.

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04 03 57 59 CDR Okay, Al, are you about in attitude now?

04 03 58 03 CMP Right, Dave. About 5 degrees to go.

04 03 58 05 CDR Okay. We're down to - -

04 03 58 09 LMP Oh, yes. We should - -

04 03 58 10 CDR - - just about everything and it's all shipshape.

04 03 58 13 CMP Good.

04 03 58 21 CDR Even the old broken tape meter seems to work.

04 03 58 27 LMP That figures.

04 03 58 58 CMP Okay, we're at attitude now.

04 03 59 01 CDR Okay; thank you.

04 04 03 15 CMP Okay, Falcon; Endeavour. Doing the trim maneuver.

04 04 03 18 CDR Okay.

04 04 03 53 CMP Okay. We're setting at attitude and I've got 10 minutes -

04 04 03 56 CMP MARK - to go.

04 04 03 57 LMP Okay, we're right with you.

04 04 04 09 CDR And we're right on the attitude.

04 04 04 11 CMP Okay, good.

04 04 04 49 CDR Okay, Al, at 5 minutes to go, we need a - 06 20. Okay?

04 04 04 56 CMP Okay, you want it now?

04 04 04 59 CDR No, let's wait down until 5 minutes. Okay?

04 04 05 02 CMP Okay.

04 04 05 03 CDR I'd like to give them as much time on the platform as we can.

04 04 08 44 CMP Coming up on 5 minutes in 10 seconds.

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04 04 08 46 CDR Okay, I'll give you a mark.
04 04 08 53 CDR 3, 2, 1 -
04 04 08 55 CDR MARK.
04 04 08 57 CMP Okay. 35975, 10818, 35995.
04 04 09 10 CDR Give me that last one again.
04 04 09 11 CMP Okay. 35995.
04 04 09 17 CDR Okay. 35915, 10818, 35995.
04 04 09 24 CMP The last two were okay. The first one was 35975.
04 04 09 29 CDR Okay; 75. I don't write too good with gloves on.
04 04 09 32 CMP Roger.

TIME SKIP

04 04 38 58 CMP Ten seconds.
04 04 39 00 CDR Roger.
04 04 39 17 CDR Okay, we're on the capture latches. Good.
04 04 39 20 CMP Roger.
04 04 39 34 LMP And you're on your own.
04 04 39 40 CDR Okay. Good clean SEP.
04 04 40 28 CMP Okay, Ed; if you think we can't get there for the P24.
04 04 40 40 CMP Okay. We'll hold this.
04 04 40 43 LMP Okay. Falcon's going to yaw left.
04 04 41 32 CDR Okay. Falcon's going to pitch up 90.
04 04 41 34 CMP Roger.
04 04 41 57 CMP And you got four good-looking gear.

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04 04 42 27 CMP And, Falcon; Endeavour. Looks like you got one radar there that's - rotating quite freely.

04 04 42 39 CDR Okay. We've got you in sight; we're looking straight at you. It's really pretty.

04 04 42 43 CMP Roger.

04 04 43 55 CDR Roger. We're LO bit rate and AFT OMNI.

04 04 45 17 LMP Roger. PITCH, 155; YAW, minus 50.

04 04 47 45 LMP Roger. HI bit rate.

04 04 47 49 CDR And, Houston, we're ready to go with the DPS throttle check whenever you are.

04 04 47 58 CDR Okay.

TIME SKIP

04 05 24 10 LMP Al, we're going to DATA.

04 05 24 12 CMP Okay, Jim. Recorder's running.

04 05 24 18 CDR Okay, nice recovery over there.

04 05 24 23 CMP Think I'm minus at least one fingernail, though.

04 05 24 25 CDR Oh, gad. Where did you lose it?

04 05 24 33 CMP On - as a matter of fact, on A-1 when I went after the sextant adapter.

04 05 24 39 CDR Oh, my!

04 05 24 40 CMP (Laughter) That's okay, just a little loose.

04 05 24 51 CDR So long as you're not leaking.

04 05 24 54 CMP I'm not, no. Okay, I'm all set up for the burn here, I've done P40, done the sextant star check, and everything's looking pretty good. And I've got 14 minutes to go.

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Day 5

04 05 25 05 CDR Okay, very good. Oh, yes, I wanted to tell you a little bit about the landing site there - on the - on the craters. There's a - Earthlight Crater, of course, is a lot sharper than Index. And then there's a great big one to the east of Index, which is the same size and quite sharp, and I think - you won't have any trouble as long as you see the Matthew, Mark, Luke, and Index. Index is a pretty subtle crater, and there probably won't be much shadow in the bottom of it at all, when you get there.

04 05 25 38 CMP Yes. Okay. I - I - I know where it is, I think, well enough in location so I can look for the - for the shallow depression.

04 05 25 45 CDR Okay. Both of those will probably have shadow in them.

04 05 25 48 CMP Yes.

04 05 25 51 CDR But - gee, they're real super; you can't miss.

04 05 32 52 CMP Falcon, Endeavour.

04 05 32 55 CDR Go ahead, Al.

04 05 32 56 CMP Okay, do you want the NOUN 81 values for this burn now, or do you want to wait until after?

04 05 33 01 CDR After.

04 05 35 27 CMP Okay, I've gone through the primary gimbal check and turning on number 2 now.

04 05 35 31 CDR Roger.

04 05 36 30 CMP Gimbal drive check.

04 05 36 33 CDR *** we feel like we're right there with you.

04 05 36 35 CMP All looks normal.

04 05 36 37 CDR Good show.

04 05 36 39 CMP FDAI scale 5/5. RATE, HIGH, and looks like we're going.

04 05 36 44 CDR Good.

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04 05 36 45 CMP Everything checks fine; 2 minutes and 12 seconds.

04 05 36 48 CDR Okay.

04 05 37 15 CMP Okay. DELTA-V THRUST B is ON. And B PILOT VALVE is closed.

04 05 37 20 CDR Okay.

04 05 37 57 CMP One minute.

04 05 37 59 CDR Right with you on the time.

04 05 38 24 CMP Average g.

04 05 38 26 CDR Roger.

04 05 38 44 CMP ULLAGE.

04 05 38 54 CMP Thank you.

04 05 38 59 CMP THRUST, ON.

04 05 39 02 CMP THRUST, off. What a kick in the tail!

04 05 39 06 CDR Didn't I tell you?

04 05 39 07 CMP You did! Had to see it for myself.

04 05 39 10 CDR That's great, isn't it?

04 05 39 12 CMP Fantastic, man; you really move!

04 05 39 14 CDR Yes, man. That's like really flying, isn't it?

04 05 39 17 CMP Yes, sir.

04 05 41 20 CDR Did you get it all in, Al?

04 05 41 23 CMP Sure did, Dave. Right down to the gnat.

04 05 41 26 CDR Very good.

04 05 41 27 CMP Sorry about that. I had - only had 9/10ths residual in X and I - I trimmed it out. That short burn constant made it a lot better.

04 05 41 36 CDR Good.

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04 05 41 38 CMP And I'm in a 65.2 by 54.8.
04 05 41 43 CDR 65.2, 54.8. Okay.
04 05 42 19 CDR How about that! We have you in a 65.2 by 54.6.
04 05 42 23 CMP Super.
04 05 45 12 CDR Al, how do you read now?
04 05 45 14 CMP I read you 5 square, Dave.
04 05 45 16 CDR Okay. We had an antenna change called here and sounds like you're pretty good, so we'll just stay with you this way.
04 05 45 24 CMP Okay.
04 05 46 36 CMP Now.

TIME SKIP

04 06 12 48 CMP Hello, Houston; Endeavour. Roger. Stand by 1.
04 06 12 56 CMP Okay, Houston. The burn got off on time. Burn time, 4 seconds, V_{GX} was minus 0000.9, and I trimmed that to - zero - -

TIME SKIP

04 08 06 02 LMP Houston, Falcon. Go.
04 08 06 14 LMP Roger, Ed. The ASCENT BATs were on at 103:50:45, and I'll check ED BATs now.
04 08 06 50 LMP And, Houston, this is Falcon. ED batteries both check at 37 volts.
04 08 07 04 LMP And LMP. Go ahead.
04 08 07 17 LMP POO and DATA. And go ahead with the pad.
04 08 07 32 LMP Yes? Okay.

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04 08 07 54 LMP Ed, if you're reading us, you ought to call us after the - the up-link. We cannot read you. We're not getting the up-link either.

04 08 08 13 CDR Locked up yet?

04 08 08 14 LMP No.

04 08 08 18 CDR Here it comes; don't change it. It's coming in.

04 08 08 33 LMP THROTTLE control, AUTO.

04 08 08 35 CDR AUTO. Read you loud and clear, Ed. I'm ready for that update now.

04 08 09 10 LMP Roger. 104:30:08. 54; cross range, plus 0003.3; DEDA 231, plus 56943.

04 08 09 36 LMP Roger. Okay, your T - your THROTTLE in min? Okay. THROTTLE, min.

04 08 09 48 CDR Okay.

04 08 09 49 LMP THROTTLE, soft stop.

04 08 09 51 CDR Okay.

04 08 09 52 LMP RATE SCALE, 25 DEGREES PER SECOND.

04 08 09 54 CDR 25.

04 08 09 55 LMP ATTITUDE/TRANSLATION, 4 JET.

04 08 09 56 CDR 4.

04 08 09 57 LMP Check DPS, APS, RCS, ECS, EPS. Okay?

04 08 10 03 CDR Looks all right.

04 08 10 18 CDR Did you check the RCS? Okay. ECS look all right?

04 08 10 27 LMP Yes.

04 08 10 52 LMP If we should be up-linked, Dave, I'll need a - VERB 47.

04 08 10 57 CDR Okay.

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04 08 12 01 LMP ... computer, because -

04 08 12 06 CMP Roger. Thank you.

04 08 12 08 CDR Thirty-nine point - How's that?

04 08 12 09 SC (Tone)

04 08 12 20 CDR (Laughter) ENTER.

04 08 12 48 CDR Okay. Looks like I just screwed. Okay.

04 08 13 38 LMP Okay. That's good.

04 08 14 30 LMP Get - I think we ENABLE on the - S-BAND?

04 08 14 34 CDR Okay. Houston, how do you read Falcon?

04 08 14 43 CMP Houston, Endeavour. Loud and clear.

TIME SKIP

04 23 03 22 CC *** while you work, I got a couple of short goodies ***

04 23 03 57 CMP Hey, that all sounds real good, Karl. And, as you can see, I'm right in the middle of a P52 here. We'll have the second star and gyro torquing angles in just a second.

04 23 04 48 CMP And if you've got those torquing angles, I'll get them on the minute.

04 23 05 04 CC *** read them down to us, Al.

04 23 05 06 CMP Okay, Karl, I'll read them to you. P52 stars were 01 and 36. The torquing angles were minus three balls 28, minus three balls 58, plus three balls 12. And they were torqued out at 119:05 on the minute.

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[REDACTED]

DAY 6

05 01 53 08 CMP Hello, Houston; 15 - Endeavour.
05 01 53 21 CC Endeavour, this is Houston. How do you read?
05 01 53 23 CMP I read you loud and clear.
05 01 55 32 CC Endeavour, this is Houston. How do you read? And we seem to have a small comm problem. Please stand by.
05 01 55 41 CMP Roger, Houston. Endeavour standing by, and I'm reading you 5 square. Houston, Endeavour is standing by, and I'm reading you 5 square.
05 01 55 55 CC Roger. And I'm reading you loud and clear with a good bit of noise over the top of you.
05 01 56 01 CMP Roger.

TIME SKIP

05 04 58 21 CMP Ah, ha!
05 04 59 10 CMP Hello, Houston; Endeavour. How do you read?
05 04 59 56 CMP Hello, Houston; Endeavour.
05 05 00 26 CC Endeavour, this is Houston. How do you read?
05 05 00 28 CMP Okay, Houston. It looks like we're just going over the hill here. Just wanted you to know, it looks like my mission timer on the main panel is shot.
05 05 00 44 CC Roger, Al. We read, and we would like to have COMMAND RESET and LOW BIT RATE.
05 05 00 50 CMP Roger. COMMAND RESET; LOW BIT RATE. The - the timer's - -
05 05 00 53 CC Probably - -

[REDACTED] TIME SKIP [REDACTED]
[REDACTED]

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Day 6

05 05 51 19 CC 15, this is Houston. We'd like to have you go WIDE BEAM on the HIGH GAIN ANTENNA and then to NARROW.

05 05 51 28 CMP Okay, Houston, this is Endeavour. Going WIDE BEAM; going back NARROW.

05 05 51 57 CC That's sounding better, Al. How are things going up there?

05 05 52 00 CMP Well, going okay, Karl. Looks like I've caught up a little bit, got all the dumps out of the way, and got the libration photography. It looks like I'm going to be handicapped a little bit because of the mission timer, but we'll press on.

05 05 52 17 CC All right. Our understanding on the mission timer is that, even though you tried to reset it, it still refused to count up. Is that correct?

05 05 52 24 CMP That's correct, and I thought what I'd do now is reset to zero and start.

05 05 52 34 CC Roger.

05 05 52 35 CMP Well, it counts from zero, Karl. I - -

05 05 52 37 CC And for future reference we'd like - Roger. You say it is counting, but it had - it had to start from zero to start counting again?

05 05 52 47 CMP Yes. Well, let me pick a random number, zero, count from there. I just tried to tell you the correct time, is all.

05 05 53 34 CMP Okay, Houston; Endeavour. Looks like we must have just run across a little funny there, Karl, because - it started okay now and is running.

05 05 53 46 CC Roger. Do you have a time source - -

TIME SKIP

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[REDACTED]

05 06 56 11 CC Very good, Al. That came through loud and clear.

05 06 56 57 CC Al, everybody down here is sending up bouquets to you for having done such a great job in a crowded period.

05 06 57 03 CMP Well, thank you very much, sir.

05 06 57 09 CC And all the systems down here are looking in good shape as you go around the corner.

05 06 57 12 CMP Okay, Karl. Thank you.

05 06 57 22 CMP Think I'll get something to eat.

TIME SKIP

05 07 47 44 CC Endeavour, we'd like to have a NARROW BEAM, please.

05 07 47 50 CMP NARROW BEAM.

TIME SKIP

05 09 48 17 CMP Houston, Endeavour. How do you read?

05 09 48 25 CMP Okay; reading you loud and clear, also.

05 09 49 09 CMP Stand by 1.

TIME SKIP

05 20 41 31 CMP - - and my PRD is 23149.

05 20 41 46 CMP And standing by for a consumables.

05 20 42 13 CMP Roger, Karl. Might as well get them now.

05 20 42 45 CMP Roger, Karl. 140:00; RCS total, 61, 61, 61, 59, and 61; H₂ tanks, 70, 70, 48; O₂ tanks, 75, 78, 60.

05 20 43 37 CMP Roger. Go ahead. I'll be doing a P52.

[REDACTED]

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05 20 44 14 CMP Well, that certainly sounds very good, Karl.

05 20 44 41 CMP Roger, Karl.

05 20 47 10 CMP And, Houston, if you're - -

05 20 50 35 CMP (Yawn)

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DAY 7

06 03 29 55 CC Endeavour, this is Houston. How do you read?

06 03 29 57 CMP Hello, Houston; Endeavour. Loud and clear.

06 03 30 03 CC Good to hear your cheery voice. How is everything up there?

06 03 30 06 CMP Yes, just fine. It took us a little longer to lock up that time.

06 03 30 18 CC Yes, a couple of minutes, but it still wasn't bad.

06 03 30 36 CMP And, Karl, on the waste water dump, I overshot 10 percent, just a little bit, but I'm reading - I'm reading about 10 percent now.

06 03 30 48 CC How much was that?

06 03 30 50 CMP I'm reading 10 percent.

06 03 30 56 CC Roger. Reading 10 percent now. I copy that.

TIME SKIP

06 19 14 13 CMP Okay, Houston. Got it.

06 19 14 27 CMP Oh, I've just had a very nice breakfast and getting ready for today's activities.

06 19 15 13 CMP Okay. Stand by.

06 19 17 11 CMP Okay, Karl. Stand by 1.

06 19 17 51 CMP Okay, Karl, go ahead.

06 19 19 35 CMP Roger, Karl. I understand. Yes, the SPS burn is going to be a - a nominal bank B burn - bank B only burn. But to get set up for it, we want to check, after cycle cryo fans, check that the EMS is off, get two EMS circuit breakers in, check that the group 5 circuit breakers are closed, and

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Day 7

check that the SPS pilot valves both are open at that time. And then down where it says, "CB STABILITY CONTROL, panel 8, and SPS 10 or 12," we'll make that a 10.

06 19 20 24 CMP

Okay.

06 19 20 59 CMP

Roger. Understand. You want the SPS PILOT VALVES, MAIN B, closed before DELTA-V THRUST B switch to NORMAL.

TIME SKIP

06 21 09 42 CMP

Okay, Houston, I got 1 minute and 45 seconds to the burn.

06 21 11 02 CMP

Average g.

06 21 11 15 CMP

ULLAGE.

06 21 11 37 CMP

THRUST, on.

06 21 11 51 CMP

THRUST, OFF.

06 21 12 56 CMP

Houston, Endeavour. If you're copying the DSKY, you'll see residuals: .2, .2, and .3; so no trim.

06 21 13 14 CMP

Yes, sir; it certainly does.

CONFIDENTIAL

DAY 8

07 04 14 37 CDR Well, very good. That's nice to know. Thank you much. Save the tapes for us, will you?

07 04 14 53 CDR Save the TV tapes for us, will you, please?

07 04 15 01 CDR Roger. See you around the corner.

07 04 15 20 LMP Okay. That's LOS.

07 04 15 22 CDR Okay.

07 04 15 49 LMP Why don't we have our helmet and gloves on? When we going to dock?

07 04 15 51 CMP Jim, never mind; never mind.

07 04 16 06 CDR Why do we have to have it this way?

07 04 16 09 LMP It'd help to have your glove on - and your helmet on just to keep the Sun out of your eyes, you know.

07 04 16 13 CDR Yes, but we don't have anything in the procedures, do we?

07 04 16 18 LMP Well, I think there's something about doing it optional.

07 04 16 21 CDR Huh! Yes, I think that's ...

07 04 16 42 LMP That sure was a sporty lift-off.

07 04 16 44 CDR I thought it was sort of springy. It looked - it's the soup.

07 04 17 39 LMP And it's tracking good.

07 04 17 42 CDR Our - Okay, turning elliptical.

07 04 17 45 LMP It's coming to 8.

07 04 17 47 CDR State vector's -

07 04 18 16 CDR Okay.

CONFIDENTIAL

07 04 18 17 LMP Now you select ...

07 04 18 19 CDR Okay.

07 04 18 21 LMP Careful.

07 04 19 01 CDR Now we're to ...

07 04 19 05 LMP ... total.

07 04 19 09 CDR ...

07 04 19 17 LMP Okay, AGS - C component is exactly what the ground computed it: 19.1. They came up with - 19.

07 04 19 24 CDR Huh. Well - got a ... computer there.

07 04 19 36 CMP Okay. Four seconds to final comp.

07 04 19 39 CDR Okay, fine.

07 04 19 41 CMP Final comp.

07 04 19 44 CDR Did you get a bunch of good marks?

07 04 19 47 CMP Yes, sir. 19 and 18.

07 04 19 49 CDR Beautiful.

07 04 20 37 CDR Okay, take the end of your first mark and total the answer in minutes. Let me turn that down. Twenty-six minutes.

07 04 20 56 CMP Okay. I've got the answer now.

07 04 20 58 LMP Go ahead, Al.

07 04 20 59 CMP Okay, minus 69.1, minus 6.1, plus 16.1.

07 04 21 07 LMP Copy, minus 69.1, minus 6.1, and plus 16.1.

07 04 21 11 CDR Okay, want to get these numbers, Jim? I mean, tell me the elevation and so on.

07 04 21 25 CDR Okay, here's a NOUN 50 in.

07 04 21 27 LMP ... okay. ...

CONFIDENTIAL

07 04 21 34 CDR Right. There's a ... you better jump. No, no, that's not NOUN 81.

07 04 21 38 LMP ...

07 04 21 39 CDR Here's NOUN 81.

07 04 21 40 CMP Okay, Dave, I'm maneuvering.

07 04 21 41 CDR Okay. Let us give you the numbers first, Al.
Okay - -

07 04 21 44 CMP Go ahead.

07 04 21 45 CDR Okay; 70.3; plus 5.9; and minus 17.7.

07 04 21 55 CMP Okay, that's official burn attitude.

07 04 21 57 CDR That's correct.

07 04 22 02 CMP Okay, ... I'm in attitude and only ...

07 04 22 06 CDR Beautiful.

07 04 22 14 CMP ...

07 04 22 15 CDR Good.

07 04 22 18 LMP Well, I came up with exactly the same numbers as the PGNS, and X and Y, there's a difference of 2 and 3.

07 04 22 27 CDR Okay.

07 04 22 30 LMP I think we'll move. You got the burn attitude?

07 04 22 36 CDR I maneuver now?

07 04 23 11 CDR Okay, Endeavour, did you get our numbers for the burn?

07 04 23 58 CDR Maneuver.

07 04 24 41 LMP Roger. Copy. Okay. It's picking up ... for AGS.

07 04 26 09 CDR We have 3 and a half minutes to go, Al.

CONFIDENTIAL

07 04 26 11 CMP Roger. Understand. ...

07 04 26 16 CDR Excuse me.

07 04 26 17 LMP Yes, Dave. Get your engine.

07 04 26 21 CDR Yes. ...

07 04 26 57 LMP Should be a 3-second burn.

07 04 26 58 CDR Okay, 3-second burn. Don't start until I tell you.

07 04 27 04 LMP Go AGS to maximum to normal. Okay, at 30 seconds, it's ENGINE ARM to ASCENT, manual ullage, and PRO. And AGS to AUTO.

07 04 27 15 CDR I should ... Nothing in it.

07 04 27 38 LMP MARK; 2 minutes.

07 04 27 40 CMP ...

07 04 27 43 LMP And everything looks good.

07 04 28 35 LMP Mark at 1 minute, Dave.

07 04 28 36 CDR Okay -

07 04 28 38 CDR MARK; 1 minute.

07 04 28 40 LMP Okay. AGS going to AUTO now.

07 04 28 43 CDR Okay, AGS to AUTO.

07 04 28 52 CDR Okay. You give me the time. I'll get the ullage.

07 04 28 55 LMP Okay.

07 04 29 06 LMP Okay.

07 04 29 07 CDR Average g low. ABORT STAGE, push. ENGINE ARM to ASCENT. Standing by for 10 seconds.

07 04 29 28 CDR Ullage. Trouble.

07 04 29 39 LMP Three.

CONFIDENTIAL

07 04 29 42 CDR Okay. AUTO SHUTDOWN and AUTO IGNITION. We're trimming.

07 04 29 48 CMP Dave? Did you remember the up-link?

07 04 29 51 CDR Okay. In fact, I think it is.

07 04 29 54 LMP Didn't like it worth a damn. Okay, Dave. We'll be done in a minute with this.

07 04 30 06 CDR Okay, there you go; .2, .2, and .4.

07 04 30 18 LMP I don't like tragedy.

07 04 31 48 CDR Okay, Al. We're starting them over.

07 04 32 29 LMP ...

07 04 33 16 CDR We freaked up at 23: 38 - about 100.

07 04 33 20 LMP I think we're ...

07 04 33 34 CDR We have one mark. Now doing 40.

07 04 33 43 LMP Make that zero burn at this close mode.

07 04 33 45 CDR Never touch it. Really?

07 04 33 46 LMP Yes.

07 04 35 10 LMP Right on the nominal line, Dave.

07 04 35 12 CDR Really?

07 04 35 13 LMP Yes.

07 04 35 24 CDR Hey!

07 04 37 17 LMP Watch it. Tail's going to bump it.

07 04 37 20 CDR Okay.

07 04 37 23 LMP Next thing's - no - no ...

07 04 37 31 CDR Okay. ...

07 04 37 36 LMP You want to grab this?

CONFIDENTIAL

07 04 37 37 CDR We already picked the ...?

07 04 37 39 LMP If he could talk, you could get him.

07 04 37 42 CDR State vector agrees with ... I don't know. I think - Let's see what - We might borrow anything off our equipment.

07 04 37 50 LMP Let's see.

07 04 37 51 CDR Here's your ... pocket.

07 04 37 58 LMP Let's see, what - ... I remember, we've got a ... to do.

07 04 38 21 LMP How you doing over there, Albert?

07 04 38 25 CMP Doing just fine, but it's back to end-to-end, and I've got much in motion.

07 04 38 30 LMP Very good. And reading the procedures and checking - -

07 04 38 32 CDR Oh, yes! Bad update! What do you know. I've been looking for it and I finally saw it, but it's not very funny.

07 04 38 41 LMP Want to check on it?

07 04 38 42 CMP What'd you see?

07 04 38 43 CDR That's your tracking light. You're - -

07 04 38 45 CMP Oh, good.

07 04 38 46 CDR Yes, you're right down the path.

07 04 38 48 CMP Yes, so are you. Your light is right through the money.

07 04 38 51 CDR Is it really? Yours - yours is really dim. About like a - maybe a fourth magnitude star? Okay, let's really hit them.

07 04 39 28 LMP Brighten it up to three.

07 04 39 51 CDR Okay, there she is. Oop!

CONFIDENTIAL

[REDACTED]

07 04 40 03 LMP Especially about this problem. Make it stick.

07 04 41 11 CDR Okay. Know what you got to do, Jim?

07 04 41 14 LMP Yes. I'll take it. I think that's going out there.

07 04 41 19 LMP ... burning.

07 04 41 21 CMP You guys coming up on final comp.

07 04 41 23 CDR Okay. We got 20 seconds or so.

07 04 41 25 CMP Why don't you mark final comp. Get you back with us.

07 04 41 29 CDR All right, I sure will. 10 seconds. 3, 2, 1 -

07 04 41 41 CDR MARK.

07 04 41 44 CMP Gotcha.

07 04 41 45 CDR Okay.

07 04 41 46 CMP Only 3 seconds difference between us.

07 04 41 47 CDR Well, it's a 3-second burn, so that makes sense.

07 04 41 55 LMP No, I don't need it. We have to go to coffee in a minute.

07 04 41 59 CDR Yes.

07 04 42 01 LMP Okay, Al. We've got a minus 1.1, 0, and a minus 1.1.

07 04 42 07 CMP Okay, and I got a plus 1.5, and a minus .2, and plus 1.9.

07 04 42 12 CDR How about that! That's very nice. Think we'll burn our solution on time. That's - it sort of took an ...

07 04 42 20 CMP Okay, go ahead and burn your solution.

07 04 42 22 CDR All right. We'll burn our solution.

07 04 42 27 CMP I'll buy that.

07 04 42 35 LMP Got the AGS and redo solution.

[REDACTED]

CONFIDENTIAL

07 04 42 37 CDR All righty. It's reading straight, now.

07 04 43 42 LMP MARK; 1 minute to the midcourse.

07 04 43 46 CMP Roger.

07 04 44 08 LMP Houston's money?

07 04 44 12 CDR Yes, I guess they're using it.

07 04 44 15 LMP Looking forward.

07 04 44 16 CDR Here, you'll like this.

07 04 44 19 LMP ... I want to plop.

07 04 44 47 CDR There you go.

07 04 44 48 LMP ... and the pink ...

07 04 44 51 CMP Can't you get it all?

07 04 44 54 CDR One more cycle now. Okay, we got it all in.

07 04 44 58 CMP Okay.

07 04 44 59 CDR Consider it down there, Jim. It's really 2222s.

07 04 45 18 CMP Oh, you're shining in the sunlight now! Boy, is that pretty!

07 04 45 27 CDR Who's shining in the sunlight?

07 04 45 31 LMP Us, I think.

07 04 46 15 CMP Yes, I can see in the sunlight now, too.

07 04 46 18 LMP Okay. We've got our first mark. We should be up with you.

07 04 46 22 CMP I believe I can even make out the shape.

07 04 46 25 LMP Hey, that's it!

07 04 46 27 CDR No, sure can't.

07 04 46 30 LMP Hey.

CONFIDENTIAL

[REDACTED]

07 04 46 34 CDR It's unreal.

07 04 46 45 LMP Think you can call another one up?

07 04 46 48 CDR Hmm! You sure if you got the right thing?

07 04 46 52 LMP Seems to be ...

07 04 46 57 CDR Okay. Can't put too much ... Seems to be squared away though, now.

TIME SKIP

07 07 01 09 CC ...

07 07 01 11 CMP Houston, 15. Still in the - the midst of doing a little housecleaning.

07 07 06 37 CC Endeavour, Houston. Would you ask ...

07 07 06 43 CMP Roger, Houston. Hey, Jim.

07 07 06 55 CMP Roger, Ed. I was 1 minute late on that - on the mapping camera. We got it started at 1 - at 174:51.

07 07 07 42 CMP Hey, go to forward OMNI.

07 07 07 45 CDR Okay.

07 07 08 27 CMP Houston, 15.

07 07 08 32 CC ...

07 07 08 33 CMP Roger, Ed. One other thing: I didn't get the P52 in, either.

07 07 08 40 CC Roger. Understand ...

07 07 08 42 CMP Affirm.

07 07 08 49 CC Al, I'll keep track of your cameras for you ...

07 07 08 54 CMP Okay. If you would, that would help.

[REDACTED]

CONFIDENTIAL

07 07 09 15 CC 15, Houston. Give me REACQ and NARROW, please.
07 07 09 18 CMP Okay, REACQ and NARROW.
07 07 10 48 CMP *** the pilot valve - -

TIME SKIP

07 14 07 11 CMP Cabin reading about 5.7 over there, Dave?
07 14 07 22 LMP Okay. I guess we ought to wait until we complete chlorination before we get the - -
07 14 07 33 CMP David.
07 14 07 35 LMP - - the gloves and helmets off.
07 14 07 47 CMP Hello, Houston; this is 15.
07 14 07 50 LMP Baseband.
07 14 07 51 CDR Yes. Of course.
07 14 08 57 LMP Mine.
07 14 09 01 CDR Yes, that's yours.
07 14 09 02 LMP Let me get that.
07 14 11 52 CMP Hey, pretty good.
07 14 12 23 CMP Help me put the other end of this guardrail on here.
07 14 12 27 LMP MDC guard, Al.
07 14 12 30 CMP So the MDC guard.
07 14 12 32 LMP Yes.
07 14 12 33 CDR Hope it doesn't get over ...
07 14 12 37 CMP Is it in the way? Huh?
07 14 12 42 LMP Oh, the MDC guard.

CONFIDENTIAL

07 14 12 43 CDR Did you take that down?

07 14 13 40 CMP Okay.

07 14 33 59 CDR Got it?

07 14 34 00 CMP I got it.

07 14 34 08 CDR Okay, pal.

07 14 34 12 CMP Come here and - get this.

07 14 37 40 LMP What time is it?

07 14 37 54 CMP 32:20.

07 14 38 10 LMP God, 4 hours; that's -

07 14 38 14 CDR ...

07 14 38 16 CMP They say go for it.

07 14 38 19 LMP Yes, just as well. Just fiddling around and getting squared away.

07 14 38 26 CDR That's right. I guess all I'm saying is the Flight Plan really ought to reflect that.

07 14 39 04 CMP Yes, they had you learning the ... switch.

07 14 39 21 CDR Yes.

07 14 39 27 CMP Okay.

07 14 39 51 CDR Right there, Jimmy.

07 14 40 11 CDR Oh, Christ. I'm putting it all over your face here.

07 14 40 28 LMP Want to use some of your soap?

07 14 40 54 CMP Hey, you're supposed to be somehow nonaffected by the CMP.

07 14 42 28 CMP Okay, Dick [sic].

07 14 42 41 LMP Shit.

~~CONFIDENTIAL~~

07 14 43 47 CMP Oh, yes, 7 hours left of my 9-hour rest period.

07 14 44 01 CDR Well, we -

07 14 44 06 LMP Not interested in what he's doing. You'd like that more than this.

07 14 44 18 CMP Huh?

07 14 44 28 CDR Your urine bag? Oh, no, I got them all cleaned out so -

07 14 44 57 LMP Yes. I've cleaned mine.

07 14 45 01 CMP Oh! Poor ... I've been - I tell you, I've been rinsing everything out with water every time I pee and every time I go to sleep.

07 14 45 16 LMP Is that a fact?

~~CONFIDENTIAL~~

DAY 9

08 01 51 13 CMP Houston, 15. Houston, 15.

08 01 51 15 CC Go ahead.

08 01 51 19 CMP Okay, Joe. I got the gyro torquing angles up, and I'll torque them out in a minute.

08 01 51 26 CC Standing by.

08 01 53 17 LMP I'll get out of your way, Al, so you can get down in here.

08 01 53 33 CMP Okay.

08 01 53 38 CC Al, we've no - noted the termination of your fuel cell 3 purge. At your convenience, open the X-ray and the alpha particle experiment covers, please, and turn the alpha particle back on. Over.

08 01 53 51 LMP Okay, Joe, we'll be about another 2 or 3 minutes finishing up all the dumps, and then we'll do that.

08 01 53 59 CC 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.

08 01 54 10 LMP Roger.

08 01 54 17 CDR ... this morning.

08 01 54 19 LMP Yes, Myrtle. I didn't use - I didn't - hadn't used Myrtle this morning. I didn't use Myrtle this morning.

08 01 54 25 CDR I think that checklist is ... 5 minutes and then closed.

08 01 54 29 LMP Yes, it does.

08 01 54 30 CDR Yes, that's ... Yes. Yes. ...

08 01 54 36 LMP Yes. Yes. I didn't use that this morning.

08 01 54 40 CDR ... Al. ...

CONFIDENTIAL

08 01 54 50 LMP That's true.

08 01 54 51 CDR ...

08 01 54 56 LMP Yes. You were smart.

08 01 55 19 CC Good Ship Endeavour, this is Houston. We'll see you on the other side.

08 01 55 23 CMP Okay, Joe.

08 01 55 43 LMP Okay, we got - -

08 01 55 44 CDR We stow this in that jum [?] bag down there? When I took that ..., Al? Okay.

08 01 56 28 LMP How about this? Go MANUAL and WIDE. Right, Al? That what you say? Then - then go to REACQ? Just leave it in MANUAL and WIDE until we come around, right?

08 01 56 41 CMP What?

08 01 56 42 LMP MANUAL and WIDE. How about the SQUELCH ENABLE?

08 01 56 56 LMP I have the SQUELCH ENABLE on.

08 01 59 17 LMP I'll get it. This is ...

08 02 00 04 CMP Okay.

08 02 00 20 LMP Okay, all ... be done behind here.

08 02 01 02 CDR You want to - I don't care. Where is the best place for you to be?

08 02 01 08 CMP Here ...

08 02 01 09 CDR Okay. I'll just stay here in the center.

08 02 01 20 CMP ...

08 02 01 22 CDR I know. You ... put mine on.

08 02 01 25 CMP ... launch.

CONFIDENTIAL

[REDACTED]

08 02 01 27 LMP We might have them sorted out by then.

08 02 01 36 CDR Old Al, he's a gentleman ...

08 02 01 40 LMP No, don't bruise him.

08 02 01 53 LMP Yes?

08 02 02 43 CDR ... read that ... now?

08 02 03 05 CDR ... Magic Marker ... Besides, these used to be the guys ... all versions ... all the cross-subjects of the command module. Although ... all the stuff ...

08 02 03 43 CDR ... a lot of garbage. ...

08 02 03 55 CDR ..., Jim. ... all garbage ...

08 02 04 08 LMP Yes. ... put the garbage in here all ...

08 02 04 46 CDR I don't - -

08 02 04 49 LMP We do? Shoot, I - I feel great today.

08 02 04 56 CDR ... gone from one ... to the two.

08 02 04 59 LMP What do I have to do?

08 02 05 01 CDR Photograph that ...

08 02 05 02 LMP Oh, yes.

08 02 05 12 LMP I should have brought that LEC hook back. It sure was handy in the LM. Trying to grab stuff with the EV gloves was like work.

08 02 05 37 CDR ... 5 minutes ... did you get them - did you get them back ...

08 02 05 49 LMP You know, Dave, we had probably - we had the worst condition possible for getting up and down that front ladders. That's the problem - -

08 02 05 55 CDR ...

08 02 05 56 LMP For getting up and down that front ladders. The gear hadn't stroked at all. And it was, you know, practically off the surface. If I didn't have

[REDACTED]

~~CONFIDENTIAL~~

anything, if I could give a good leap, I could make it to the first rung. Most times, while carrying something, I ended pulling myself up with my arms to get to the first rung.

08 02 06 15 CMP ... the gear didn't stroke ... - -

08 02 06 16 LMP Didn't stroke at all. In fact, the front pad wasn't even on the surface. No, the pad was loose - -

08 02 06 24 CMP Yes.

08 02 06 25 LMP - - free to rotate, so it wasn't even - it wasn't making a firm contact at all with the surface.

08 02 06 36 CDR ... sticking to the bottom, to me. I'll tell you, Jim, it sure is a lot easier than that damn ...

08 02 06 45 LMP Oh, yes, particularly, you know, if there is a little time. I - I could transfer the bags up and just leave them on the porch, wait for you to get up there, and you pass them, then I could grab them with that LEC hook.

08 02 06 55 CDR ... in three times to try it. ... once to transfer the LEC ...

08 02 07 02 LMP Yes.

08 02 07 48 CMP Try your scissors. You ... Your scissors are over there, on your left of your - O₂ FLOW HI. Help me dump it.

08 02 08 07 CDR Oh, shit! ... ketchup ...

08 02 08 13 LMP Here's some, Dave. Right here.

08 02 08 15 CDR Okay. Now ...

08 02 08 36 LMP Want some more?

08 02 08 39 CDR ...

08 02 09 20 CDR ...

08 02 09 42 LMP Cabin pressure's are ...

~~CONFIDENTIAL~~

08 02 09 44 CDR Cabin pressure's are what?

08 02 09 45 LMP Split at 5.

08 02 09 51 CDR What? This vent is open ...

08 02 10 05 CDR Myrtle was ... and the ... valve was just open ...
back up.

08 02 10 50 LMP ... your burn's out if you leave your flow valve
in normal? ...

08 02 11 15 CDR Jim, I think this little valve in your jiminy [?]
bag is all clogged up. That's your problem. Because
I just tried that, and it works fine - transferred
to a new jiminy [?] bag. ... valve.

08 02 11 26 LMP Yes, I think my valve is probably a little clogged.

08 02 11 28 CDR Well, you got to keep it clean.

08 02 11 29 LMP Yes.

08 02 11 59 CDR ...

08 02 12 02 LMP ... I don't think any ... in there.

08 02 12 58 LMP Anyone for chewing gum this morning?

08 02 13 53 LMP Want some chewing gum, Dave?

08 02 13 55 CDR What?

08 02 13 56 LMP Want any chewing gum?

08 02 13 57 CDR ...

08 02 14 37 LMP Do you have all the parts there, Al?

08 02 14 38 CMP They're in here if you need them. ...

08 02 14 47 LMP Good.

08 02 14 56 LMP They go on here ... Take a whole piece.

08 02 15 24 LMP ...

~~CONFIDENTIAL~~

Day 9

08 02 15 39 LMP ... stuff like that.

08 02 15 53 LMP ...

08 02 16 16 LMP Watch it. This washer over here slipped.

08 02 16 33 LMP If you had a screwdriver, I think we could push the washer on this side down a little bit, Al. This washer here's slipped up.

08 02 18 37 LMP Okay. I've got it through now.

08 02 18 40 CMP You've got it a little apart.

08 02 18 44 LMP ...

08 02 18 46 CMP Where is the other part? I got it through the washers. Go ahead. ... be tighter than that.

08 02 18 56 LMP Man!

08 02 19 10 LMP I don't see it. Okay. Tightened it up to some extent ... this screwdriver. Why don't we try them out.

08 02 19 42 LMP Tool E fit in this socket over here? It's too big?

08 02 20 05 LMP Yes?

08 02 20 06 CDR ...

08 02 20 10 LMP Okay, I think we got it. O₂ FLOW HI again.

08 02 20 33 LMP I think you almost got it. You want me to try it ...

08 02 20 50 CMP Better put some chewing gum on it; maybe some tape. That's what we need. Put some tape around it. That will keep it from backing off.

08 02 21 06 LMP Guess we ought to check those screens on the - on the hoses, too; they're probably - should be changed this morning.

08 02 21 23 CDR ... get the vacuum cleaner, pull all the filters out, and we'll ... - -

08 02 21 38 LMP Okay.

~~CONFIDENTIAL~~

08 02 21 39 CDR - - Get the vacuum cleaner ... off, lay down every bag and ... everything before we leave. ... shoes ... stow away ... In the mean time, I'll go around and ... get it ... all the little bags we have and ... all the goodies from the LM, put them in that one camera bag ... bag, and ... And ... check. It would be nice to log all ... before we start taking ... - -

08 02 22 26 LMP Yes.

08 02 22 27 CDR - - Exactly what we're ...

08 02 22 30 LMP Yes, okay. Okay, Dave. If you hand me the tape. I think this is about as tight as we'll get this.

08 02 22 42 CDR I can't hear you.

08 02 22 43 LMP Little pieces of tape.

08 02 22 44 CDR Tape?

08 02 22 45 LMP Yes.

08 02 22 59 CDR How big?

08 02 23 01 LMP Oh, probably - 6 inches worth. Yes.

08 02 23 13 LMP Yes.

08 02 23 27 LMP Dave Scott taught me. Tape everything. Yes, I don't know what we would have done if we hadn't had the tape along. I might have been without comm on the surface.

08 02 23 53 CMP Okay, I think your seat's fixed.

08 02 25 17 LMP You know what we can also do, Dave, is wet wipe the MAGs. Might be even better than - wet wipe them - get a towel - damp towel here - just wipe them off.

08 02 25 27 CDR MAGs?

08 02 25 28 LMP Yes, rather than vacuuming.

08 02 25 29 LMP No vacuum ... wet wipe ... towel ...

CONFIDENTIAL

08 02 25 36 LMP Procedure says to unstow them, vacuum, and then wet wipe. Yes.

08 02 25 41 CDR ...

08 02 25 47 LMP Yes, I was just going ... IM Timeline.

08 02 26 01 CDR I think I would follow the ...

08 02 26 06 LMP Yes.

08 02 26 07 CDR You know why I vacuum ...

08 02 26 11 LMP Okay.

08 02 26 12 CDR ...

08 02 26 16 CMP Can't we use this little square?

08 02 26 17 LMP Yes. Yes.

08 02 26 18 CDR Make sure you ...

08 02 26 20 CMP Use those little square jobbies, you mean - we have around. Yes.

08 02 26 24 CDR And I think vacuuming would be easier to get in the cracks. And I certainly think that dirt will - dirt can get in the cracks ... Maybe wipe the surface clean. ... Okay. ...

08 02 27 31 LMP Yes. Okay.

08 02 27 33 CDR ...

08 02 27 52 LMP You don't have another bag we can put this - this trash in?

08 02 28 02 CDR ...

08 02 28 04 LMP I was wondering if we had another big feed bag that was just about empty - the food locker, we could put this in there. Better than making two transfers.

08 02 28 39 CDR ...

08 02 29 08 LMP ... CG

CONFIDENTIAL

08 02 29 10 CDR ...

08 02 29 21 LMP Well, where's the JETT bag? Let's put it in the JETT bag.

08 02 29 24 CDR We can't use the JETT bag. If we do that you've got to get the ...

08 02 29 32 LMP Okay, okay.

08 02 29 34 CDR Get your own C ...

08 02 29 35 LMP Okay.

08 02 29 58 LMP We don't put up with it.

08 02 30 17 LMP Do you want to take this down with you? Just transfer all the stuff up - out of that bag and into this one here, Al.

08 02 30 22 CMP Yes.

08 02 30 28 CDR ... We got JETT bag in 3 - 310B ... Turn around and look ...

08 02 30 46 CMP ...

08 02 31 12 CDR No, that's ... canister.

08 02 31 25 CDR Hey, I got a mapping camera pad ...

08 02 31 31 LMP Yes.

08 02 31 33 CDR ...?

08 02 31 35 LMP Which one do you want to get in? This one? Okay.

08 02 31 51 LMP I'll just unplug here.

08 02 33 35 CMP ...

08 02 33 37 CDR What?

08 02 33 38 CMP I got the LM Timeline ...

08 02 33 56 LMP Yes, I have.

CONFIDENTIAL

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08 02 33 57 CDR ...

08 02 34 09 CDR Yes.

08 02 34 10 LMP ... cooled things off, too, huh? Beat his ass, too.

08 02 34 15 CDR No, I ...

08 02 34 18 LMP Oh, I don't know.

08 02 34 20 CDR No, I ... something.

08 02 37 21 CDR Daylight. Oh, okay. Sure will. ...

08 02 37 35 CMP ...

08 02 38 41 CDR You know, I figure we got almost exactly a 100 hours. As a matter of fact, this ent - this orbit entry, or - entry interface, is at - 291:30 - huh - 294:43. It is now 194 and some.

08 02 39 25 LMP Not as bad as ...

TIME SKIP

08 03 51 15 LMP Roger.

08 03 51 16 CDR Roger. Let's go back to P00.

08 03 51 19 LMP Mine, too. Is mine in work?

08 03 51 22 CDR No (laughter). I got mine.

08 03 51 26 LMP Yes.

08 03 51 27 CMP ... went that-a-way, huh? Okay. I got tape motion going, so I guess we might as well -

08 03 51 42 LMP We don't need those guys.

08 03 51 50 CDR Oh - beautiful. Fine.

08 03 51 58 CMP ... your private beverage.

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[REDACTED]

08 03 52 11 CMP Okay, Joe. And we're just sitting here in attitude all set to dim the lights and do the gegenschein.

08 03 52 30 CMP (Laughter) Certainly, Joe (laughter).

08 03 52 38 CDR "Anything you need, give us a call."

08 03 52 42 CMP (Laughter) Just like we're assigned right behind ...

08 03 53 02 CMP Better check our camera time here.

08 03 53 08 CDR 153 even is where the Flight Plan calls us.

08 03 53 50 CMP Go ahead.

08 03 53 52 CDR Okay, in 1 minute, Al.

08 03 53 55 CMP Yes. What frame time?

08 03 53 57 LMP One frame, the whole minute.

08 03 54 01 CMP Yes.

08 03 54 04 CDR Ten seconds.

08 03 54 05 CMP One in each hand. ... look all right? Okay?

08 03 54 19 CDR Looks like we're 1 minute and 18 seconds down in the Flight Plan.

08 03 54 23 CMP Bravo. I want to go get a star mark.

08 03 54 27 CDR Okay.

08 03 54 31 CMP Hey. Got coffee?

08 03 54 36 LMP Yes.

08 03 54 38 CMP Yes. ...

08 03 54 40 CDR Okay, Jim, if you'll give us FREE.

08 03 54 53 CMP And turn the lights off down there.

08 03 55 19 CDR Can't get used to it. We're getting free light out there.

[REDACTED]

~~CONFIDENTIAL~~

08 03 56 04 CMP Yes, that's some stuff, ain't it?

08 03 56 06 CDR That's really bright.

08 03 56 22 CMP Now we're trying the gegenschein, the midway point, and the Moulton point. But we got to do an attitude maneuver here in just a minute. In fact, in 3 minutes from now, to be precise, since we're getting a 3-minute exposure.

08 03 56 52 CMP Yes, we're all right for that.

08 03 57 03 CMP Here.

08 03 57 05 CDR That's - that's in some bunch of ... anyway.

08 03 57 17 CDR Well, you see the gegenschein?

08 03 57 21 CMP Well, it should be straight ahead of us, Dave.

08 03 57 30 CDR ...

08 03 57 36 CMP No.

08 03 57 54 CDR Well, I'm not sure. I think we ought to get ... I - I - Why don't you look - I think it would be -

08 03 58 00 CMP No. If there is such a thing, there's a - there's a very definite branch off from the Milky Way. Floating almost to big B. Well, it's not long.

08 03 58 19 CDR No - no, the big hairy one.

08 03 58 28 CMP Yes, that's right. No, it's - it's a localized area, you know. But it would probably be in the shape of an oval. Well, anyway, that's the only thing - that's the only thing that came close to that, was that thing that looked like a branch off the Milky Way. Double or nothing.

08 03 59 34 CMP Okay, turn the lights up there, Jim.

08 03 59 54 CMP No. Okay, go to CMC, AUTO. Okay, now we want to maneuver to another point there: Midpoint attitude, Flight Plan.

08 04 00 05 LMP Midpoint. I understand.

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[REDACTED]

08 04 00 09 CMP Okay, plus .6900.

08 04 00 14 LMP Let's see.

08 04 00 17 CMP 5100? And minus 021.

08 04 00 35 CMP No, 261.

08 04 00 46 CDR Yes. Okay.

08 04 00 48 LMP ...

08 04 00 54 CMP It's - it's in the ...

08 04 00 56 LMP Oh, Jesus!

08 04 00 58 CMP ...

08 04 01 10 LMP Shouldn't laugh at me.

08 04 01 18 CMP Give him my regards.

08 04 01 21 CDR Now break down a little bit. Look, he'll stay crazy if you're acting crazy. Look, Al, he doesn't understand.

08 04 01 29 CMP We're down in the time line. Getting slightly green, Jimmy, my boy?

08 04 01 34 LMP No.

08 04 02 00 CDR I got to get it into AUTO.

08 04 02 08 CMP ... getting ...?

08 04 02 12 LMP Christ!

08 04 02 17 CMP Yes, I know.

08 04 03 08 CDR Now let the rate damp there for a second; hope it improves.

08 04 03 48 CDR Okay, you're not losing face.

08 04 03 52 CMP Yes. Right. Okay.

08 04 04 19 CMP As I was saying -

[REDACTED]

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08 04 04 22 LMP Ah, go to hell, MDC.

08 04 04 24 CMP What's that time on the other one? Time on the DSKY?

08 04 04 45 LMP ...

08 04 05 37 CMP Mm-hmm. Yes, I used them, too.

08 04 05 51 CMP What elevation? Yes.

08 04 06 32 CMP Yes, there's quite a few stars out there, aren't there?

08 04 06 35 LMP Christ! ... given you?

08 04 06 38 CMP A little darker now. Let's see. There's my star right up over there. Yes, that's -

08 04 06 49 LMP ...

08 04 07 02 CDR ...

08 04 07 38 CDR Damn! You always seem to take it bad when you do an alinement.

08 04 07 45 CMP Well, you can't be all crude and all. But that little - that - that little - that thing there is something. Might be another planet.

08 04 07 54 CDR Why don't you ...?

08 04 07 56 CMP Yes. Yes.

08 04 08 18 CDR ...

08 04 08 28 CMP Yes.

08 04 08 47 LMP ...

08 04 08 54 CMP Yes, trying to move ... We've got another 5 minutes to go. Anyway, we've used -

08 04 09 02 CDR Okay. Okay, Jim, lights up.

08 04 09 14 CMP And we got a P20 coming then.

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08 04 09 19 CDR Yes, CMC, AUTO. And this time we want maneuver to -

08 04 09 38 CMP Yes. We have ...

08 04 09 46 CDR We haven't ...

08 04 09 54 LMP ...

08 04 09 57 CMP Well, got the housekeeping done.

08 04 10 02 CDR We're not going to have a ...

08 04 10 09 LMP That's a shame. ...

08 04 10 25 CMP I can't find - -

08 04 10 26 CDR Turn the lights down and look for a few minutes, if you want.

08 04 10 29 CMP We don't have to stop for another 10 minutes yet.

08 04 10 33 CDR So you can go to ATTITUDE HOLD there, Jim.

08 04 10 36 CMP Or go to CMC, AUTO.

08 04 10 48 CMP Got it. Turn it down. Turn that damn thing down.

08 04 11 37 CMP ...

08 04 11 39 LMP I want to look for a few minutes.

08 04 11 56 LMP God damn. Is it in there?

08 04 11 59 CMP You can see something bright down in there.

08 04 12 27 LMP Al, could you move it?

08 04 12 29 CMP No, it's ...

08 04 12 50 CMP Yes.

08 04 12 59 CDR ...

08 04 13 05 LMP No, can't see. I just can't see. ... lights wouldn't come down. It's a function of lighting.

08 04 13 22 CMP No. ... got ... something else.

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08 04 13 26 LMP No, I really can't see anything, Dave. ...

08 04 13 28 CMP Oh, shit. You're too easily impressed.

08 04 13 33 LMP No one thinks like me.

08 04 13 35 CMP Yes. As a matter of fact, that's what I keep saying.

08 04 13 44 LMP Freak you.

08 04 13 45 CMP That's not nice.

08 04 13 48 CDR See if I can see that.

08 04 14 01 CDR Oh, let me see. That's - that's too hard to see.

08 04 14 09 CMP Okay.

08 04 14 15 LMP ...

08 04 14 17 CDR They're not - they're not as bright as I thought they'd be, either.

08 04 14 20 CMP They're not?

08 04 14 21 LMP Is that right?

08 04 14 22 CDR Yes. They're not - they're not much brighter than they are on Earth. Okay, lights up. Camera's off?

08 04 14 42 CMP No, the guy wants that - business here. Yes.

08 04 15 50 CMP Okay, Dave, will you put these back in B-2 for me, please?

08 04 16 30 CDR Jim? Is that breaker off?

08 04 16 59 CDR Yes, might as well call.

08 04 17 01 CMP All right. I want to move these before I - ... Ow!

08 04 17 09 CDR All right.

08 04 17 11 CMP Too early.

08 04 17 28 LMP ...

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[REDACTED]

08 04 17 45 CMP ...

08 04 20 33 CMP Yes.

08 04 20 45 CMP Huh? Yes. Yes, I'm a person. Right here, Jim.

08 04 20 51 CDR ...

08 04 20 52 CMP Well, put the TV back in -

08 04 20 56 CDR If you will, snap that one.

08 04 20 58 CMP It kind of gets in the way of everything else. Let me stick it down here for now.

08 04 21 08 LMP Sure is fun with lots of people.

08 04 21 12 CMP Stow them.

08 04 21 54 CDR Put that one down here with mine.

08 04 22 11 CDR What's that, Jim?

08 04 22 13 LMP No!

08 04 22 14 CMP Good. Very good.

08 04 22 17 CDR Okay?

08 04 22 18 CMP Yes. You got to - yes. We've already signed those, haven't we? We haven't signed these? It really doesn't make much difference, does it?

08 04 22 26 CDR No.

08 04 22 27 CMP We don't really have to sign them now I guess. We can do that anytime.

08 04 23 10 CMP Yes, those - those covers would have been infinitely more valuable, I think.

08 04 23 17 CDR Oh, well.

08 04 23 21 CMP Maybe, Dave, it's just as well we didn't.

08 04 23 27 LMP Okay.

[REDACTED]

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08 04 23 30 CMP Bastard.

08 04 23 35 CDR ...

08 04 24 49 CDR I've got one. Come down.

08 04 24 51 CMP God damn. Is it - is it in there?

08 04 24 56 CDR Oh, I've only been changing the film; one in the LM and one in there. Come on down.

08 04 25 02 CMP I'm going to have to go all the way back to the Moon to come on some of that.

08 04 25 06 CDR (Laughter)

08 04 26 13 CDR ...

08 04 26 21 CMP Yes, very good. ... that move.

08 04 26 30 CDR ...?

08 04 26 31 CMP Yes.

08 04 26 32 CDR What? No more film.

08 04 26 36 CMP What?

08 04 26 37 CDR ... I need more film ... camera ...

08 04 26 39 CMP Can you change it?

08 04 26 42 CDR ...

08 04 26 45 CMP Yes, but you know the way he is.

08 04 26 49 LMP Feel around here.

08 04 26 50 CMP Yes, sir.

08 04 26 57 CDR ...

08 04 27 04 CMP Oh, no. But I don't think you are. ...

08 04 27 10 LMP That's the reason. Yes, yes, yes.

08 04 27 20 CDR ...

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08 04 27 22 CMP That doesn't take very long.

08 04 27 26 LMP Where you going?

08 04 27 30 CMP This guy's got more pens somewhere, because I need one to keep track of the Flight Plan, too.

08 04 27 35 LMP Here's one.

08 04 27 54 CDR ..., Al.

08 04 27 55 CMP I got one.

08 04 28 25 CMP Excuse me, Jim.

08 04 28 28 LMP Excuse me.

08 04 29 33 LMP Sure can.

08 04 29 57 CDR ...

08 04 29 59 CMP Yes. I got one. Yes.

08 04 30 01 LMP ... solution in color ...

08 04 30 19 LMP You got a MAG that hasn't been used at all?

08 04 30 32 CDR ...

08 04 30 37 CMP Huh? Just as - it may be just as well. Tell me we don't have any.

08 04 30 43 CDR We don't - we don't have any of that left.

08 04 32 10 CMP Hey, gang, they don't have another eat period for 6 hours.

08 04 32 12 CDR What?

08 04 32 13 CMP There's not another eat period in the Flight Plan for 6 hours.

08 04 32 16 CDR Six more hours? Jesus Christ!

08 04 32 21 CMP That's right. And that's just before our sleepy time.

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08 04 32 28 CDR Six hours to bed.

08 04 32 43 CDR Yes. I don't think we need the Contingency anymore. We don't need that one. Or these. Or these.

08 04 33 21 CDR Can I get that map you got over there?

08 04 33 24 CMP Okay. Yes, got -

08 04 33 29 CDR Two of them here. Have three.

08 04 33 41 CMP Okay, David.

08 04 33 42 CDR Most of these don't.

08 04 33 45 CMP Yes. Got two fresh maps here. One's labeled CMP and the other is labeled nothing.

08 04 34 36 CMP Well, we missed some spectacular terminator photos. Damn. You know, I was wondering. You want to get the terminator photos if still possible. That would have really been spectacular.

08 04 34 54 CDR ...

08 04 34 55 CMP Well, yes. The terminator's on the Flight Plan.

08 04 35 00 CDR Yes.

08 04 35 56 CMP Well, if we've got the film, by golly, I'd like to take a lot of terminator photos.

08 04 36 09 CDR Yes.

08 04 36 10 CMP No, that'd really be neat; take a bunch of terminators. And the setting should be the same regardless of where the terminator went.

08 04 36 18 CDR ...

08 04 36 21 CMP Yes.

08 04 36 22 CDR ...

08 04 36 23 CMP Boy. That one's - Look at that.

08 04 36 29 CDR ...

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08 04 36 44 CMP Do you know how to change the settings from 250 to 500?

08 04 36 49 CDR ...

08 04 36 57 CMP No, I mean - I mean what the comparable settings are. Like f/5, 1/50th and all that.

08 04 37 04 CDR ...

08 04 37 05 CMP Yes.

08 04 37 07 CDR ...

08 04 37 09 CMP Terminator photos for the 250, they call out f/5.6 and 1/125th. And that's for the very-high-speed black and white. Yes. You don't have any left though, do you? No. Yes.

08 04 37 31 CDR ...

08 04 37 35 CMP No. No, that's not fast enough. That's all right. Listen, I got lots of brand R left. Use it.

08 04 37 59 CDR ... something.

08 04 38 02 CMP Yes.

08 04 38 16 CMP Yes. It sure would be nice to get a - some pictures down into the bottom of ... bottom. ...

08 04 40 25 CMP Oh, deary.

08 04 40 34 CDR The old Earth is real impressing down there. ... get some.

08 04 41 16 CDR ...

08 04 41 19 CMP Oh, boy! God, I guess. That thing was huge.

08 04 41 25 LMP ...

08 04 41 27 CMP Never did, huh?

08 04 41 41 CDR ... Never mind.

TIME SKIP

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08 05 47 23 CDR Well, we ought to be able to tell in an hour.

08 05 47 24 LMP Okay.

08 05 47 30 CDR The what? Oh, yes. Okay?

08 05 47 55 LMP ...

08 05 47 57 CDR We are, Jim. I got it hot for you. Don't worry, pal, we won't forget you.

08 05 48 05 LMP I'll bet you ...

08 05 48 09 CDR No. I think he's right here.

08 05 48 12 LMP ... sex?

08 05 48 15 CDR Neuter? Okay, that spaghetti is mine. Hamburger wet pack. Pea soup, ham and salad, applesauce, cheese crackers. Brack!

08 05 48 32 CDR Blach! Does it look like it, Jim?

08 05 48 34 LMP Yes.

08 05 48 36 CDR You say it looks like it, Jim?

08 05 48 39 LMP No.

08 05 48 45 CMP You got eyes, they're almost 20 - 20, so - (laughter) Okay, it's a - -

08 05 48 53 CDR I think it's time to raid you. I want to make sure they get it all down - down on the - on the file there.

08 05 50 26 CDR Very good.

08 05 50 28 LMP What?

08 05 50 30 CDR That one's for you. Here. Have at it. ... turn around ...

08 05 50 53 CMP ... here.

08 05 52 04 CDR ...

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08 05 52 09 LMP Well, I think I'd - stick it under the couch there. That's where I kept it before. But, of course - Huh?

08 05 52 17 CDR ...

08 05 52 19 CMP (Laughter)

08 05 52 21 CDR ...

08 05 52 22 LMP May be, David. The empty ones, you mean. Oh, that's what you're talking about. Empty one. Yes. Yes. A-2.

08 05 52 37 CDR Okay, Jimmy, you got 8 minutes to go.

08 05 52 59 LMP ...

08 05 53 01 CDR Hey, listen. You - you - you're bugging me a little bit. If you're going - if you're going to exercise, you ought to at least have the decency to put your biomed on (laughter). There's no sense wasting all that on us. Let the doc see it.

08 05 53 23 CDR Ooh, applesauce. Their applesauce is good stuff.

08 05 54 05 LMP You have Cannon towels, no doubt.

08 05 54 06 CMP Yes.

08 05 54 07 CDR I think I've been holding this many of them before.

08 05 55 31 CDR Oh, yes. Yes, we were in darkness about the time ... We'll be on the dark side for about 20 minutes now.

08 05 58 06 CDR Two minutes to go, Jim.

08 06 00 42 CMP Hey, Jim.

08 06 00 46 CDR Okay, Jim.

08 06 01 24 CMP ... regular ... heartbeat.

08 06 01 34 CDR Huh? Yes. After - after awhile it gets to be working, moving your legs around again, you know?

08 06 01 45 LMP ...

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08 06 01 53 CDR ... boy, oh boy.

08 06 02 38 CDR How do you mean?

08 06 02 48 CMP No?

08 06 02 53 CDR Oh, my eyes - my eyes were playing funny tricks on me for a while. ...?

08 06 02 58 CMP So am I. Yes.

08 06 03 01 CDR I'll think I'll see a - yes. Yes.

08 06 03 09 LMP Oh, yes, I seem to be getting them.

08 06 03 17 CDR Well, that's like a ...

08 06 03 19 LMP Too early.

08 06 03 22 CDR No. My brain is seeing them when you're not.

08 06 03 35 CMP Hey, Dave, you any good at putting hot water in?

08 06 03 38 CDR Oh, God, yes. Let's - Okay.

08 06 03 42 CMP How about doing some pea soup for me when you get around to it?

08 06 03 45 CDR Huh? Where's your spoon, Jimmy?

08 06 03 56 CMP Is it in here?

08 06 04 12 CMP ... Jimmy's spoon.

08 06 04 19 LMP It's in the - oh, okay. ...

08 06 04 32 CMP You mean like these?

08 06 04 45 CMP What spoon?

08 06 04 49 CDR How many?

08 06 04 59 CMP Oh! Gee, what'd I do? Try to get rid of them?

08 06 05 46 CDR What?

08 06 05 55 LMP You're getting ... for a ...

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08 06 05 57 CMP Yes.

08 06 06 02 CDR ...

08 06 06 35 CDR ... (Clears throat)

08 06 06 46 CMP Yes.

08 06 06 50 LMP ...

08 06 06 53 CMP Watch it. He'll be bitching about that.

08 06 07 42 LMP ...

08 06 07 45 CMP Yes.

08 06 07 50 LMP Give it to Al.

08 06 07 57 CMP Give me the little white tool.

08 06 08 17 CMP Thank you, Dave.

08 06 09 15 CMP ... got in the way here.

08 06 09 18 LMP ...

08 06 09 21 CMP Yes. It really is. Yes. I wish you guys would go somewhere.

08 06 09 45 LMP ...

08 06 09 47 CMP Because he doesn't want the gray to show.

08 06 09 50 LMP ...

08 06 09 51 CMP (Laughter) He'd be perfectly happy if we had pens instead of erasers.

08 06 10 15 CMP (Laughter)

08 06 10 49 LMP ...

08 06 11 22 CDR Hey, how about exporting it?

08 06 11 34 CDR ... Yes. ...

08 06 12 20 CMP ...

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08 06 12 43 CDR You guys ...?

08 06 13 15 LMP ...

08 06 20 30 CDR ...

08 06 20 35 CMP ..., Dave.

08 06 20 37 CDR Where? I don't see ... Huh?

08 06 20 44 CMP Right there.

08 06 20 46 CDR ...

08 06 21 07 CDR Yes. I can see ...

08 06 21 10 CMP (Laughter)

08 06 33 34 CDR Don't forget, we got ...

08 06 33 37 CMP Yes.

08 06 35 50 LMP What a sport.

08 06 36 06 LMP What a sport!

08 06 36 08 CMP ...

08 06 36 09 LMP You are.

08 06 36 11 CMP (Laughter) Yes. Yes.

08 06 36 29 LMP Enough!

08 06 36 32 CMP Yes.

08 06 36 33 CDR Enough's enough. ...

08 06 36 39 LMP Yes.

08 06 36 41 CDR ... - -

TIME SKIP

08 09 46 10 CDR Boy, that's ...

~~CONFIDENTIAL~~

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08 09 46 13 CMP We didn't put it in my safe place.

08 09 46 18 CDR Are you at P51?

08 09 46 20 CMP I'm not there yet. See, I cleaned that thing religiously, all - every night?

08 09 46 28 LMP No - -

08 09 46 29 CDR But we didn't - -

08 09 46 30 LMP ...

08 09 46 31 CMP But - but we didn't get it last night, I don't think.

08 09 46 32 CDR No, it's all that crap we brought in here.

08 09 46 34 LMP Yes. Yes. Yes. Feel the difference already in air that's blowing out of the hose. It really does make a difference. Yes.

08 09 46 47 CDR I thought it was practically suffocating.

08 09 46 51 CMP Probably that, and the combination of going in dark.

08 09 46 58 CDR Oh, gosh. They're sitting there in their own comfortable console.

08 09 47 02 LMP ...

08 09 47 03 CDR ...

08 09 47 04 CMP Yes, that's right. Go ahead.

08 09 47 21 CMP All righty. Thank you, sir, and we'll see if we can conjure one up for you.

08 09 50 50 CMP ...? Yes, I need to get him a status of the command module. Joe - we'll give it to him when we come around next time.

08 09 51 38 CDR That's the stuff ...

08 09 52 35 CMP You tell me when - You tell me when ... that flight data ...

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08 09 54 28 CMP What's you doing? What's you doing? Throwing away dirty stuff? ...

08 09 54 40 LMP ...

08 09 54 44 CMP ... - You didn't put on clean tonight, did you?

08 09 54 46 LMP ...

08 09 54 47 CMP Oh. Your last one? Guess you got stuck with it, Jim. ...

08 09 55 26 CMP (Laughter) I've got a little job for you to do, Jim. Assemble camera, lens, mirror, and magazine on special window-5 bracket; rotate the lens 180, so we can take pictures of the mass spec. You do that in - about 15, 20 minutes. Well, we use the - we use the 16 millimeter. And the bracket's down in A-8. You know, that big bracket down there. You do that while I'm - -

08 09 56 09 LMP I don't see it.

08 09 56 10 CMP - - while I'm doing a P52. Oops! Excuse me, Dave. ...

08 09 56 18 CDR ...

08 09 56 21 CMP Yes, I know. God dang, it's not very crowded down here!

08 09 56 39 CDR Hey, you got to this ...

08 09 56 40 CMP Okay. We'll - we'll get it. I'll get it. Keep going. I'll get it.

08 09 56 44 CDR ...

08 09 56 47 CMP I used to do it by myself. No big deal.

08 09 57 08 CMP Okay, as long as you're in the couch, how about putting me in FREE? MODE to FREE.

08 09 57 14 CDR Okay.

08 09 57 36 CMP Star 1.

08 09 58 56 CMP Star 40.

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08 09 58 57 LMP Where?

08 09 58 59 CMP Out there.

08 09 59 47 CDR Woo!

08 09 59 52 CMP ...

08 10 00 04 LMP ...

08 10 00 06 CMP Huh?

08 10 00 07 LMP ...

08 10 00 09 CMP Let's see. ... 202:00:30.

08 10 00 43 CMP Jim wants to know if his camera ... on the mass spec stuff.

08 10 00 59 CMP Jim, you want to get the - the mass spec boom and gamma ray boom on their way out now? Might as well go ahead and do that.

08 10 01 08 LMP MASS SPEC BOOM, DEPLOY. ... find it?

08 10 01 11 CMP No, just get it out.

08 10 01 13 LMP Do you want to - -

08 10 01 14 CMP We got time for it.

08 10 01 15 LMP - - ...

08 10 01 16 CMP Yes. Okay, mass spec boom photography, 16 millimeter - MAG L. What MAG's on there? E is on there now?

08 10 01 37 LMP ...

08 10 01 57 CMP Here, you've got to put this UV thing in the window, too.

08 10 02 02 LMP I'll have to go back.

08 10 02 36 LMP Okay. I took all this - extra film and ...

08 10 02 38 CDR ... You got plenty of places in here, right?

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08 10 02 43 CMP Yes.

08 10 02 47 CDR ... remember ...

08 10 02 52 CMP Okay.

08 10 02 53 CDR You'll never get it all used up if you ...

08 10 02 55 CMP That's right. We'll never have time to use it all.

08 10 03 04 CDR ...

08 10 03 20 CMP Yes. Is there any further use for the vacuum cleaner and all this - -

08 10 03 25 LMP ... -

08 10 03 26 CMP - - stuff hanging around here?

08 10 03 28 LMP ... Put the bag and brush in ...

08 10 03 39 CMP Okay.

08 10 03 47 LMP ...

08 10 03 48 CMP Yes.

08 10 03 53 CDR ...

08 10 04 13 CDR You've got to use it for ...

08 10 05 07 CDR What have you got in there now?

08 10 05 11 CMP Where did you - -

08 10 05 12 CDR ...

08 10 05 13 CMP - - where'd you leave the filter and all that stuff?

08 10 05 16 LMP ...

08 10 05 17 CMP Okay. Might as well leave it all there, huh?

08 10 06 19 CMP I think before activities get too far away, I will take a crap.

08 10 06 24 CDR Is that so?

CONFIDENTIAL

08 10 06 25 CMP Yes. Jim, will you unplug me, please? You guys got the comm.

08 10 06 29 LMP ...?

08 10 06 30 CMP Yes.

TIME SKIP

08 19 49 57 LMP Trade you for your cocoa.

08 19 50 17 CDR 35, 45.

08 19 51 23 CDR Okay. Okay?

08 19 51 33 CDR ... Right? ... 3.

08 19 51 51 LMP Here you go, Al. There. Okay. Good.

08 19 52 23 LMP Here's your bag, Al. Give me your juice, then, Al. I'll take the juice.

08 19 52 58 CDR I think I'll ... Okay. ... eggs ...

08 19 53 20 LMP We have sausage and eggs. How about sausage this morning.

08 19 53 24 CDR ...

08 19 53 25 LMP Sausage this morning.

08 19 53 27 CDR Scrambled eggs and sausage? That'd be good.

08 19 53 29 LMP That'd be good. Yes.

08 19 53 48 CDR ...

08 19 54 14 LMP Our favorite compartment.

08 19 54 43 CDR ... sleep, Jim?

08 19 54 45 LMP Pretty good. I just woke up once.

08 19 55 54 SC (Humming)

~~CONFIDENTIAL~~

08 19 56 18 CDR ... down there. ...

08 19 57 03 LMP Want me to try to put that separator on the - dispenser down here, Dave?

08 19 57 09 CDR Well, we haven't got any ...

08 19 57 21 LMP That's probably why we're farting so much.

08 19 57 23 CDR What'd you say?

08 19 57 24 LMP Probably why we're farting so much up here.

08 19 57 27 CDR Yes, I didn't put - -

08 19 57 28 LMP All smells like hydrogen, really.

08 19 57 30 CDR - - ...

08 19 57 31 LMP Check it here.

08 19 57 32 CDR ... What's that number.

08 19 58 58 LMP Okay, Dave. Here's that other cocoa.

08 19 59 10 CDR ...

08 19 59 12 LMP Too late now. Don't be an Indian giver.

08 20 01 08 LMP If you have something there to go in the hot water, Dave, I'll stick them on for you.

08 20 01 15 CDR Yes, I got ...

08 20 01 26 LMP What do you want, Dave?

08 20 01 28 CDR Oh, that's all right. What do you have?

08 20 01 32 LMP Okay, I'll see what I can dig up out here.

08 20 01 34 CDR ...

08 20 01 35 LMP No - -

08 20 01 36 CDR ...

08 20 01 38 LMP Be easier since I'm here.

~~CONFIDENTIAL~~

08 20 02 32 LMP Can you bring this back a little, Al? Will that go back?

08 20 02 50 LMP Yes.

02 20 03 40 LMP Anybody want any fruit? Lot of apricots and peaches.

08 20 04 02 CDR ..., Jim?

08 20 04 03 LMP Yes.

08 20 04 38 LMP How about some bacon squares?

08 20 05 02 CDR ...?

08 20 05 05 LMP Coffee.

08 20 05 21 LMP Yes. Stick it on there. Did you tighten down on it?

08 20 05 31 CDR ...

08 20 05 36 LMP Is it tightened down?

08 20 05 37 CDR Turn around.

08 20 06 20 CDR ...

08 20 07 59 CDR ... Jim ...

08 20 08 10 CDR Very simple.

08 20 09 11 LMP Ready? You really have to push it on there.

08 20 09 14 CDR ...

08 20 09 15 LMP Is it up all the way? Yes - you - you have to push pretty hard to get it on there.

08 20 09 27 CDR Think it ...

08 20 09 30 CMP I don't know ...

08 20 10 42 CDR I don't know. Something coming out of there?

08 20 10 47 LMP Yes, it's coming out there, but - looks like there's a lot of water collecting at the end of the separator. No, I just - it's got a pool there at the end.

~~CONFIDENTIAL~~

Day 9

08 20 10 58 CDR ...

08 20 11 12 LMP In fact, it looks like it's leaking. It is leaking. It's leaking, Dave.

08 20 11 23 CDR I guess it's just ... water ...

08 20 12 43 CDR ...

08 20 12 50 LMP Went to bed at 9. Got up at 4.

08 20 12 55 CDR Got up at 4!

08 20 13 03 LMP Seven hours.

08 20 14 14 CDR ...

08 20 14 54 CDR What?

08 20 16 54 CDR ...

08 20 17 02 LMP When are we going to listen to music? Were you listening to - your recor - the recorder last night, Dave?

08 20 17 12 CDR Say what?

08 20 17 13 LMP Were you listening to your recorder last night?

08 20 17 15 CDR ...

08 20 17 17 LMP Did - didn't you have some music on last night? I'd swear I heard music just before I went to sleep.

08 20 17 24 CDR ...

08 20 17 26 LMP Put me to sleep anyway.

08 20 17 32 CDR ...

08 20 17 34 LMP (Laughter)

08 20 17 45 CDR ...

08 20 19 25 CDR ...

08 20 20 48 LMP Want me to put some hot water in those eggs, Dave?

~~CONFIDENTIAL~~

08 20 21 13 CDR ...

08 20 21 15 LMP About ready to go again.

08 20 21 31 CDR ...

08 20 21 32 LMP Yes.

08 20 22 21 CDR ...

08 20 22 23 LMP Yes.

08 20 22 24 CDR ...

08 20 22 26 LMP Yes.

08 20 22 27 CDR ...

08 20 22 40 LMP Okay.

08 20 22 57 LMP Want some more?

08 20 22 58 CDR Yes. Sure. ...

08 20 28 05 CC Apollo 15, this is Houston. How do you read?

08 20 28 11 CDR Hi, Houston; 15. Loud and clear. How - us?

08 20 28 17 CC Hi, Dave. You're coming through loud and clear. How did our consumables update get to you? Okay?

08 20 28 25 CDR Yes, we got normal ... Okay. We got everything but the oxygen.

08 20 28 34 CC Okay. Want me to read those three up?

08 20 28 43 CDR Okay. Go ahead.

08 20 28 51 CC Roger. Oxygen tanks at that same time that I gave you originally were 61, 64, 48.

08 20 29 09 CDR Okay. 61, 64, and 48. And I have a P52 for you and a crew status report.

08 20 29 20 CC Fire away with them.

~~CONFIDENTIAL~~

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Day 9

08 20 29 23 CDR Okay. The P52: NOUN 05 was .01; NOUN 93 was plus .029, minus .025, plus .018; it was torqued out at 211:52:00.

08 20 29 48 CC Roger.

08 20 29 52 CDR And if you still have your pencil handy, why, the sleep came out to 7, 7 and a quarter, and 7. And the PRDs: 25026, 23182, and 08033. And go ahead with your updates.

08 20 30 18 CC 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 the following revs, there are very few updates. Okay. At 212:40, we want to delete MAP CAMERA IMAGE MOTION, INCREASE.

08 20 30 53 CDR Roger. Got the deletion at 212:40. Go.

08 20 30 55 CC At 2 - Roger. At 213 plus 24, we want to delete the GAMMA RAY BOOM, DEPLOY.

08 20 31 08 CDR Marking DEPLOY.

08 20 31 10 CC And at that - there are three - Roger. And just below that, the MSFN verify len - lens tuck in and also the PAN CAMERA POWER, OFF; delete both of those.

08 20 31 23 CDR Roger. Copy the next two deletions also. Go.

08 20 31 30 CC At 214 plus 02. We want to change that camera configuration to the 250-millimeter lens, 250. The f-stop should be 5.6; the exposure time should be 1 over 125.

08 20 31 57 CDR Roger. 214:02. Camera configuration: 250 millimeter lens, f/5.6 ...

08 20 32 07 CC Correct. - -

TIME SKIP

08 23 35 22 LMP ...

~~CONFIDENTIAL~~

08 23 35 27 CMP What?

08 23 35 28 LMP ...

08 23 35 30 CMP Yes, he'll ... Follow those numbers. As long as we're in FREE, it don't really make any difference whether you got P30 running or not, as far as P20 is concerned. Anyway, they don't care about it as long as we don't run it more than a half an hour.

08 23 36 43 CMP No, he wanted to run the P20 through.

08 23 36 46 CDR ...

08 23 36 49 CMP Yes.

08 23 36 50 SC ...

08 23 36 51 CMP You want to do a P20 first.

08 23 36 52 SC ...

08 23 36 54 CMP Yes, you don't need to do that until - They - they need to have us inertial for a while. Yes. We do that calibration in this attitude. And then at -

08 23 37 07 LMP ...?

08 23 37 08 CMP Yes. At 55, then we can go ahead and do a P20, and - and get into attitude and then do the P30.

08 23 37 22 LMP (Yawn) ... time for ...?

08 23 37 27 CMP Hey; you know, it is. What time is that thing happening? Not for a while yet, I bet.

08 23 37 45 CMP ... another 3 and a half hours.

08 23 40 27 CMP Yes, ...

08 23 40 33 LMP ... What ... do? Let's see ... We're ... that bag ... Put them away - ...

08 23 40 57 CDR Stand by and ... Come on. ... LOGIC ...

08 23 41 02 LMP 8700? The rest of them ...

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08 23 41 08 CDR ... still too ...

08 23 41 11 LMP Yes, I know.

08 23 41 13 CDR Got to ... these goddam ...

08 23 41 18 LMP ...

08 23 41 22 CDR ... this ...?

08 23 41 23 LMP ...

08 23 41 28 CMP Yes, it's not much of a lineup - from a ...

08 23 41 38 CDR ...

08 23 41 41 LMP ... What are you trying to do? ...

08 23 41 53 CDR Well, if you want to get - well, what I really want to do is make sure we got helmets and gloves ... Be right back.

08 23 42 00 LMP Where you going?

08 23 42 01 CDR I got to put your - I got to put my helmet ... my EV gloves. The rest of your helmet, Jim, will go with my helmet and your ...

08 23 42 21 LMP Yes, put them down there. ...

08 23 42 32 CDR ... out?

08 23 42 33 LMP ... umbilical and ...

08 23 42 44 CDR ... going to do it just like you used to do it with a checklist back when ...

08 23 42 49 CMP Try to find that checklist ... It's part of the requirement. ... do. You're going to have to punch all these goddam switches, pardner.

08 23 42 59 LMP ... for the ... switches, let me know.

08 23 43 16 CMP Who doesn't?

08 23 43 19 CDR ...

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08 23 43 28 LMP Just have to see.

08 23 44 00 CDR We'll have to stow this stuff for TEI. ... umbilical. All this stuff for the EVA configuration, ... really ... trouble.

08 23 44 20 CDR ... - -

08 23 44 21 CMP Well, we are going to have to photograph the EVA, too. (Cleared throat)

08 23 44 27 CDR I know that.

08 23 44 29 CMP Okay.

08 23 44 30 LMP ..., too. ...

08 23 44 34 CDR Yes.

08 23 44 42 CMP We better not use - use your attitude. ... The rates are low. ... I think once we get ...; otherwise, maybe we could arrange a TEI ... (Laughter)

08 23 44 57 LMP Yes.

08 23 44 58 CMP Well, TEI, all we really need to do is ...

08 23 45 05 CDR Sounds like you're trying to get out of EVA ... Tomorrow, ... take a little - -

08 23 45 10 CMP Yes.

08 23 45 11 CDR - - reshuffling. So, if you can go now, ... some reasonable point ... EVA prep. We can try it, anyhow; because tomorrow, when I'm trying to get things squared away for the EVA prep, by the time we can ... the EVA prepping ... It'll be late tomorrow before we even ...

08 23 46 04 LMP Yes. We can get all that stuff done ...

08 23 46 08 CDR Yes.

08 23 46 13 CMP Got lots of stuff to be ...

08 23 46 15 LMP ... for these? Oh! ...

~~CONFIDENTIAL~~

08 23 46 23 CDR ... Yes. Well, we can't really use those on this EVA. ...

08 23 46 30 LMP Yes.

08 23 46 34 CMP Watch it now. ... coming up ...

08 23 46 40 CDR ... Where will we have to go with - Well, let's put it in this ...

08 23 46 48 CMP It's getting ...

08 23 47 02 CDR ...

08 23 47 04 LMP What?

08 23 47 05 CDR I said, "Why don't we ...?"

08 23 47 08 LMP Yes.

08 23 48 01 CMP Well, we got the pan camera figured out for the new whole show, huh?

08 23 48 04 LMP Really?

08 23 48 08 CMP (Laughter).

08 23 48 10 LMP Stop laughing, you son of a gun, you ...

08 23 48 12 CMP I - I'm happy that it's even ready to come to, it's such a complicated bunch of shit.

08 23 48 25 CMP Okay, these return pictures should come out in the ... see what happens ...

08 23 48 57 CMP Another - Yes. As soon as we get through this other color, you can hand me that other MAG, and I'll get set up for the Earth pictures. I think I'll keep holding it. ... your problem. Why don't - -

08 23 49 12 LMP You know, this thing's ... about 30 degrees ...

08 23 49 17 CDR That right?

08 23 49 21 CMP ... that thing somewhere.

08 23 49 28 LMP ...

~~CONFIDENTIAL~~

08 23 49 41 LMP ... would you hold that thing?

08 23 49 43 CDR Damn right. Just sitting there, looking at the Moon.

08 23 50 12 CDR ...

08 23 50 19 CMP ... all right? ... What'd I do with my MAG. Here it is.

08 23 50 27 CDR Did you take that cover off?

08 23 50 29 CMP No, not lately. ...

08 23 50 30 LMP ...

08 23 50 32 CMP Huh?

08 23 50 33 LMP Take that ...

08 23 50 45 LMP ...

08 23 50 48 CMP Move it up a little.

08 23 50 51 LMP ...

08 23 51 00 CMP ... Yes, take these a little bit later.

08 23 51 11 CMP How's that?

08 23 51 13 LMP That's about the only way you can get them.

08 23 51 15 CMP ...

08 23 51 21 LMP Try to move them.

08 23 51 25 CMP What?

08 23 51 26 LMP Try to move them up one.

08 23 51 28 CMP Yes. No?

08 23 51 37 LMP Just going to leave these tied down.

08 23 51 45 CMP ... vertical?

08 23 51 57 CDR Hey, watch the ... Be sure you don't get any of the crap out of that one.

~~CONFIDENTIAL~~

08 23 52 06 CMP Yes.

08 23 52 07 CDR You ...?

08 23 52 10 CMP Yes, that was my Hasselblad pack right here.

08 23 52 12 CDR Well, that wouldn't ...

08 23 52 18 LMP Really need to take a Hasselblad MAG with you.

08 23 52 20 CMP Yes, give me a Hasselblad MAG ...

08 23 52 24 LMP ...

08 23 52 29 CMP Yes, you're right.

08 23 52 30 LMP ...

08 23 52 43 LMP ...

08 23 52 46 CMP Yes.

08 23 53 03 CMP ...

08 23 53 08 LMP All you really need ...

08 23 53 12 CMP ...

08 23 53 14 LMP Yes.

08 23 53 15 CMP Okay.

08 23 53 25 LMP Mine's here. ...

08 23 53 31 CMP Here are mine, okay. ...

08 23 53 37 LMP ...

08 23 53 40 CMP I'll take them.

08 23 53 47 LMP ...

08 23 53 50 CMP How you like them? Okay?

08 23 53 52 LMP ...

08 23 53 59 CMP Look for yours, pal.

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[REDACTED]

08 23 54 00 LMP (Laughter).

08 23 54 04 CMP You should be proud - you should be proud of yourself, Jim.

08 23 54 16 CMP Do you intend ignoring that question? Are you a naive ...?

08 23 54 24 LMP I answered it. Hey, you got to get your -

08 23 54 26 CMP God! What a posthole digger.

08 23 54 29 LMP Chief priority. Time to do the P20. ... do it?

08 23 54 37 CMP ...

08 23 54 44 LMP Oh. ...

08 23 55 17 LMP ...

08 23 55 25 CMP Jim, how long has it been since weight? ... says part 1 - part 2, part 2. All the rest of you ready?

08 23 55 36 LMP Yes.

08 23 55 38 CMP DAC should be set for right now. Got to notify the ...

08 23 55 50 LMP ...

08 23 56 07 CMP Y'all noticing that all that noise is gone?

08 23 56 11 LMP What?

08 23 56 12 CDR I don't know if ...

08 23 57 13 CMP You ignoring that Flight Plan?

08 23 57 15 LMP Cut it.

08 23 57 17 CMP Aw, you ain't that bad. Catch it, son.

08 23 57 23 LMP ... won't come down. Help me?

08 23 57 45 CMP All right, God damn you, come help me.

08 23 57 49 CDR Boy, oh, boy.

[REDACTED]

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08 23 57 51 LMP All these MAGs ... 2 and a half by 2 millimeter. ...

08 23 58 01 CMP ... bracket.

08 23 58 03 LMP Got a ... bracket.

08 23 58 04 CMP That's 80 millimeter ... up there.

08 23 58 10 LMP No. ... I gave it to you.

08 23 58 33 CMP Hope you don't roll the ... back in there.

08 23 58 38 LMP Can't believe it.

08 23 58 42 CMP Ah! Okay, 2.8, 1/500th, and click one off - which I just blew.

08 23 59 00 CMP Okay.

08 23 59 14 CDR Hey, what time did -

08 23 59 17 CMP Yes.

08 23 59 18 CDR Got that one?

08 23 59 19 CMP Yes, that at the - T-start time, yes.

08 23 59 21 CDR Yes.

08 23 59 26 CMP That solar corona is kind of interesting. You might watch it out the window there. You - you can really - you can really see it.

08 23 59 42 CMP That's right.

08 23 59 44 CDR Are you going ... from here?

08 23 59 46 CMP Well, ENTER. That doesn't work right. Oh, you're trying to ENTER on NOUN 18.

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DAY 10

09 00 00 00 CDR Oh, my. I've got to have a NOUN.

09 00 00 09 CMP NOUN 18 is attitude. Gimbal angles. There's time.

09 00 00 19 CDR Well, ...

09 00 00 20 CMP You loaded - you loaded gimbal angles, to drive to, for some reason.

09 00 00 25 CDR ...

09 00 00 27 CMP Is it going there? You changed the gimbal angles in - in P20.

09 00 00 33 CDR Why didn't I get a P50?

09 00 00 38 CMP Because you were probably already - you were probably just getting to the P20 attitude.

09 00 00 41 CDR ... each time. Why don't we both do 20? You've taken up enough pictures.

09 00 00 48 CMP Did you ENTER on the re - Did you ENTER on it when you got to the attitude?

09 00 00 54 CDR No.

09 00 00 55 CMP Well, that - Okay. Call up P20 again and go through that. Okay.

09 00 01 03 CDR I get a NOUN 18 ... NOUN 78. ... NOUN 18.

09 00 01 12 CMP What'd you do?

09 00 01 13 CDR ... option 5?

09 00 01 16 CMP Yes. Option 5. Yes.

09 00 01 24 CDR You ... another 20?

09 00 01 26 CMP Okay? Go.

09 00 01 28 CDR 5.1. ...?

09 00 01 29 CMP Yes - -

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09 00 01 30 CDR - - ...? 5.2?

09 00 01 31 CMP That's good.

09 00 01 32 CDR ...?

09 00 01 37 CMP Oh, it wasn't to the attitude yet, Dave. No wonder. You're in - you're in HOLD over there.

09 00 01 46 CDR Sure enough.

09 00 01 48 CMP Oh! Blew it!

09 00 01 53 CDR Well, all I know is I got that needle.

09 00 01 54 CMP Sure. We're in LOW RATE.

09 00 01 58 CDR ... needle ...

09 00 02 09 LMP All I know is - -

09 00 02 10 CDR Can I load P30 now?

09 00 02 11 CMP No.

09 00 02 12 CDR ...

09 00 02 13 CMP No. Not when we're in maneuver. They won't let you in.

09 00 02 22 CDR So that's what I did wrong.

09 00 02 24 CMP Yes. That's why you - that's why you loaded - -

09 00 02 25 CDR I heard - -

09 00 02 26 CMP - - the NOUN 18.

09 00 02 27 CDR Well, I thought you said - -

09 00 02 28 CMP It'll come up in a major mode but you won't get - -

09 00 02 29 CDR Oh, I thought - -

09 00 02 30 CMP - - You won't get a time display. Yes. You can't; it shuts off the power to display, like a NOUN 18.

09 00 03 01 CMP That T-start is right now, too.

~~CONFIDENTIAL~~

09 00 03 04 CDR ...

09 00 03 07 CMP Uh -

09 00 03 12 CDR 216.

09 00 03 14 CMP 216:03. That's right.

09 00 03 16 CDR We have 15 minutes.

09 00 03 18 CMP No, we're at 216:03 right now.

09 00 03 23 CDR ... We'll never complete ...

09 00 03 28 CMP Yes, we will. That's been all - Well, let's see. Let's get the stick and put in a higher rate in the DAP. Jim?

09 00 03 35 LMP Get the stick?

09 00 03 36 CMP Yes.

09 00 03 50 CMP What the hell's that ... lll. Okay.

09 00 04 03 CMP Okay. I think that does it. I should have played a 3 while I was at it. Huh.

09 00 04 12 LMP What?

09 00 04 13 CMP I should have put in a 3 and really zapped it around.

09 00 04 26 CDR Three ...

09 00 04 28 CMP Yes.

09 00 04 29 CDR Three is a what? ...?

09 00 04 31 CMP Three is 2 degrees per second. We better do it.

09 00 04 34 CDR ...

09 00 04 35 CMP I don't know if I can hit the stick again, only -

09 00 04 41 CDR How about the boom? Is that extended?

09 00 04 43 CMP We got the boom now?

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09 00 04 44 CDR I don't know.

09 00 04 46 CMP Well, what's the Flight Plan say?

09 00 04 51 CDR Yes, better not.

09 00 04 52 CMP Better not. Yes.

09 00 04 54 CDR You want the ..., don't you? ...

09 00 04 58 CMP Yes, we're almost there.

09 00 05 00 CDR Okay.

09 00 05 01 CMP Yes, we don't have to start here until - Got 5 minutes left - 80 - 8:55.

09 00 05 11 CDR Why is that coming up? Why didn't it come down?

09 00 05 14 LMP Because the mission timer starts. ... Flight Plan ...

09 00 05 18 CMP Yes, because - yes, because of that one.

09 00 05 20 CDR ...?

09 00 05 21 CMP No, this is the mission timer. That - this was - this - Yes?

09 00 05 26 CDR Mission timer, do you set the start and T-stop ...?

09 00 05 29 CMP That's right. No. We're not doing it because we're using P30 instead.

09 00 05 33 CDR Be cool if we set the mission timer anyway.

09 00 05 35 CMP Oh, yes. Sure.

09 00 05 37 CDR And use our GET?

09 00 05 38 CMP You can get it off the DSKY. Hell, the goddam thing's already stopped twice - on its own.

09 00 05 45 CDR What? This one stopped twice?

09 00 05 46 CMP Yes.

09 00 05 47 CDR Really?

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09 00 05 48 CMP Yes.

09 00 06 03 CMP You can't read that DET from over here.

09 00 06 06 CDR What?

09 00 06 07 CMP You can't read it from over here to begin with.

09 00 06 14 LMP I got a good idea.

09 00 06 16 CDR ... fails if you move.

09 00 06 21 CMP Well, you - you got the date.

09 00 06 24 CDR ...

09 00 06 26 CMP Yes. You tried G&N and comp fail?

09 00 06 30 CDR Yes.

09 00 06 31 CMP You tried G&N and comp fail? You're screwed anyway.

09 00 06 36 CDR Better start getting our ... TEI.

09 00 06 43 CMP Well, I think that's - kind of pushing the rules.

09 00 06 56 LMP Y'all are getting freaked up.

09 00 06 58 CMP Yes. We might.

09 00 07 05 CDR Need a piece of tape. Ought to be a piece of tape around here somewhere.

09 00 07 13 LMP Yes.

09 00 07 14 CDR Okay.

09 00 07 15 CMP Are you there?

09 00 07 16 CDR Okay.

09 00 07 17 CMP Yes, call up P30 and put those numbers in the -

09 00 07 45 CDR Yes ... zero.

09 00 07 47 CMP I'd just - Yes, I'd just leave all those in there or just load it zero. Okay. ... Doesn't make any difference.

CONFIDENTIAL

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09 00 08 12 CDR Got 417.

09 00 08 16 LMP ... FREE? You want to let it be for a while?

09 00 08 20 CMP Yes, we should. On, no, wait. No, that's okay. Those maniacs can wait on Dave. It won't damp.

09 00 08 28 CDR Huh?

09 00 08 29 CMP It won't damp because we're in ORB RATE.

09 00 08 31 CDR You want to go FREE?

09 00 08 32 CMP Yes. Okay. Okay, now - look at those times and remember them, Dave.

09 00 08 43 CDR Okay.

09 00 08 44 CMP It starts - Well, the first one's at 5 minutes and then we go 6:40 and every 10 seconds after that. Okay?

09 00 08 51 CDR You ... for that?

09 00 08 52 CMP Yes.

09 00 08 55 CDR Got it.

09 00 08 56 CMP Okay, you ready? Okay.

09 00 08 59 CDR MARK. One cycle.

09 00 09 35 CDR Oh!

09 00 09 40 CMP Now turn out all the MDC lights, and just let - watch the DSKY LEB - if - if you can find one down there.

09 00 09 48 CDR MARK. Forty.

09 00 09 50 CMP Yes.

09 00 10 15 CDR Forty.

09 00 10 16 CMP Okay.

09 00 10 24 CDR Thirty.

~~CONFIDENTIAL~~

09 00 10 34 CMP Okay.

09 00 10 35 CDR MARK.

09 00 10 36 CMP Okay, I got the time. You can watch, if you want.

09 00 10 41 CDR You want a mark at 2:50?

09 00 10 42 CMP Yes. No, I'll - I'll get it. Just watch out the window.

09 00 10 45 CDR MARK. 2:50.

09 00 10 46 CMP Enjoy the scenery.

09 00 11 46 CMP If that time is good enough, boy, you wait. At 8 minutes, the Sun'll show.

09 00 11 51 CDR Fifty-five.

09 00 11 52 CMP Yes.

09 00 11 53 CDR Ga! Boy!

09 00 11 55 CMP Isn't that something?

09 00 11 56 CDR Woo-hooo!

09 00 11 57 CMP Isn't that something?

09 00 11 58 CDR Yes, man!

09 00 11 59 CMP (Laughter)

09 00 12 00 CDR Woo-hoo-hooo!

09 00 12 01 CMP I thought you'd like that (laughter).

09 00 12 02 CDR That's something again! (Laughter) Wheee!

09 00 12 04 CMP Okay - DAC off.

09 00 12 07 CDR That's something ...

09 00 12 09 LMP ... Cycle one frame.

09 00 12 11 CDR Okay (laughter). Boy, I love stuff like that.

~~CONFIDENTIAL~~

09 00 12 19 CMP Now that's pretty spectacular.

09 00 12 21 CDR It sure is. That's just right between the eyeballs.

09 00 12 23 CMP Yes. You don't expect it. Oh, yes! Okay. Okay, lift the ... away. Oh, we got - we got a little time. No - there's no big rush.

09 00 12 46 LMP Okay, remove DAC from window, cover lens, and run at 24 frames per second.

09 00 12 49 CMP Yes.

09 00 12 51 LMP Shutter speed, 1/500th, for 2 seconds.

09 00 12 54 CMP Yes.

09 00 13 04 LMP Cover lens?

09 00 13 05 CMP Yes.

09 00 13 12 LMP CMC MODE, AUTO. Record the MAG.

09 00 13 25 CMP Okay, we're down to about - oh, 60 percent of the frame, I guess.

09 00 13 33 LMP Sixty percent?

09 00 13 34 CMP Sixty percent of the MAG, yes.

09 00 13 35 LMP How about your frame?

09 00 13 46 CMP 100.

09 00 13 49 LMP Okay.

09 00 13 56 CMP Yes.

09 00 13 58 LMP ... what?

09 00 14 00 CMP Now, which one you want to use? Use this one?

09 00 14 27 CMP Okay, we got 1/125th, got - -

09 00 14 29 LMP What's your MAG number? Need that.

09 00 14 31 CMP ... Yes.

~~CONFIDENTIAL~~

09 00 15 18 CMP Okay ... get it up there and get it going, we'll be all right. ... Why don't you run one across this way? Now hold it.

09 00 15 58 CMP Okay, I want back ... Yes, that ought to do it. Run this one down through here.

09 00 16 05 LMP ...

09 00 16 08 CMP What?

09 00 16 09 LMP I don't think you guys'll make it, frankly.

09 00 16 11 CMP No (grunt).

09 00 16 35 CMP ... back it off. Oh, yes, that's right. We don't move now, anyway.

09 00 16 52 CMP Okay.

09 00 17 10 LMP ...

09 00 17 15 CMP Did you let the ... down?

09 00 17 18 CDR No.

09 00 17 21 LMP ... - -

09 00 17 22 CMP Yes.

09 00 17 23 LMP - - ...

09 00 17 24 CMP Huh! (Sigh) Okay.

09 00 17 44 LMP ...

09 00 17 46 CMP Yes, we got it. Is that what you got on there?

09 00 18 00 CDR ...

09 00 18 07 CMP Rate's down.

09 00 18 13 CDR ...

09 00 18 17 CMP Yes. That's - that's about right, Dave.

09 00 18 21 CDR ...

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09 00 18 22 CMP Huh?
09 00 18 24 CDR ...
09 00 18 35 CMP Yes. Okay.
09 00 25 37 CDR Did we do a P20?
09 00 25 38 CMP Yes.
09 00 25 41 CDR I thought we called P20 now, Al.
09 00 25 43 CMP Yes, just recall P20. It should do it itself. No, if you get the UPLINK ACTIVITY light, that means it's gone outside the 10-degree dead band, in which case you have to do a VERB 58 - to get back in.

TIME SKIP

09 01 32 39 CDR Back to normal now.
09 01 32 40 CMP Okay. ...
09 01 32 41 CDR Okay.
09 01 33 11 CDR ...?
09 01 33 13 CMP No, ... 15.
09 01 33 16 CC Endeavour, recall the 50 18 and get the attitude, please.
09 01 33 27 LMP Well, I can do it. But -
09 01 33 40 LMP But my needles are not close to center. The needles are not very close to center.
09 01 33 50 CDR I can't hear you.
09 01 33 51 LMP You can't hear me?
09 01 33 52 CDR No.
09 01 33 54 LMP Well, you're not on comm. Yes.
09 01 34 08 LMP We're off about - 20 degrees in pitch.

~~CONFIDENTIAL~~

[REDACTED]

09 01 34 45 LMP ENTER.

09 01 34 50 CDR ...

09 01 34 58 LMP As soon as you get the 50 18, you hit the ENTER.

09 01 36 13 CDR ...?

09 01 36 15 LMP Yes.

09 01 36 20 CDR Now. ...

09 01 36 34 LMP What?

09 01 36 36 CDR ...

09 01 36 40 LMP I can't hear you. Can you get SQUELCH, ENABLE on? There's so much noise in the S-band. I can't hear anything. Yes, I can hear you now.

09 01 37 04 CDR ...

09 01 37 12 LMP Why'd they tell us to PRO, then? That wasn't the right thing to do, was it?

09 01 37 15 CDR ...

09 01 37 17 LMP Yes.

09 01 37 19 CDR ...

09 01 37 21 LMP Yes.

09 01 37 23 CDR ...

09 01 37 24 LMP Well, we had a 50 18 - flashing. But we'd already gone past the 10 degrees, apparently. And they told us to PRO.

09 01 37 31 CDR ...

09 01 37 33 LMP Yes.

09 01 37 34 CDR ...

09 01 38 55 LMP Dave, if you want to put this away, you can. It'd be down in - in R-13, in the camera compartment on

[REDACTED]

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that side. There's a bag there - you know, the
MAG bags from the LM.

09 01 39 06 CDR ...

09 01 39 07 LMP No, let's see. Okay, yes. Right in there. See
that MAG bag with six in it?

09 01 39 19 CDR ... right in there ...

09 01 39 21 LMP No. We have B and A, and - and that one, and
there's another one that was good in there.

09 01 39 33 LMP The others just won't drive.

09 01 41 09 LMP Not bad. Did real well, Dave.

09 01 41 43 LMP I'd better be watching the Flight Plan for this
page, because there are a lot of little notes I
put in there that -

09 01 41 49 SC ...

09 01 41 51 LMP Kind of hard to understand, yes.

09 01 43 18 CDR Need it now?

09 01 44 13 CDR Think you can ... tomorrow? Think you ... tomorrow?

09 01 44 19 LMP That won't be hard to do.

09 01 44 20 CMP ...

09 01 44 30 LMP A little tennis.

09 01 44 34 CDR ...

09 01 44 37 LMP I'm going to be worried, too, if I don't have that
FCS ... on. I should say the FCS - (laughter).
Should say the FCS. All day, Al. We'll be in
those suits and won't be able to take a crap.

09 01 44 54 CMP Okay. ...

09 01 45 33 LMP I'll look it up there. The menu today - Today is - -

09 01 45 45 CMP We're ready to ...

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[REDACTED]

09 01 45 50 LMP We have turkey and gravy, wet pack. Cranberry - orange - pineapple fruit cake. Vanilla pudding, which we had yesterday (laughter). And citrus beverage.

09 01 47 08 CDR Okay. ... down below.

09 01 47 12 LMP Yes. I can cut, if you want to put water in them.

09 01 47 52 CMP ... don't see why ... camera for terminator photos.

09 01 47 56 CMP ...

09 01 48 15 CDR Okay.

09 01 49 43 CMP ... shave.

09 01 49 46 CDR Is it? ...

09 01 50 06 CMP ... wet pack, turkey and gravy.

09 01 50 35 CMP ... minus 5 ...

TIME SKIP

09 02 11 01 LMP Okay. We need GAMMA RAY, BOOM, RETRACT.

09 02 11 19 LMP After about 3 minutes 15 seconds, it should be gray, and then we'll turn it off.

09 02 11 41 CMP ..., Jim. ... one whole week ...

09 02 11 45 LMP I'll take the cheese.

09 02 11 49 CMP ... all right ...

09 02 12 07 LMP No. No. I - there'll be plenty of time for canned.

09 02 12 12 CMP ...

09 02 12 13 LMP No. No, this tube was good.

09 02 12 18 CDR ... camera went out ... right, Al?

09 02 12 31 CMP ... mapping camera ...

[REDACTED]

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09 02 12 51 LMP Y'all want to try the tube?

09 02 13 38 CMP ... mapping camera right now. ...

09 02 13 46 LMP Hope so.

09 02 14 08 CMP ...

09 02 14 13 LMP One minute to terminator photos, Dave.

09 02 14 16 CDR ...

09 02 15 04 LMP 15, 19.

09 02 15 18 CMP How long?

09 02 15 20 LMP One minute and 40 seconds.

09 02 15 28 LMP Something on my window. I don't know why they put -

09 02 15 39 LMP Al, would you turn the LASER ALTIMETER, ON? LASER ALTIMETER, ON.

09 02 16 09 LMP And MAPPING CAMERA, IMAGE MOTION, ON. Barber pole plus 4. Yes.

09 02 16 25 LMP No, I just want it ON now. They don't want it - don't want it - you to do that until after you turn it ON.

09 02 16 33 LMP Yes, but it doesn't say IMAGE MOTION, INCREASE, until after we turn it on - turn the MAPPING CAMERA, ON.

09 02 17 24 LMP Okay, Al. If you'll turn the MAPPING CAMERA, ON. Yes.

09 02 17 32 CMP ... want?

09 02 17 33 LMP And IMAGE MOTION, INCREASE to barber pole plus 4.

09 02 18 45 LMP Yes.

09 02 19 53 LMP See that crater out there - I don't know whether you can see it out your window, Dave. The one I mentioned looked like it had a contact right through it; one half of it was gray and the other half was white.

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09 02 20 02 CDR ...

09 02 20 05 LMP It's right out here. Just east of - that good Russian crater, Svodska [sic] - Sovolska [sic].

09 02 20 18 CMP ... it's a Russian crater.

09 02 20 23 LMP Sbodska [sic].

09 02 20 25 CDR Sklodowska.

09 02 20 26 LMP Sklodowska.

09 02 20 29 CDR ...

09 02 20 53 LMP Yes.

09 02 21 07 LMP Okay, we're supposed to configure the DSE. Stop, COMMAND RESET, and REWIND.

09 02 21 13 CDR All right.

09 02 21 24 LMP It's on the - the REWIND, right - the RECORD ...

TIME SKIP

09 03 30 10 CMP Good.

09 03 30 13 LMP Got them?

09 03 30 16 CMP Got them. Okay. Okay, and I'll go ahead and torque those out on the minute. Just give me a mark.

09 03 30 24 LMP Okay.

09 03 30 58 LMP Stand by, Al.

09 03 30 59 CMP Okay.

09 03 31 00 LMP MARK.

09 03 31 05 CMP Okay, we'll just check it out here.

09 03 31 17 CC 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.

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09 03 31 31 CMP Boy, that puts that star smack in the middle. Beautiful. Okay. Are we in P20, Jim?

09 03 31 45 LMP Yes, P20's coming up. Option - -

09 03 31 46 CMP We - -

09 03 31 47 LMP - - option 5.

09 03 31 48 CMP We were in it before, weren't we?

09 03 31 50 LMP Yes.

09 03 31 51 CMP Okay. Okay, we got it for TEI ascent. No, wait a minute.

09 03 32 00 LMP Okay. It calls for GDC ALIGN. Yes, you went back in P20; I'll go CMC MODE, AUTO, huh?

09 03 32 08 CMP Yes, go AUTO.

09 03 32 10 LMP Okay, then GDC ALIGN.

09 03 32 14 CMP That has to be done from your couch there.

09 03 32 16 LMP Yes.

09 03 32 18 CMP Can you do it?

09 03 32 20 LMP I can do one. I'll - probably use the checklist. It's been a long time since I've gone through one.

09 03 32 33 LMP Minus 5 and 25.

09 03 32 43 CDR ... burn, Al? Get all your ... all set? No, you're ... open.

09 03 32 48 CMP Yes, I guess it would ...

09 03 32 50 CDR ... TEI?

09 03 32 52 CMP Put the optics away. ...

09 03 32 56 LMP Well, we might as well get in our regular couches then, huh?

09 03 32 59 CDR What?

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09 03 33 00 LMP Do you want me to switch around to regular couches there?

09 03 33 02 CDR Yes. ...

09 03 33 07 LMP A GDC ALIGN is required. And then a P20. I think we need to - change the deadpan [sic] - dead band.

09 03 33 25 LMP And when we come - come around, we get the maneuver pad.

09 03 33 28 CMP How long until the shaping burn?

09 03 33 29 LMP Two hours.

09 03 33 31 CDR No. ...

09 03 33 33 CMP Well, we ought to start getting cleaned up then for it. Let's see. Yes, yes. We don't have a sheet. Okay.

09 03 33 55 LMP ... G&C Checklist, I guess that - Where's that in the G&C Checklist? Let's see what we're doing here.

09 03 34 02 CDR ...?

09 03 34 06 LMP Okay. Let's see what I've got here now. I'll do the - do a GDC ALIGN, huh?

09 03 37 10 CDR Did you ... the JETT bag, Al?

09 03 37 12 CMP Yes. ... got it here in B-1.

09 03 37 26 LMP Hey, Al. We want to change the dead band in P20 here - -

09 03 37 29 CMP Yes.

09 03 37 30 LMP - - 5 degrees.

09 03 37 31 CMP Okay. Do a VERB 22 NOUN 79.

09 03 37 40 LMP Oh, I see that. Is that all you have to do? You don't have to - while we're in a - -

09 03 37 42 CMP That's all you have to do.

09 03 37 48 LMP Just put in this entry bit, huh?

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09 03 37 49 CMP Yes.

09 03 37 50 LMP Plus 005 00?

09 03 37 51 CMP Yes.

09 03 37 58 LMP Okay. That's entered.

09 03 38 07 CMP Okay. That should do it then.

09 03 38 35 LMP Need any help, Al?

09 03 38 36 CMP No, I can get it all right, Jim.

09 03 39 43 LMP Let's see, did we decide to throw those two urine bags and the JETT bag? I don't have to - transfer those?

09 03 39 48 CMP Don't dump those yet. We're going to jettison them.

09 03 39 52 CDR Yes, we can just jettison them.

09 03 39 53 CMP Yes.

09 03 39 54 CDR When is the next dump period?

09 03 39 58 LMP Coming up in about 2 hours.

09 03 39 59 CDR Before the burn, I guess.

09 03 40 09 LMP Hmmm. After the burn.

09 03 40 23 LMP Just after the burn is the dump.

09 03 40 25 CDR Oh, really?

09 03 40 26 LMP Yes.

09 03 41 54 CMP We're in pretty good shape, Dave, except I don't know what to do with LEVA bags for the burn.

09 03 41 58 CDR With the what?

09 03 41 59 CMP With the LEVA bags.

09 03 42 00 CDR You got straps for them, to clamp - to clamp them down. No. There are three straps down on the EVA tunnel ... - -

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09 03 42 08 CMP Hmm.

09 03 42 09 CDR And strap down those - and I'd suggest that somebody reach up and strap - and strap them down.

09 03 42 13 CMP Could be we better do that.

09 03 42 15 CDR You got them?

09 03 42 16 CMP Yes. They ought to put the utility straps in the -

09 03 42 17 CDR We better get these other cameras tucked away, too. Where would you suggest putting - -

09 03 42 21 CMP Hey!

09 03 42 22 CDR - - these cameras we got?

09 03 42 23 CMP Why not put them all in B-1? We could stuff that JETT bag around them so they won't get banged up too much. They'd probably all fit in there.

09 03 42 35 LMP Or you could just put them in the JETT bag?

09 03 42 39 CMP Well, we might want to use them again.

09 03 42 41 LMP Well, we know where they are. Yes.

09 03 43 01 CMP What's this bag here?

09 03 43 03 CDR What?

09 03 43 04 LMP That's your tether kit.

09 03 43 06 CMP Oh. Okay.

09 03 43 13 CDR You're going to need it.

09 03 43 14 CMP That's good. That's good.

09 03 43 17 CDR ...

09 03 43 18 LMP Everything except the PPK.

09 03 43 20 CMP Yes. What's - what was in that PPK, by the way?

09 03 43 35 CDR I don't see how you can get used to it with all these bags, huh?

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09 03 43 37 CMP Yes.

09 03 44 05 LMP ...

09 03 44 07 CMP ...

09 03 45 39 CMP Um.

09 03 46 04 CMP Um. Um-huh - -

09 03 46 10 CDR What?

09 03 46 11 CMP - - Very interesting. I don't know. I'll let you know in a minute. Oh, there we are. Christ, I thought they were - I thought somebody'd blown it.

09 03 46 20 CDR Huh?

09 03 46 21 CMP I thought somebody'd blown it. The OPS straps weren't in the OPS strap pouch.

09 03 46 26 CDR You don't think - -

09 03 46 27 CMP Yes (laughter). Huh?

09 03 46 29 CDR You don't think that ...

09 03 46 30 CMP Yes, who'd do something like that?

09 03 46 32 CDR ...

09 03 46 33 CMP (Laughter) Yes.

09 03 47 01 CMP Okay.

09 03 47 37 CDR You know, I think we better dump - we better dump those out. We better not put them in the JETT bag.

09 03 47 44 CMP Huh?

09 03 47 45 CDR Probably ...

09 03 47 46 CMP Yes, they're apt to break.

09 03 47 53 CDR You don't have to dump. Jim will help you.

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[REDACTED]

09 03 47 56 CMP (Laughter) Yes. Okay, how about gathering up as many of the utility straps as you can around. Let's see if we can get enough here to put these LEVAs down.

09 03 48 13 CDR There's some up here in ... I can't disagree with gathering them up.

09 03 48 54 CMP These won't work on here.

09 03 49 01 CDR Pull on it here. Pull those out just a little.

09 03 49 08 CMP Here, Jim. I think this is yours.

09 03 49 12 LMP Mm. It's anybody's ...

09 03 49 20 CDR Huh?

09 03 49 21 LMP ...

09 03 49 22 CDR In here?

09 03 49 38 LMP ...

09 03 49 40 CMP Which? Oh, yes.

09 03 49 43 LMP ...

09 03 49 46 CMP Yes, that one - I cleaned it out. And that - we're going to have to use that tomorrow.

09 03 49 51 LMP ...

09 03 49 53 CDR So you want to put that into B-1.

09 03 49 57 LMP ...

09 03 49 58 CMP Yes.

09 03 50 22 CDR Hey, Al? ... gamma ray and alpha ray and ... all that stuff ...

09 03 50 31 CMP Not supposed to, Dave. They don't - they don't like it.

09 03 50 35 CDR ... they give us 2 minutes to dump.

09 03 50 37 CMP Two minutes?

[REDACTED]

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09 03 50 39 CDR Yes, 2 minutes between dumping and turning on all that gamma, X-ray, and alpha ray stuff.

09 03 50 43 CMP Well, the gamma - We'll turn it on.

09 03 50 46 CDR What?

09 03 50 47 CMP We'll turn it on.

09 03 50 49 CDR It'll screw it up, won't it?

09 03 50 50 CMP Well, it ain't going to screw up the experiment. It'll screw up their data. And they'll go back to the Flight Plan and look, and they'll say, "Yes, sure, they're dumping."

09 03 51 24 CMP Where's the other needle there, Jim?

09 03 51 26 LMP We aren't even counting ...

09 03 51 27 CMP We don't care about that. Dave, if you can reach around there on the back of you, on that LEVA that I put on the - on the - on A-8 back there, there's another stop towards the head end - If you want, go ahead and snap it.

09 03 51 40 CDR Over this one - -

09 03 51 41 CMP Yes, I already put a strap on it, but I couldn't reach it.

09 03 51 47 CDR ...

09 03 51 50 CMP (Laughter) Yes.

09 03 52 01 CDR ...

09 03 52 02 CMP Huh?

09 03 52 03 CDR You may not believe it, but there's no snap - -

09 03 52 05 CMP Oh, there's no snap up there? Oh, shit! Can we tie it to something up there?

09 03 52 16 CDR Yes.

09 03 52 17 CMP Actually, it'll be all right with one strap probably. It won't - -

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09 03 52 20 CDR ...

09 03 52 27 CMP No, it's not going to go anywhere.

09 03 52 38 CMP In fact, these other snaps don't really cinch things down tightly; they just kind of hold them in place.

09 03 53 28 CDR ...

09 03 54 06 CDR Gee, we're running out of snaps.

09 03 54 08 CMP Hey, I bet you we can put a couple of bags and a couple - helmets in the top of the PGA bag.

09 03 55 00 CDR ... if you use these ...

09 03 55 04 CMP Okay. Yes, we'll be using it on the way home. But we can put it away for now. It's probably just as well.

09 03 55 11 CDR Yes.

09 03 55 14 LMP It's hot in here. You want to undo it?

09 03 55 15 CMP Yes. That's an easy one.

09 03 55 22 CDR ...

09 03 55 23 CMP By the UVs and goes into A-8, though.

09 03 55 25 CDR What?

09 03 55 26 CMP Goddam U thing - UV thing goes in the A-8, and that's underneath all the LEVAs and everything else.

09 03 55 33 LMP ... somewhere else ...

09 03 55 38 CMP Excuse me, Jim.

09 03 56 15 LMP ...

09 03 56 17 CMP Yes, they go down here.

09 03 56 37 CMP What else have we got?

09 03 56 39 CDR Pardon?

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09 03 56 40 CMP (Laughter) Before - before I go tearing into those lockers again, what else have we got?

09 03 56 43 CDR ...

09 03 57 08 CMP Yes. Where's MAG R?

09 03 57 16 LMP Ah, I think it's ... there.

09 03 57 18 CMP Is it used up yet?

09 03 57 19 LMP Yes, it is. Didn't we do it - -

09 03 57 21 CMP All right. Stash it away here then.

09 03 57 26 LMP Here's R. Does it belong there with all that stuff?

09 03 57 29 CDR I don't think ...

09 03 57 31 CMP I got three hands full. How about the dark slides for our -

09 03 57 46 CDR ...

09 03 57 47 CMP Huh?

09 03 57 53 CDR ... use one of those?

09 03 57 55 CMP No.

09 03 57 56 CDR Huh?

09 03 57 57 CMP Uh-huh.

09 03 57 58 CDR What about the ...?

09 03 57 59 CMP Have to pull it on. The N-pack, too.

09 03 58 04 CDR ...

09 03 58 05 LMP ...

09 03 58 25 CMP Get me that cinch. I must be getting weak.

TIME SKIP

~~CONFIDENTIAL~~

[REDACTED]

09 05 46 28 LMP ... it in the SIM bay, huh?

09 05 46 31 CDR Yes.

09 05 46 44 CDR Okay. Waste water's down to about 20.

09 05 46 57 LMP Okay, we'll purge. Are you going to time her?

09 05 47 01 CDR Uh-huh.

09 05 47 35 SC ...

09 05 47 38 CDR Fifty.

09 05 47 48 CMP Up to RELIEF, huh?

09 05 47 49 LMP Yes.

09 05 47 50 CDR Uh-huh. Up to RELIEF, right?

09 05 48 03 LMP Eighty degrees.

09 05 48 07 CDR ... to do that on the front-side pass?

09 05 48 09 LMP Yes.

09 05 48 12 CMP Think we'll be okay once we get out in the -

09 05 49 05 CDR H₂ PURGE LINE HEATERS, OFF.

09 05 49 08 CMP All you got to do is look after the purge, huh?

09 05 49 09 CDR Yes.

09 05 49 11 LMP I'm going to purge.

09 05 49 30 CDR We got this great big filter floating around. Why is that floating around?

09 05 49 34 LMP I'm sorry, Dave. I'll throw it in the diaper bag.

09 05 49 36 CDR Gee, Jim, we got to make another burn.

09 05 49 39 LMP Yes.

09 05 49 44 CMP I didn't realize we were so close to another burn. ... close.

[REDACTED]

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09 05 49 47 CDR No, I didn't either.

09 05 49 52 CMP ...

09 05 49 55 CDR Yes.

09 05 50 09 CDR Where'd you put the second garbage can?

09 05 50 10 CMP ...

09 05 50 22 CDR Al, wait. Stick it up here. No, wait.

09 05 50 58 CDR Did you have any tissues down here when you did your thing, Jim?

09 05 51 01 LMP No, I didn't have any, Dave.

09 05 51 03 CDR How did you get by?

09 05 51 05 LMP How'd I get by? I used the - -

09 05 51 06 CDR Yes.

09 05 51 07 LMP - - UCTA. I used the UCTA. So I had to dump it anyway.

09 05 51 15 CDR Yes. Right over there with the camera is, we got to configure the DAC anyway. Open it up. You got to put the DAC together anyway for photographing the subsat.

09 05 51 42 CDR What? Yes. Didn't think about that.

09 05 59 01 LMP ... in the way.

09 05 59 04 CMP I'll get it - -

09 05 59 05 CDR Okay, I got it.

09 05 59 06 CMP Okay.

09 05 59 12 CDR There. ...

TIME SKIP

09 06 17 54 LMP Clear.

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[REDACTED]

09 06 18 00 CMP Oh, my. Look at this. That's a good picture.

09 06 18 06 CC Hello, Endeavour; this is Houston.

09 06 18 10 CDR Houston, Endeavour. Go.

09 06 18 15 CC Roger, Endeavour. We're requesting you verify your systems - DATA SYSTEMS, ON, and the S-band - -

09 06 18 21 CMP Yes.

09 06 18 22 CDR Right here it is.

09 06 18 23 CC - - AUX switch to SCIENCE, please.

09 06 18 24 CMP Huh!

09 06 18 25 CDR Yes.. That's verified, isn't it?

09 06 18 28 CMP No, DATA SYSTEMS isn't ON.

09 06 18 30 CDR Well, it wasn't in here then.

09 06 18 35 CMP It sure was and I missed it. I'm sorry.

09 06 18 40 CDR Okay; that's verified now, that the DATA SYSTEMS are ON now.

09 06 18 46 CMP Shoot!

09 06 18 48 CDR They're easy to overlook, aren't they?

09 06 18 49 CC Okay, Dave; we copy that. I've got a map update, REV 75, when you're ready to - -

TIME SKIP

09 07 47 33 CMP You get the other ones. THRUST A and B to NORMAL after the PRO.

09 07 47 37 CDR Roger.

09 07 47 45 CMP One minute.

09 07 48 11 CDR And there's the average g coming up. Twenty-nine seconds.

[REDACTED]

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09 07 48 18 CMP EMS MODE, NORMAL -
09 07 48 19 CDR NORMAL.
09 07 48 22 CMP Twelve seconds ullage.
09 07 48 33 CMP ULLAGE.
09 07 48 37 CDR Ready for the PRO?
09 07 48 38 CMP Ready for the PRO.
09 07 48 39 CDR Okay, 99 PROing.
09 07 48 45 LMP B valves.
09 07 48 46 CDR There it goes.
09 07 48 48 CMP Oop! Steady.
09 07 48 49 LMP - - 4 - 5 - 6 - -
09 07 48 50 CMP A's on.
09 07 48 51 LMP A valves.
09 07 48 53 CMP Looks good.
09 07 48 57 CDR EMS and G&N agree.
09 07 48 59 CMP Good.
09 07 49 04 CDR Tracking 217 now. GDC looks good.
09 07 49 11 CMP Man alive! Watch them push.
09 07 49 13 CDR Powering down now. Okay, we trim here in about -
just short of 100.
09 07 49 18 CMP Okay. DSKY and EMS look good, at about 50.
09 07 49 24 CDR On the dead band?
09 07 49 26 CMP Roger.
09 07 49 34 CMP DSKY and EMS are running about 35.
09 07 49 45 CDR GDC looks good.

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09 07 49 46 LMP One minute. ...

09 07 49 56 CDR Tracking 219.

09 07 50 01 LMP Are we going to decrease on the - flow valve, Al?

09 07 50 06 CDR Okay, EMS and DSKY are about 50. You got about a minute to go.

09 07 50 11 CMP Roger.

09 07 50 16 CDR Tracking 220. EMS and DSKY look good.

09 07 50 37 CDR Tracking 221. Looks very good.

09 07 50 40 CMP Okay.

09 07 50 41 CDR Twenty-five seconds to go.

09 07 50 43 CMP Roger.

09 07 50 46 CDR Twenty seconds to go.

09 07 50 52 LMP Okay, here comes the count. 10, 9 - -

09 07 50 59 CDR ..., Al?

09 07 51 00 LMP - - 8, 7, 6, 5, 4, 3, 2, 1, 0 -

09 07 51 07 CMP THRUST, OFF; automatic.

09 07 51 11 CDR Okay, babe, your trim's to .2. Forget the Y.

09 07 51 15 CMP Wait. Forget the Y?

09 07 51 16 CDR No, you - X and Z, forget the Y.

09 07 51 18 CMP Okay. We'll let .2 ... again. Okay, Jim.

09 07 51 25 LMP Okay. I'm ready. 1, 2, 3, 4 - TVC SERVO POWER 1 and 2, OFF.

09 07 51 33 CMP OFF.

09 07 51 34 LMP MAIN BUS TIES coming OFF.

09 07 51 55 CDR Right on 221. Right down the tube.

~~CONFIDENTIAL~~

09 07 51 58 CMP Yes. Good act.
09 07 52 02 CDR Yes - -
09 07 52 04 CMP I'd swear ...
09 07 52 05 CDR - - ...
09 07 52 06 LMP Okay, Al, EMS FUNCTION, OFF.
09 07 52 08 CMP OFF.
09 07 52 09 LMP EMS MODE, STANDBY.
09 07 52 10 CMP STANDBY.
09 07 52 11 LMP RHC and THC, locked.
09 07 52 12 CDR Locked.
09 07 52 13 LMP DEADBAND, MAX.
09 07 52 14 CMP MAX.
09 07 52 15 LMP TRANSLATION CONTROL POWER, OFF.
09 07 52 16 CMP OFF.
09 07 52 17 LMP ROT CONTROL POWER, DIRECT, two, OFF.
09 07 52 18 CMP DIRECT, OFF.
09 07 52 19 LMP BMAG MODE, three, RATE 2.
09 07 52 20 CMP RATE 2.
09 07 52 21 LMP CB DIRECT ULLAGE, two, open.
09 07 52 22 CDR Open.
09 07 52 23 LMP CB SPS, PITCH 1 and YAW 1, open.
09 07 52 26 CMP YAW 1, open.
09 07 52 27 LMP CB SPS PILOT VALVES, MAIN B, open.
09 07 52 30 CDR B - -

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Day 10

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09 07 52 31 CMP MAIN A and MAIN B, both open.
09 07 52 33 LMP Okay, CB EMS, two, open.
09 07 52 34 CDR They're open.
09 07 52 35 LMP Okay. PCM BIT RATE going LOW.

~~CONFIDENTIAL~~

[REDACTED]

[REDACTED]

[REDACTED]

DAY 11

10 02 28 08 LMP Cool it here for a minute.

10 02 28 20 CDR Okay, Houston; 15. It looks like we have a good seal. How's it look down there? (Cleared throat)

10 02 28 42 CDR Okay, thank you. Okay, 601, OPEN? 601, REPRESS O₂, OPEN.

10 02 28 49 CMP It's OPEN.

10 02 28 50 CDR Monitor REPRESS O₂ indicator to zero.

10 02 29 00 CMP Okay. It looks zero now, Dave.

10 02 29 02 CDR Okay. So, you let your umbilical flow bring every - the cabin up to 3.

10 02 29 07 CMP Roger.

10 02 29 11 CDR That's very nicely done. That's about - 22 minutes. Which is just about what we figured. You went back and looked at all that stuff. So that's just about right.

10 02 29 52 CDR It's fun out there, isn't it?

10 02 29 54 CMP Mm-hmm. Should have stayed longer.

10 02 29 57 CDR (Laughter) You done good. You made a lot of people back there very happy.

10 02 30 04 CMP Roll over and let me take another look again.

10 02 30 11 CDR Well, I'll tell you what, your - your left arm or something's covering up the light over there.

10 02 30 16 CMP The OPS is, I guess.

10 02 30 19 CDR Really bad lights in here.

10 02 30 20 CMP Okay, there. I can see it now.

10 02 30 23 CDR We're at 2.4, about. So we'll just let your flow bring it up to 3. Gee, I had a great view on the TV. Did you turn the TV off, Jim?

[REDACTED]

[REDACTED]

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10 02 30 39 LMP No, I didn't - -

10 02 30 40 CMP I'll turn it off.

10 02 30 41 CDR Can you reach it?

10 02 30 42 CMP Yes. There. Thought I turned it off.

10 02 30 53 CDR Can you reach the SCIENTIFIC TV switch? The S-band TV switch, Jim?

10 02 30 59 LMP No, not yet, Dave.

10 02 31 01 CDR Okay. Maybe I can. No.

10 02 31 06 LMP I don't think there's any rush on that, is it?

10 02 31 08 CDR No.

10 02 40 36 CMP I'll get it.

10 02 40 38 CDR Here, give me it first, Al.

TIME SKIP

10 05 13 15 CMP We need the repress time on the cabin. ...

10 05 13 18 CDR Yes.

10 05 13 53 CDR Ten days and 5 hours we've been gone, Jim.

10 05 13 59 CMP Long time. We beat your old record.

10 05 14 00 CDR By 3 minutes.

10 05 14 03 CMP Sure does. Went farther from home, too.

10 05 14 10 CDR That's great.

10 05 14 11 CMP Didn't go as far.

10 05 14 13 CDR Let's not count the miles.

10 05 14 15 LMP ...

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10 05 14 16 CDR Huh?

10 05 14 17 CMP Didn't go as far, but went farther.

10 05 14 19 LMP Yes, coming back.

10 05 14 22 CDR And a lot more fun, too.

10 05 14 30 CMP A lot more to it.

10 05 14 35 CDR Big Dipper, do you know, on 9, we could have missed any one thing and pressed on.

10 05 14 41 LMP Yes.

10 05 14 42 CDR Here, it's a lot different; you can't miss anything and press on.

10 05 14 46 CMP Well, it looks like we can't miss anything.

10 05 14 49 CDR Very different. Very different.

10 05 15 13 CDR This is sort of an all-or-nothing kind of operation, you know it?

10 05 15 18 CMP Yes, it really is, you know. It's really all your eggs in one basket, boy. I got to thinking about that after you guys left for your descent. Once you start that descent, man, that - that's it - -

10 05 15 40 LMP We're all hanging out.

10 05 15 41 CMP We're there. That's right. It's all hanging out from there on.

10 05 15 46 LMP ...

10 05 15 54 CMP It would be better for ... to put pills in all the food drawers.

10 05 15 59 CDR (Laughter) For sure.

10 05 16 02 CMP Make him ...

10 05 16 03 CDR Let's put them away somewhere.

10 05 16 07 CMP Where will I put them? It's the last time I'm saying it, but you better not lose your pills.

10 05 16 13 CDR You didn't see them in your TSB, did you, Jim?

10 05 16 16 LMP What?

10 05 16 17 CDR You didn't see the pills in your TSB when you cleaned out, did you?

10 05 16 20 LMP No. ...

10 05 16 31 CDR Ohh, what did I do with it?

10 05 16 33 LMP ...

10 05 16 34 CMP It's almost back to normal times.

10 05 16 38 CDR Where did you see them?

10 05 16 40 LMP Down in U-1.

10 05 16 45 CMP Do you really know what ...?

10 05 16 48 LMP ...

10 05 16 49 CMP ...

10 05 16 57 CDR Oh! Did you notice anything loose?

10 05 17 03 CMP Well, I thought I saw - Well, I saw a - -

10 05 17 08 CDR Hey, do you guys ... get some orange juice? ... Let's enjoy it - let's enjoy it while we can.

10 05 17 16 CMP ...

10 05 17 17 CDR Except for bad stuff, we can always put up with it for 1 more day.

10 05 17 20 CMP Yes, that's right. Well - Hey, let's - ... will be our last meal. We have three meals below and breakfast ... 1 day.

10 05 17 28 CDR And a long way to go.

10 05 17 29 CMP Oh, hush.

[REDACTED]

10 05 17 37 CMP Hello, Houston; this is 15. Loud and clear, and I got your first message, Karl. Sorry.

10 05 17 45 CC ..., Al. We've got some sort of problem on the ground circuits here. ... in contact with you.

10 05 17 51 CMP No, we're here.

10 05 17 55 CC Roger. Very good.

10 05 18 46 SC (Cough)

10 05 18 53 CC Al, I have a couple of questions from ...

10 05 18 58 CMP Oh, yes. That's right. That's great. Okay, Karl. I'll tell you what, I'll give you a call back in about 10 minutes when I'm ready.

10 05 19 11 CC ...

10 05 19 14 CMP No, he's got some questions on the SIM bay.

10 05 19 37 CDR SIM bay looks pretty good.

10 05 19 42 LMP What'd ...?

10 05 19 43 CMP I'm coming. I'm coming, Jim. ...

10 05 19 46 LMP Yes, I can see through on the handles.

10 05 19 55 CMP I didn't even see any scorching or any burning or anything down there.

10 05 19 59 LMP ...

10 05 20 02 CMP The covering on the - on the service module, if it hadn't been covered, boy, that would have been burned and scarred and scorched and everything else.

10 05 20 10 CDR Yes. That's right.

10 05 20 11 LMP Yes. Yes. Excuse me 1 second, will you?

10 05 22 11 CMP Excuse me, Jim. Let me get out of your way here.

10 05 22 27 CDR ...

10 05 22 28 CMP Really?

[REDACTED]

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10 05 22 49 CMP Well, I guess it doesn't make any difference on this food if we take it back home anyway.

10 05 22 58 CDR Yes, that's probably true. They can decontaminate it back there.

10 05 23 02 CMP Sure.

10 05 23 03 CDR You can tell them we ran out, though. Do you think this salad's good, Al?

10 05 23 11 CMP My what?

10 05 23 12 CDR Sandwich spread ... It's a whole half a can.

10 05 23 16 LMP ...

10 05 23 17 CDR Sure you can, Jim.

10 05 23 18 CMP We have to finish after you.

10 05 23 21 LMP Okay, I'll eat it.

10 05 23 23 CMP That's right.

10 05 23 24 LMP What?

10 05 23 30 CDR If you wouldn't complain so much, we wouldn't leave you so much.

10 05 23 33 LMP You guys didn't leave me nothing.

10 05 23 36 CMP Freak you!

10 05 23 38 LMP I'm thinking

10 05 23 39 CMP (Laughter)

10 05 24 10 CDR What kind of desserts we got there, Jim? A lemon pudding, huh?

10 05 24 16 CMP Mmmm.

10 05 24 46 LMP ...

10 05 24 50 CMP Yes, you're right, mouth, and I'm going to catch it ...

10 05 24 58 LMP I'm ready, if you can catch it.

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10 05 24 59 CMP (Cleared throat) That's the only way a power bowler makes it.

10 05 25 04 LMP ...

10 05 25 14 CDR Huh? Yes, I suppose we ought to think about doing that. We can get to all that stuff now.

10 05 25 20 LMP Bright idea. ...

10 05 26 00 CDR I would.

10 05 27 56 CDR That's a pretty good sandwich.

10 05 27 59 CMP Mm-hmm.

10 05 29 27 CDR How much food we got left?

10 05 29 32 CMP I don't know, at least a couple of days.

10 05 31 04 CDR Six-foot waves in the recovery area, huh?

10 05 31 05 CMP Yes.

10 05 31 06 CDR That'll be sporty.

10 05 31 08 CMP Yes, if we can dodge and land, that's great.

10 05 31 11 LMP Yes.

10 05 31 15 CMP That's better than dead calm.

10 05 31 21 CDR It is?

10 05 31 23 LMP Yes. ...

10 05 31 25 CMP It's probably because the power's ...

10 05 31 27 LMP Hmm.

10 05 31 28 CDR That's why we had so much trouble on 9. ...

10 05 31 41 CMP Why can't we just hop on over her pretty good in that fashion, too?

10 05 31 46 CDR Yes.

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10 05 31 49 LMP It's not that bad, boys.

10 05 33 27 CDR Houston, 15. Go ahead.

10 05 33 31 CC ...

10 05 33 41 CDR Okay, Karl. Thank you.

10 05 33 47 CMP Okay, Houston. Boy, oh, boy, I used to think it was a good thing to get on a flight and then they could only talk at you one at a time. Whew, boy! Now, I think it's a good thing to get back so you - you don't have to listen to that goddam radio all the time.

10 05 35 00 CMP The DAC, yes. But the Hasselblad's above your head.

10 05 35 05 CDR No, mine's - I don't think so. No, that's Jim's.

10 05 35 13 LMP What else we got?

10 05 35 28 CMP It's time for the UV stuff, huh? Let me get out of your way. You couldn't find any more pills, right?

10 05 35 36 LMP ...

10 05 35 41 CMP No, I thought I put them in your TSB. I just saw them hanging there just before we started all that stuff, and I don't know.

10 05 36 02 LMP ...

TIME SKIP

10 05 50 03 CDR Why don't you get the ...?

10 05 51 26 CMP Okay.

10 05 51 27 LMP Don't forget to ...

10 05 51 29 CMP ION - ION SOURCE to STANDBY.

10 05 51 41 CC ...

10 05 51 46 CMP Okay.

[REDACTED]

10 05 51 47 CC ...

10 05 52 01 CMP Okay. Minus 76 and 117.

10 05 52 13 CC Okay. We copied your comment on the SIM bay door jettison, and further questions go as follows. The white coating in the SIM bay, were - did you notice that any of them were obviously discolored or - or coated from contamination or overheating?

10 05 52 35 CMP I saw no evidence of heating in the SIM bay. I saw no evidence of discoloration of the white surfaces. There were (cleared throat) as - as best I could tell, no particulate matter that had come to rest on any of the surfaces in the SIM bay. It looked very, very clean. And - even at a - across the top of the mapping camera were - was a - -

10 05 57 51 LMP ... and just delete the note here.

10 05 58 00 CC ... Stand by 1 second. 247 plus 30. Also, we would like to add "MASS SPECTROMETER MULTIPLIER, HIGH; DISCRIMINATOR, LOW."

TIME SKIP

10 08 00 56 CMP Okay, good deal.

10 08 00 57 LMP Just completed one.

10 08 00 59 CDR Did you do one?

10 08 01 00 CMP Yes. I'll talk to him. Bob, we just completed one retraction for 33 seconds.

10 08 01 06 CC Okay, we're starting our time.

10 08 01 11 CMP ...

10 08 01 15 LMP And away we go.

10 08 01 17 CMP ...

10 08 01 44 LMP Hey, you woke up just in time to eat again, Dave.

10 08 01 51 CDR ... fresh.

[REDACTED]

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10 08 01 54 CMP To sleep in ... work ...

10 08 02 08 CMP Okay, valve pressure is getting good and ... is ...

10 08 02 14 CMP Surge tank pressure greater than 400?

10 08 02 15 LMP Yes, 487. ...

10 08 02 36 CMP ...

10 08 02 48 CDR Any surge?

10 08 02 50 LMP Yes, it's 600.

10 08 02 52 CMP ...

10 08 02 54 LMP Yes.

10 08 03 00 CDR ...

10 08 03 03 CMP Yes. ...

10 08 03 13 CDR ...

10 08 03 16 CMP You got that solar stuff?

10 08 03 17 CDR ...

10 08 03 26 LMP Sure a relaxed schedule here today.

10 08 03 28 CMP We're going along all right until we get to ...

10 08 03 39 LMP You never do any more UV work, Al?

10 08 03 42 CMP Yes, we get another one tomorrow.

10 08 04 11 LMP Hand me the log there, will you? Oh, we don't have the log out, do we?

10 08 04 16 CMP ... find it.

10 08 04 21 LMP It might be in my TSB. My ... TSB.

10 08 04 33 CMP ...

10 08 05 06 LMP Let's see. I have a G&C Checklist over here. But I don't have the - I don't have the other good information. I take it back; I have it. I have it.

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10 08 06 20 LMP Did you take any UV photos in - in orbit?

10 08 06 28 CC 15, Houston. Over.

10 08 06 30 CMP Go ahead. Go ahead, Houston.

10 08 06 38 CC Roger, 15. We'd like to get a PITCH of minus 40 and YAW, 90, for the HIGH GAIN ANTENNA. And then, if you change your antenna switch to HIGH GAIN without hitting the COMMAND RESET switch, we'll maintain comm that way, please.

10 08 06 59 CMP Yes. Okay.

10 08 08 30 CC Apollo 15, Houston. Over.

10 08 08 36 CMP Go ahead, Houston.

10 08 08 39 CC Negative. You did the right thing without us calling you. Thank you.

10 08 08 45 CMP Whatever that was, okay.

10 08 08 49 LMP Are we going to press on with the high gain?

10 08 09 21 CDR Yes, yes. If you just get your ... down here, ...

10 08 09 30 CMP Ah, mark it.

10 08 09 32 CDR ... We want to take four breathing samples and do our ... What do we have - we have about 50 left to make, don't we?

10 08 09 40 LMP We have 50 in this one.

10 08 09 41 CDR ...

10 08 09 43 CMP Okay.

10 08 09 44 CDR ...

10 08 09 52 LMP Yes.

10 08 09 53 CDR ...

10 08 13 23 CMP ... change that one.

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10 08 13 24 CDR Bring it in ...

10 08 13 28 LMP You should bring that. I used the scissors to cut mine on the LM, but - Is there a file on the end of those scissors?

10 08 13 43 CMP I don't think so. That one's ...

10 08 13 54 CDR Not much of a file, huh?

10 08 14 00 LMP I got a razor blade (laughter).

10 08 14 02 CDR ...

10 08 14 12 CMP Yes.

10 08 14 13 LMP Yes.

10 08 14 14 CDR ...

10 08 14 16 CMP Okay.

10 08 14 17 LMP Okay.

10 08 14 18 CC 15, Houston. Your rates look good to us ...

10 08 14 21 CMP Okay, Bobby.

10 08 15 38 LMP Maybe we better turn the heat up a little in here.

10 08 15 42 CDR Getting cold?

10 08 15 45 LMP My feet are a little cold. I wonder where my - my little slippers went.

10 08 15 51 CDR ...

10 08 15 53 CMP Open up my - open up my sack. Here's my little slipper.

10 08 15 58 CDR ...

10 08 15 59 LMP Get me into my slippers in here.

10 08 16 00 CMP Are they yours?

10 08 16 01 CDR Two-hundredths.

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[REDACTED]

10 08 16 16 LMP I'll take them.

10 08 16 21 CMP ...

10 08 16 25 CDR ...

10 08 16 26 LMP Yes.

10 08 16 27 CDR ...

10 08 16 31 LMP Yes, I think I did.

10 08 16 32 CDR ...

10 08 16 42 LMP No. I think I - There is one.

10 08 16 43 CDR Are you sure, Jim?

10 08 16 55 LMP The last time I saw it, we - it was in B-1. You know, wrapped in there with the - the JETT bag. But it's not in there any longer.

10 08 17 04 CDR ...

10 08 17 06 LMP No, it's not in there now. Just - just the - -

10 08 17 10 CDR ...

10 08 17 11 LMP It's not in there now.

10 08 17 12 CDR ...

10 08 17 14 LMP I don't know, Dave. I'll have to look. I don't know - I don't know who took that stuff out of B-1.

10 08 17 20 CMP ... - -

10 08 17 21 LMP What'd you - Al, the one - the cam - we had the 500 - millimeter camera, Al?

10 08 17 27 CDR ...

10 08 17 30 LMP Yes.

10 08 17 31 CDR Remember, we pulled the cameras out ... and put them in the JETT bag.

[REDACTED]

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10 08 17 35 LMP Yes.
10 08 17 36 CDR I gave you yours, and you ...
10 08 17 39 LMP You gave me my camera at that time?
10 08 17 41 CDR Yes, ...
10 08 17 45 LMP Tell me where it is and I'll look.
10 08 17 46 CMP Yes.
10 08 18 38 LMP Did you find ...?
10 08 18 39 CMP Yes.

TIME SKIP

10 08 32 09 LMP I think this package of MAGs goes into - A-8.
10 08 32 12 CDR ...
10 08 32 17 LMP Ah, you think so, huh?
10 08 32 41 CMP Should be pictures ... we used all that film. ...
It picked up a little here ...
10 08 32 55 CDR Who's going to ...?
10 08 32 58 CMP Where's your bag? ...
10 08 33 06 CDR It's down here right now. I got to get these
straightened out.
10 08 33 18 CMP ...
10 08 33 28 CMP Yes.
10 08 33 29 CDR ...
10 08 33 39 CMP I'd like - I'd like to get a MAG of that, too.
Start eating it. ...
10 08 33 58 CDR ...
10 08 34 06 LMP The MAG, you mean?

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10 08 34 08 CDR ...

10 08 34 12 CMP Well, no matter what you do, it's got to come back tightly, before you start it.

10 08 34 17 CDR I knew you could, but you could - you could do it ... perfect here, or you could ... Now can you get it started?

10 08 34 30 CMP Yes.

10 08 35 41 LMP Al, one pack of this film goes in A-8, the 70s in the LM.

10 08 35 48 CMP Yes.

10 08 36 07 CMP ... 40. Want three of them?

10 08 36 10 LMP Yes.

10 08 36 12 CMP Did you get three?

10 08 36 13 LMP Yes.

10 08 36 14 CMP Okay.

10 08 36 19 LMP We're going to get the other three in today. We'll have 13. We'll have to split the package up.

10 08 37 07 CMP ... We can put some MAGs in here.

10 08 37 09 LMP Yes.

10 08 37 11 CDR We only got this one MAG.

10 08 37 16 CMP ... that?

10 08 37 18 CDR Right on. Why don't we just ...?

10 08 37 23 CMP Probably, because nobody can ...

10 08 37 25 LMP Probably.

10 08 38 32 LMP ... in there? Al. That bag is much too big to fit in there.

10 08 38 43 CMP ... but we can certainly get ...

10 08 38 47 CDR We need one bigger than this, though.

10 08 38 49 LMP Well, this bag probably should not have come over from the LM. I used this bag, though, to wrap up these - these MAGs. You know, neither one have been used.

10 08 39 29 CMP I think they might be ...

10 08 39 51 CDR What are you going to get out of here?

10 08 40 01 CDR Carry it for me. Can't help but be better.

10 08 40 12 LMP You got to work - work it out.

10 08 40 15 CMP ... that one ...

10 08 40 18 CDR ...

10 08 40 19 CMP I wouldn't ...

10 08 40 22 CDR Yes, I wouldn't ...

10 08 40 25 CMP Yes. Tool - tool B on the - wait - wait a second.

10 08 40 48 LMP Tool B or tool E?

10 08 40 51 CMP Tool B.

10 08 40 53 LMP From the LM?

10 08 40 55 CC Apollo 15, Houston. It's retract time.

10 08 41 01 CDR Thank you, Bob.

10 08 41 41 CDR What?

10 08 41 46 LMP Hey, I forgot to cut - I didn't cut the ion off.

10 08 41 50 CDR Cut the ion ...?

10 08 41 52 LMP No. We should have cut the hammock straps. Should have got those, too, before we jettison them.

10 08 43 01 CDR No, those are the LM pans. ...

10 08 43 22 CMP Hey, Dave? Yes, you got them.

TIME SKIP

10 08 56 37 LMP We do UV photos twice. Two more - UV photos two more times.

10 08 56 45 CDR ... your film.

10 08 57 13 CMP It's kind of nice having some room down here, isn't it?

10 08 57 16 CDR It sure is.

10 08 58 31 LMP You don't want to go through this contamination control with the vacuum cleaner, do you, Dave?

10 08 58 36 CDR I don't think we're required to do it.

10 08 58 38 LMP Okay.

10 08 58 41 CMP ...

10 08 58 43 CDR No, we don't ...

10 08 58 45 CMP We don't ...? ... mention down-range control. They're standing by to give some water on it anyway.

TIME SKIP

10 09 19 15 LMP Oh, and then CDR doffing biomed harness. LMP donning. Alpha X-ray. Let's get a little SIM bay and then eat. Eat and then we do a canister change. You do a little P23 stuff. Then we'll get ready to go to bed.

10 09 19 46 CMP Three hours to bedtime.

10 09 19 50 CDR ... sleep. ...

10 09 20 05 CMP ... 3 to 4 hours ...

10 09 20 22 CDR ... here?

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10 09 20 25 CMP ... - -

10 09 20 26 LMP Otherwise, it would have been pretty boring.

10 09 20 28 CDR ...

10 09 21 32 CMP ...

10 09 21 39 CDR ...

10 09 21 40 CMP ...

10 09 21 50 LMP (Laughter)

10 09 21 51 CMP ...

10 09 21 55 LMP Yes.

10 09 21 56 CMP ...

10 09 22 06 CDR ...

10 09 22 09 LMP You work mighty hard, I'll tell you.

10 09 22 11 CDR What ...?

10 09 22 12 LMP You work mighty hard.

10 09 22 20 CDR ...

10 09 22 23 LMP No, a little ...

10 09 22 35 LMP I wish I would have tried running alongside the Rover at a - the same pace, you know, to see how - -

10 09 22 42 CDR You'd have never stayed with it, Jim. You know
... - -

10 09 22 47 LMP Yes, true.

10 09 22 48 CDR - - ...

10 09 22 56 LMP I would have liked to have, you know, to run alongside of it. It'd been neat to do a few things like that, you know.

10 09 23 01 CDR What?

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[REDACTED]

10 09 23 02 LMP It'd been neat to try a few things like that.

10 09 23 04 CDR Yes. I know. Yes. ...

10 09 23 43 LMP You can take off your biomed harness, Dave.

10 09 23 44 CMP Whoo!

10 09 24 05 LMP He'll lose sleep for 9 hours tonight.

10 09 24 08 CDR Good! ...

10 09 24 35 CDR Can you see the Moon?

10 09 24 36 LMP Oh, yes.

10 09 25 45 CMP Can you get that? Thank you.

10 09 25 58 LMP On a lunar eclipse - Let's see, we take a total there of -

10 09 26 06 CDR ...

10 09 26 07 LMP No, we take some with the EL.

10 09 26 10 CDR Yes.

10 09 26 11 LMP Yes. We take eight with the EL.

10 09 26 13 CDR What kind?

10 09 26 14 LMP Color.

10 09 26 17 CMP ...

10 09 26 27 CDR Yes, eight with color.

10 09 26 40 LMP Here's some more Lunar Orbiter.

10 09 26 44 CDR Is that the same?

10 09 26 47 LMP No, you have it on two different pages.

10 09 26 51 CDR Oh, yes.

10 09 26 54 LMP Hey, what was this one for?

10 09 27 08 CDR Don't you have any more?

[REDACTED]

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10 09 27 09 CMP ... think we need any ...

10 09 27 12 CDR Yes. ...

10 09 27 15 LMP It's in the lockers.

10 09 27 20 CDR ... more?

10 09 27 22 CMP ... time to figure it out - figured out ...

10 09 27 26 CDR Going to give them ...?

10 09 27 31 CMP ...

10 09 27 34 CDR ...

10 09 27 38 CMP Yes, you got to reckon with him yet.

10 09 27 40 CDR Huh?

10 09 27 41 CMP You're going to have to reckon with him yet on those ...

10 09 27 42 CDR Yes. ... make sure to recommend that he ...

10 09 27 49 CMP Yes.

10 09 27 52 CDR ...

10 09 28 00 CMP Yes.

10 09 28 24 CC 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.

10 09 28 34 CMP Roger, Bob.

10 09 29 51 CDR (Laughter) They can't tell that, I don't think.

TIME SKIP

10 09 43 03 CDR There must be a MAG around somewhere. There must be two of them.

10 09 43 07 CMP In the bag.

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[REDACTED]

10 09 43 09 CDR Okay.

10 09 43 11 CMP Now, all we're missing is S, per his ...

10 09 45 32 CMP Is that MAG hooked up?

10 09 45 35 CDR I don't know.

10 09 45 58 CMP I've got - I've got two whole reels of color stereo.

10 09 48 50 CMP Yes, that goes back up for ...

10 09 48 55 CDR Why?

10 09 48 56 CMP Why?

10 09 48 57 CDR Why?

10 09 49 08 CDR Let's see. Next is the ...

10 09 52 53 CDR Huh?

10 09 55 17 CDR Huh?

10 09 55 26 CMP One more time. Ready?

10 09 55 27 CDR Yes.

TIME SKIP

10 10 10 38 CMP You got it?

10 10 10 39 LMP Over here.

10 10 10 40 CDR Oh, yes.

10 10 12 22 CMP God damn.

10 10 12 23 CDR Huh?

10 10 13 11 CDR Al, what all is there?

10 10 13 29 CMP We have turkey.

10 10 13 34 CDR Turkey?

[REDACTED]

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10 10 13 35 CMP Yes.
10 10 14 22 CDR Do we have something extra for lunch?
10 10 14 37 CMP Ham.
10 10 15 26 CDR As you're loading it.
10 10 15 29 CMP Oh, I - you know, I think we can do it with ...
10 10 16 03 CMP Ah, yes.
10 10 16 16 CDR Hey, I'd - I'd like to ... Yes. ...

TIME SKIP

10 10 35 08 CMP I'm just fine. Just fine.
10 10 35 24 CMP I'm so damn happy; nobody could give me any better service.
10 10 37 40 CDR What seems to be ...?
10 10 38 20 CMP Hey, what do you ...?
10 10 38 25 CDR Yes. Yes, ...
10 10 38 44 CDR ...
10 10 38 45 CMP ...
10 10 38 48 CDR ...
10 10 39 30 CMP Yes, I guess the worst thing in the world would be to try to do something like that and not be able to do it.
10 10 39 35 LMP Oh, boy, ...
10 10 39 50 CMP Tired?
10 10 39 52 CDR Yes.
10 10 40 01 CMP Well, I'll tell you, I'm sure glad we got rid of that clothesline operation ...

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10 10 40 06 LMP ...

10 10 40 16 CMP In fact, it's really a ball, when you get all suited up, get cooled off, and get the hatch open.

10 10 40 24 LMP Sounds good. Sounds real good.

10 10 40 29 CDR Oh, it's great.

10 10 40 32 CMP The Sun would have been some better - It would have been better if it could have been a little bit higher. Because when I went down around the side of the mapping camera, it was pretty dark.

10 10 40 47 CDR Yes.

10 10 41 06 CDR Yes.

10 10 41 19 CMP Boy, I hope the - I hope the TV came out all right.

10 10 41 23 CDR Yes. ...

10 10 41 25 CMP Did you? Okay. ...

10 10 43 17 CDR Got them. Got them.

10 10 43 18 CMP Okay.

10 10 43 19 CDR Somehow they got way down in there - -

10 10 43 20 CMP Well, we didn't lose anything of value out the hatch. ...

10 10 43 23 CDR Everything's okay.

10 10 43 25 CMP We lost a spring clip. We lost a paper clip - -

TIME SKIP

10 10 57 43 CMP Want me to write?

10 10 57 46 CDR Where do you want this? In your ...?

10 10 59 24 CDR Okay. Plus four balls 8, minus three balls 67, plus three balls 54.

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10 10 59 34 CMP Wait a minute; maybe that's 34.

10 10 59 41 CDR Oh, yes.

10 10 59 42 CMP Yes.

10 11 00 23 CDR Oh, you screwed up.

10 11 01 29 CMP Yes, sir, Bob, you bet you. It sure is beautiful.

10 11 01 35 CDR You say that sure has been planned for me?

10 11 01 41 CMP Yes, ...

10 11 02 08 CDR ...

10 11 02 09 CMP The platform gets us home without a midcourse, by golly.

10 11 02 16 CDR No range error, but pressure's a little low.

10 11 02 18 CMP Hey, Jim. While you're down there, we need a canister change. Twenty-one into B. Stow 19 in A-4.

10 11 03 51 CDR Twenty-one. Yes. Twenty should be in A. Get it out of A-4.

10 11 04 21 CDR No!

10 11 04 22 CMP ... catch it.

10 11 05 03 CDR That a boy.

10 11 05 04 CMP Lock her, Dave. You can ...

10 11 05 07 CDR ...

10 11 05 09 LMP Yes, it is. I think we can ... I hate to use those pulleys.

10 11 05 16 CDR ...

10 11 05 20 CMP Yes. If you use your own tool.

10 11 05 30 LMP ...

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[REDACTED]

10 11 05 34 CDR Who stole my ...? (Cough) Boy, ..., didn't I?
10 11 05 44 CMP ...
10 11 07 32 CMP What are you doing?
10 11 07 42 CMP Thank you, Davey.

TIME SKIP

10 12 19 16 LMP What are you doing there, man?
10 12 19 18 CDR ...
10 12 19 21 LMP Did you find it?
10 12 19 33 CMP That's better.
10 12 19 36 CDR ...
10 12 19 37 LMP Yes, I wouldn't know the switches on it.
10 12 19 41 CDR Houston, Apollo 15.
10 12 19 46 CC Apollo 15, go.
10 12 19 48 CDR Hi, Bob; got a presleep checklist for you.
10 12 19 55 CC We're ready.
10 12 19 57 CDR Okay.
10 12 19 58 CC Dave, hold on. We got a ...
10 12 20 16 CC Okay, 15, we're back with you. We just had a site
changeover.
10 12 20 21 CDR Okay. Crew status is all good; no medication. And
I've got the onboard read-outs, if you've got a
pencil.
10 12 20 31 CC I've got a pencil.
10 12 20 33 CDR All righty. Starting with BAT C: 37.0, 37.0,
37.0; RCS A is 56, B is 50, 48, and 52. And I

[REDACTED]

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guess everything else has been done, and you should have got your E-memory dump. 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.

10 12 21 11 CC 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.

10 12 21 21 CDR How about that? Oh, that's pretty good. We got a good navigator.

10 12 21 27 CC And, 15, let's hold a couple of minutes while we check some data on the SIM bay and then we'll go to the MOCR one more time. And we'll be back with you in final status, I hope.

10 12 21 40 CDR (Laughter) Okay, we got - we got time. We're not quite ready to go to bed yet.

10 12 22 04 CDR (Laughter) Bob says, if he - says, okay, let me go around to the MOCR and check it and come back with your final status, I hope.

10 12 22 24 CDR But, you know, they got to old Joe, I can tell. Joe's changed. He's a changed man. They had him, boy.

10 12 22 32 LMP They did?

10 12 22 33 CDR They were all over his ass during that EVA. He was just really humping. That poor fellow - I bet he's exhausted.

10 12 22 49 CDR He probably had so damn many inputs, he didn't know which way to go.

10 12 23 04 CMP ...

10 12 23 08 CDR Huh?

10 12 23 09 CMP ... apart.

10 12 23 14 CDR Oh, he's pretty close to them. That - that group's all tied together pretty well. Yes. It was in

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[REDACTED]

pretty good shape. We got all those guys out on the field trips and sat down and talked to all of them, and that - that group's pretty well squared away.

10 12 23 28 CMP ...

10 12 23 32 CDR No, they're in the back room. And the guy who really comes up to him is Jerry Griffith.

10 12 23 40 CMP Oh, yes?

10 12 23 41 CDR He's really the experiments officer. But - -

10 12 23 45 LMP Who's Jerry Griffith?

10 12 23 46 CMP Yes (laughter).

10 12 23 47 LMP ...

10 12 23 48 CMP Yes.

10 12 23 50 CDR And - But it really goes from Gordon Swann through Griffith to the Flight Director to Joe. And it's - it's a straight loop because Griffith and Griffin both understand the problem, so it - it isn't any big deal. Except that all the other people who aren't in the loop and don't understand were there - all the guys up in the back row with their input - with them.

10 12 24 12 LMP ...

10 12 24 15 CDR Jerry Griffin said he - one of his main problems was going to be holding the people off behind him - you know, to let Joe do his job, and I'm sure it was ... - especially when they can see it all on the TV. And they're clanked - -

10 12 24 29 LMP They're all there?

10 12 24 30 CDR Yes. They're all clanked up anyway. Then we go up on top of some big frigging mountain or stand right next to some big frigging valley, and, you know, they can't do anything about it; they're all bunched up like a nickel cigar.

[REDACTED]

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10 12 24 40	LMP	... They ... and ...
10 12 24 44	CDR	Yes.
10 12 24 45	LMP	And ...
10 12 24 46	CDR	Yes.

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DAY 12

11 00 35 37 CC Roger.

11 00 37 17 CMP It's a quiet morning.

11 00 37 19 CDR Say again?

11 00 37 20 CMP It's a quiet morning.

11 00 37 21 CDR Yes.

11 00 38 47 CMP Maybe that means that they come from the Sun. Huh?

11 00 38 51 CDR Hmm.

11 00 38 57 CMP Very interesting. Or that the window shield's cutting them off.

11 00 39 02 CDR No, we had the window shields up before.

11 00 39 04 CMP Did we?

11 00 39 05 CDR Yes.

11 00 39 06 CMP Um hum.

11 00 39 07 CDR Because we had them - the cockpit all dark.

11 00 39 08 CMP Be dark. Yes.

11 00 39 09 CDR Yes, that's right. We did. The only difference now is that the Sun's behind - -

11 00 39 13 CMP We're not - we're not pointed at the Sun - Yes. And the Moon's behind us. Some place behind the Sun. Isn't it?

11 00 39 23 CDR No. No, nobody's behind the Sun to us.

11 00 39 27 CMP Hey, we - You know, we're not shielded - we're not - Gee, I don't know.

11 00 39 44 CMP We may not be in orientation in PTC to be looking at the Sun either. Well, that shouldn't make any difference yet. Were we in PTC when we did it before?

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11 00 39 59 CDR ...

11 00 40 00 CMP Huh?

11 00 40 02 CDR I think so. Because I remember thinking, "How are they going to figure the attitude?" They'd have to get it off the - the data.

11 00 40 11 CMP Yes.

11 00 40 19 CDR Yes, I see. The - the Sun - will soon be behind the Earth, right?

11 00 40 25 CMP Yes, should be.

11 00 40 27 CDR So, if the Sun is close to being behind the Earth right now, maybe the Earth will shield it.

11 00 40 32 CMP Oh, you mean warpage in the pausal tail?

11 00 40 37 CDR Yes.

11 00 40 38 CMP That could be. It comes out in a - in a pinwheel fashion.

11 00 40 56 CMP Although I saw some last night when I went to sleep.

11 00 41 00 CDR Yes, I did, too.

11 00 41 01 LMP Yes.

11 00 41 09 CDR That's good, Jim. Is that an hour? (Laughter)

11 00 41 14 CMP (Laughter) Change the sheet.

11 00 41 15 CDR Wake up, Jim (laughter).

11 00 41 16 CMP (Laughter) ... Houston (laughter). You're ... - -

11 00 41 22 CDR ... - -

11 00 41 23 CMP - - for minutes.

11 00 41 24 CDR All you got to do is repeat that 10 times now, Jim.

11 00 41 36 LMP Boy, that was fast.

11 00 46 04 CDR Maybe we've been desensitized to them.

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[REDACTED]

11 00 46 06 CMP (Laughter)

11 00 46 17 CDR Houston, 15. We're still here. It just looks like a quiet morning.

11 00 46 25 CC Roger. Glad you're still awake. Keep on looking for the cosmic rays.

11 00 46 31 CDR Looking as hard as we can.

11 00 52 23 CDR Absolutely nothing. Very amazing.

11 00 52 28 CMP Yes.

11 00 52 42 CDR MARK CDR. Yes, down on the left eye at about 7 o'clock; intensity about 2. Point source of light.

11 00 52 57 CMP I guess we can get ready then. They're starting to come.

11 01 01 31 LMP MARK LMP. Flash at 8 o'clock on the periphery; intensity 2.

11 01 04 01 CDR MARK CDR. It was in the left eye at 6 o'clock at about a third of the way from the center out; intensity 3; point source of light.

11 01 04 23 CMP You two guys must be shielding me.

11 01 04 26 CDR MARK CDR. It was in the left eye about 2 o'clock; a quarter of the way in; intensity 1; point source. Yes, we're taking it all for you, Al.

11 01 04 41 CMP You must be.

11 01 04 42 LMP I think Dave's imagining all these.

11 01 04 45 CDR Got to do something for the ... - -

11 01 04 46 CMP ... he's gotten to the point where he's conjuring them up on me.

11 01 04 51 CDR Dedicating my imagination to science.

11 01 04 53 CMP Right. Protecting all those who go after you.

[REDACTED]

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11 01 04 59 CDR Wait until you see how many I'm going to see in the last minute (laughter).

11 01 05 04 CMP Confound that curve.

11 01 05 47 CMP MARK CMP.

11 01 05 48 CDR Yay!

11 01 05 49 CMP Left eye; dead center; intensity 2; point source. Only ones I can see are the ones that hit me right between the eyes like a ...

11 01 08 00 CMP MARK CMP. Right eye; about 1 o'clock; 2/3rds of the way out; intensity 2; and a little streaking - some towards the center of the eye - about another third of the way down.

11 01 09 03 LMP Do you have your eyelids closed?

11 01 09 05 CMP MARK CMP. Two flashes: one at 9 o'clock in the left eye and one at 6 o'clock in the left eye; both intensity 3. Yes, my eyes are closed, Jim.

11 01 09 17 LMP Your eyelids are closed.

11 01 09 18 CDR Yes. Me, too.

11 01 09 24 CMP Your eyelids aren't going to stop anything.

11 01 09 27 LMP Don't think so. Just want to get consistent data.

11 01 10 32 LMP MARK LMP. Flash; one at 4 o'clock, halfway out; another one at 2 o'clock on the periphery; intensity 3.

11 01 11 17 CMP MARK CMP. Two o'clock; almost on the periphery; and intensity between 3 and 4. Bright one.

11 01 11 52 CMP MARK CMP. Two o'clock; streak from right to left; centered about the 2 o'clock radial; about halfway out; intensity 2.

11 01 13 51 LMP MARK LMP. It was a streak; right eye; moving from the top down toward the bottom, intensity 4.

11 01 19 50 CDR Maybe we get adapted to it.

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11 01 19 52 CMP Hmm! I suppose so.

11 01 19 55 CDR You build up an immunity.

11 01 19 56 CMP Mm-hmm.

11 01 19 57 CDR Or maybe it's destroyed so many brain cells we don't have any ... left for it.

11 01 20 00 CMP You know, that's right. Maybe that's it. Mmm. Our sensitivity is so dulled - -

11 01 20 05 CDR Yes.

11 01 20 06 CMP - - that we just don't see them anymore.

11 01 20 07 CDR A lot of people would probably agree with that.

11 01 20 09 CMP Yes (laughter).

11 01 20 10 LMP Mmm-hmm.

11 01 20 12 CDR That's why we're doing them to begin with. Because people are worried about that, I guess.

11 01 20 19 LMP Well, I wonder if we're the same distance on the trajectory as we were when we did it on the way out?

11 01 20 24 CDR (Yawn) I don't know.

11 01 20 25 LMP Is that the idea — to be in the same spatial relation? Yes, we could look - -

11 01 20 29 CMP MARK CMP. Right eye; dead center; point source; intensity 3.

11 01 20 38 LMP We could look at the Flight Plan when we get through. The distances are in there.

11 01 20 44 CMP Mm-hmm. Yes. We could always figure it out.

11 01 21 11 LMP MARK LMP. It was a streak; left eye; top to bottom; intensity 2; it was right at the periphery.

11 01 22 03 LMP MARK LMP. Again it was a streak; it was - appeared to be in both eyes; moving from 1 o'clock toward the center; intensity 3.

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11 01 22 27 LMP MARK LMP. A flash; 2 o'clock; periphery; intensity 2.

11 01 23 27 CMP MARK CMP. Right eye; 11 o'clock; about halfway out; point source; intensity 3.

11 01 26 06 CMP MARK CMP. Left eye; about 10 o'clock, 2/3rds of the way out; point source; intensity 3.

11 01 28 49 LMP MARK LMP. Flash; position 2 on the periphery; right eye; intensity 2.

11 01 28 58 LMP MARK LMP. Same position; intensity 4; flash.

TIME SKIP

11 03 14 09 CC Roger.

11 03 14 11 CDR And on top of A-2, we have the ISA decontam bag, for 64 pounds.

11 03 14 23 CC We copy.

11 03 14 25 CDR Okay. A-3, A-4, A-5, and A-6 - as you have on your list right now.

11 03 14 34 CC We copy.

11 03 14 36 CDR A-7 is as you have on your list, with an addition of the LM DAC and the LM 70-millimeter camera that failed on the surface, which we thought you might like to take a look at it.

11 03 14 51 CC All right, both those are - are added items, I take it?

11 03 14 54 CDR That's correct.

11 03 15 04 CC We copy.

11 03 15 06 CDR Inside of A-7 is the EVA umbilical and bag as p - p - prescribed.

11 03 15 14 CC Roger.

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11 03 15 15 CDR Top of A-7 is sample collection bag - Oh, stand by. Oh, shoot, we didn't scratch this out. Dad gum it.

11 03 15 25 LMP What's that?

11 03 15 27 CDR You don't - On top of A-1, we don't have number 2. We moved it over here to top of A-7. We've got the LM items, right? Only. Just the LM items on top of the - -

11 03 15 35 LMP Yes.

11 03 15 36 CDR - - of - of A-1? That's right. 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 A-1, and scratch "Sample collection bag number 2."

11 03 15 53 CC Okay.

11 03 15 55 CDR And then go back to your right-hand column there. On top of A-7, we have a - a decontam bag with sample collection bag number 2 and the BSLSS bag, for a total of 48 pounds.

11 03 16 16 CC We copy.

11 03 16 19 CDR Okay. The 35-millimeter bracket in the bag, we're going to put that in the - -

11 03 16 24 CC - - I clarify that - both of those bags - -

11 03 16 26 LMP That's going to go in there.

11 03 16 27 CC - - together were 48 pounds, or do I also put over the 20 - the 23 pounds we had on A-1?

11 03 16 33 CDR No, the total of collection bag number 2 plus the BSLSS is 48 pounds.

11 03 16 41 CC I understand.

11 03 16 43 CDR And you can scratch the collection bag number 2 for 23 off of A-1.

11 03 16 50 CC Roger.

11 03 16 57 CDR Okay. And then, in A-8, it's stowed as pre - -

CONFIDENTIAL
TIME SKIP
CONFIDENTIAL

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11 03 25 44 LMP -- to have some wet packs. I think I'll finish what I have, and then I still - Yes, I'll hit the wet packs.

11 03 25 49 CDR You got 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 wet packs. Hey, we're in - -

11 03 25 59 CMP That's enough to keep us alive.

11 03 26 01 CDR Oh, yes.

11 03 26 02 CMP Do we have - How many deals do we have to mark? Two?

11 03 26 05 CDR Just two. Let me stick that in there, too.

11 03 26 08 CMP Great. I think, just to clean this place out a little bit, I'm going to take some of these bacon squares and throw them.

11 03 26 23 CDR Yes (laughter). It's probably a good idea.

11 03 26 46 CMP As a matter of fact, we could consolidate a lot of this stuff.

11 03 26 48 CDR Yes.

11 03 26 50 CMP We could use these bags for garbage bags.

11 03 26 53 CDR Yes.

11 03 27 00 LMP You dropped yours.

11 03 27 06 CDR God damn! Dropped it on the floor. Lord a'mighty.

11 03 27 32 CDR Get what you want?

11 03 27 35 CMP Yes.

11 03 27 41 LMP Oh, a little spaghetti. I had some for breakfast; it wasn't bad. A vast spectrum.

11 03 27 54 CDR Two meals tomorrow, breakfast, and two more meals today - -

11 03 28 05 LMP One - two - Uh-oh, we'll have to eat - to eat fast, to eat it all up.

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[REDACTED]

11 03 28 13 CMP No, I don't think so (laughter). I think we're going to be there.

11 03 28 17 CDR Do you guys think - -

11 03 28 18 CMP We've got 10 wet packs.

11 03 28 19 CDR Ten wet packs, huh?

11 03 28 22 CMP Yes, one for lunch, one for dinner, and - one for tomorrow.

11 03 28 50 CDR Want a wet pack, Jimmy?

11 03 28 52 LMP Yes, I'll probably take one as long as you got them out.

11 03 28 54 CDR Anybody tried the beef stew?

11 03 28 55 LMP Yes, I have a beef stew here.

11 03 28 57 CDR Mine was pretty good.

11 03 28 58 CDR I'll try one.

11 03 28 59 CDR You want to try one?

11 03 29 00 CMP Yes.

11 03 29 03 CDR Pretty interesting.

11 03 29 06 CMP Have a wet pack.

11 03 29 10 CDR Okay.

11 03 29 14 CMP ... get the drinks out here.

11 03 29 18 CDR And right now you got a P52.

11 03 29 21 CMP Oh, really.

11 03 29 22 CDR Just to stir you up a little bit.

11 03 29 25 CMP Okay. Here's the beverage.

11 03 29 27 LMP Okay. What kind of beverage do you want here, Dave?

[REDACTED]

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11 03 29 33 CDR I can't take anything but water, grape, and cocoa. I'm through with that other stuff. Somebody ought to - -

11 03 29 37 LMP There's one grape left.

11 03 29 38 CDR Well, you can have it.

11 03 29 39 LMP Getting lucky.

11 03 29 40 CDR I don't care. I'll just drink water.

11 03 29 41 LMP Oh, I - I'd like the grape, too.

11 03 29 43 CDR I can't take any more. I've had 21 days of those juices, and that's all I can handle.

11 03 29 51 LMP Yes. I'm with you, pal. I feel that way about a lot of this stuff. Well, what do you want to drink, Al? Did you get your drink?

11 03 29 59 CMP No, not yet.

11 03 30 00 LMP Do you want an orange?

11 03 30 02 CMP Yes, I don't guess there's any pineapple left, is there?

11 03 30 05 LMP There's a pineapple-orange.

11 03 30 07 CDR Is there a pineapple-orange in there?

11 03 30 08 LMP Yes.

11 03 30 09 CMP Yes, that's what I'd like.

11 03 30 17 LMP No, I take that back. There's an orange-grapefruit. There's no - no pineapple. What's your choice?

11 03 30 24 CMP Oh, I'll have an orange.

11 03 30 25 LMP Okay.

11 03 30 48 CDR Is that P52 due now?

11 03 30 50 CMP Yes.

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11 03 30 51 CDR Okay. Jim, put these back.

TIME SKIP

11 04 13 49 CC Apollo 15, this is Houston. We'd like to have you retract the mass spectrometer boom for 85 seconds.

11 04 13 58 CMP Understand. Retract the mass spec boom for 85 seconds.

11 04 14 08 LMP Yes, I will. Soon as I get the door closed here.

11 04 14 10 CMP Roger. Get you ... then.

11 04 14 12 CC That's affirm, and then you'll leave it there for about 5 minutes. We'll cue you when to extend it again.

11 04 14 17 CMP Okay.

11 04 14 19 LMP Okay, retracting now.

11 04 15 47 LMP ...

11 04 15 50 CDR Huh?

11 04 15 52 LMP Screwed up.

11 04 16 36 CMP Your stuff.

11 04 17 07 LMP This the way it goes in?

11 04 17 08 CDR Yes, it's getting a little tricky. Ought to get that thing in there, though.

11 04 17 12 LMP Does it go in all the way?

11 04 17 13 CDR Yes, put it in.

11 04 17 16 CMP Yes.

11 04 17 22 CDR ...

11 04 17 28 LMP That's funny. Looks like it fits in there pretty well. Oh, what's in - Okay. You're going to put the camera on anyway.

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11 04 18 11 CDR Got ... we can start.

11 04 18 13 LMP Yes.

11 04 18 15 CDR Okay.

11 04 18 17 CMP Okay, we're starting. NOUN 35. Starting now.

11 04 18 50 CDR Guess we might as well maneuver, huh?

11 04 18 54 LMP I don't know. Why do you want to go early?

11 04 18 57 CDR Why not? There's nothing in - the Flight Plan ... Nothing in here ... that I can see.

11 04 19 08 LMP Well, how about - explain this.

11 04 19 12 CDR Gamma ray gain. Got to be there by - -

11 04 19 17 LMP Not until 50 - 30 minutes from now.

11 04 19 37 CDR Yes, that's right.

11 04 20 04 LMP I guess we're going to dim the lights and do all this on time. Rather sit for - we can get a flash-light out.

11 04 20 14 CDR ...

11 04 20 18 LMP Well, we'll see. One minute. Let's see. I don't know why - cabin lights are not going to affect it anyway with that cover over it.

11 04 20 28 CDR ...

11 04 20 40 LMP Says we're supposed to use the PCM cable. How can we shoot - that PCM cable for the 250? The EL? It won't reach this window, will it? And we'll have the Nikon in the other window.

11 04 20 55 CDR Didn't we have that this morning?

11 04 20 57 LMP Well, it's ruined the other things, Dave. That's for the sextant photos.

11 04 21 22 SC (Sneeze)

11 04 21 36 LMP Solid 24 minutes of activity, isn't it?

[REDACTED]

11 04 21 59 LMP We got MAG N on there. And I still have a MAG way back here with a - color - Q. They suggested T, but -

11 04 22 24 SC (Yawn)

11 04 22 26 CDR ... Q ...

11 04 22 28 LMP Might as well.

11 04 22 56 CDR ...

11 04 23 04 LMP I'll look in this TSB over here.

11 04 23 06 CMP Look in - in U-1 back there.

11 04 23 58 LMP ...

11 04 24 00 CMP Roger. You messed up 190 ... - -

11 04 24 02 CC 15, this is Houston. Would you please extend the mass spec boom all the way out again?

11 04 24 08 CDR Tell him yes.

11 04 24 09 CMP Roger. In work.

11 04 24 13 CC And I have a T-start for the lunar eclipse photos when you're ready to copy.

11 04 24 19 CMP Okay. Go ahead with T-start?

11 04 24 32 CC T-start for lunar eclipse photos, 268:59:47.

11 04 24 42 CMP Understand 268:59:47.

11 04 24 48 CC That's correct, Al.

11 04 24 53 LMP Yes, my camera's still up here, Dave.

11 04 24 55 CDR Okay, good.

11 04 25 00 CMP Hey, we're going to have to rush.

11 04 25 01 CDR Huh? I know it. Why - logical.

11 04 25 04 CMP Okay, 59, 47, ...

[REDACTED]

~~CONFIDENTIAL~~

11 04 25 07 CDR How long is that from now?

11 04 25 10 CMP Three minutes.

11 04 25 11 LMP Well, why don't we go ahead to U - Why don't you go - -

11 04 25 13 CC Al, we had a question on the mass spectrometer, and it may be too late. Was it possible to confirm by visual look through the window that it was retracted?

11 04 25 25 CMP Negative, Karl. You can't determine that it's retracted. All you can determine is that it's full out.

11 04 25 33 CC Roger. 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 into view?

11 04 25 44 CMP You want - -

11 04 25 45 CDR Okay, he wants you to watch and see if it does come full out.

11 04 25 48 CMP Roger. In other words, you're asking to confirm that it does come full out.

11 04 25 54 CDR All right, - -

11 04 25 55 CC That's correct.

11 04 25 56 CDR - - look down - -

11 04 25 57 CMP Okay.

11 04 25 58 CDR - - and if you can't see it, it was retracted. If you can see - You can't see it then.

11 04 26 02 LMP Yes.

11 04 26 06 CDR ...

11 04 26 08 CMP Sure I can. Okay, Jim, I'll go ahead maneuver you. You're the act again.

~~CONFIDENTIAL~~

[REDACTED]

11 04 26 17 LMP Okay.

11 04 26 19 CDR Let's see a Flight Plan.

11 04 26 53 LMP Well, if we can't find that other MAG, Al, we might have to use this one. Got the one MAG here of black and white from the LM. It has got to be - -

11 04 27 02 CC Just to clarify - -

11 04 27 03 LMP - - very high speed.

11 04 27 04 CC - - our question, Al, the main question was just to confirm whether or not it did go out of your field of view. Did it actually move from full - from the full-extended position? Al, since you saw no change in the data when you 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.

11 04 27 25 CMP Understand.

11 04 27 26 LMP I see - there's one boom extended.

11 04 27 30 CMP Okay. It's fully extended now, Karl. But it may be too late. It may have already been out by the time we looked. Is that talkback barber pole or gray?

11 04 27 40 LMP Gray.

11 04 27 41 CMP Yes.

11 04 27 50 CDR It kind of oscillates back and forth, doesn't it?

11 04 28 08 CMP Karl doesn't realize we don't want to get too much UV. He must think we watch out that window every time we extend and retract it.

11 04 28 20 LMP Hmm.

11 04 28 21 CDR Yes, no kidding.

TIME SKIP

[REDACTED]

11 06 08 35 CMP Percentage on the MAG?

11 06 08 39 LMP Okay.

11 06 08 40 CDR Trim and call it 75.

11 06 08 44 LMP Okay, we're moving. Stable DAC. G&N POWER coming back to AC 1. CMC MODE, AUTO, Dave? A VERB 49 maneuver to the lunar-eclipse attitude. I wonder - I guess we better be in that attitude - for the press conference. Okay. You ready -

11 06 09 10 CC 15, Houston. We'd like to get the HIGH GAIN up, PITCH, 22; YAW, 261.

11 06 09 17 LMP Say, buddy!

11 06 09 21 CMP Stand by; we're maneuvering.

11 06 09 25 CDR The numbers, Jim.

11 06 09 26 LMP Okay; 040, plus 011, plus 041.

11 06 09 42 CDR Forty, 11, and 41. Right?

11 06 09 44 LMP That's right.

11 06 09 54 CDR What time's the chronometer say?

11 06 09 55 LMP Twenty after.

11 06 09 58 CMP Yes.

11 06 10 03 CDR Okay, Houston. Are your high gain angles for the sextant photos or for the lunar-eclipse-photo attitude?

11 06 10 14 CC Sorry about that, Dave. When you complete this maneuver, they're in your Flight Plan, PITCH, minus 22; YAW, 227.

11 06 10 21 CDR Roger.

11 06 12 03 CDR Oh, yes. That's not bad. Not a bad picture. Oops!

11 06 12 18 CC 15, we'd like to have OMNI Bravo.

11 06 12 23 CDR Can you get that for him, Jim? OMNI Bravo?

11 06 12 26 LMP Oh.

11 06 12 27 CMP I'll get it. - -

11 06 12 28 LMP OMNI Bravo.

11 06 12 29 CMP ... Okay.

11 06 12 40 CDR It's looking up.

11 06 12 46 CMP Let's see - -

11 06 12 47 CDR Wait.

11 06 12 49 CMP Yes, let me get it.

11 06 12 53 CDR What say to open all the windows and get a little light in here, huh?

11 06 12 58 CMP Yes.

11 06 13 09 CDR There seem to be - Ah, there won't be any at the lunar-eclipse attitude, though.

11 06 13 32 LMP Turn all the floods up all the way.

11 06 13 34 CDR Yes.

11 06 13 52 CMP What time's ...?

11 06 13 54 CDR In a few minutes.

11 06 13 59 LMP Yes, at 20 after.

11 06 14 00 CDR Yes.

11 06 14 11 CDR One guy here.

11 06 14 13 LMP Let's see if this controller wants to take up.

11 06 14 17 CDR One guy here. Here, I got it, Jim. Why don't you come on down?

11 06 14 25 LMP Come down now?

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11 06 14 26 CMP Yes. Sit on my urine hose. Keep the - -

11 06 14 28 CDR Sit on urine hose and keep it down. The controller, we can stick under the couch - for now. This moose is in the way.

11 06 14 47 CMP (Laughter) Too much gravity.

11 06 14 50 CDR Get over in the - put your feet on the couch and sit down.

11 06 14 53 CMP Well, someone's going to have to get up and get the switch.

11 06 14 54 CDR What switch?

11 06 14 55 CMP SCIENCE - -

11 06 14 56 CDR I'll get it.

11 06 14 57 CMP - - TV switch.

11 06 14 58 CDR Yes, it's got to go TRANSMIT on the TV.

11 06 15 00 CMP Yes.

11 06 15 02 CDR Let's see if this all is going to work. No, we've got to shift it over - away from the corner. Yes, okay. Hold on to that.

11 06 15 27 LMP Okay, it looks like we're in attitude. Al?

11 06 15 30 CMP Right.

11 06 15 31 LMP And we got to get the high gain going there.

11 06 15 33 CDR Okay. It's not in the press con - shoo - it's not in here.

11 06 15 45 CMP It's in there for the - the maneuver to the - yes, the eclipse attitude.

11 06 16 00 CDR Let's see, you ought to try and move those hoses somewhere, Jim. Because you're going to end up having to be further back in the corner, I think. This thing needs to come - Great. I don't - Why don't you come - You get down - -

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[REDACTED]

11 06 16 18 LMP What's wrong?

11 06 16 20 CDR Taped right now, but I think - -

11 06 16 21 CMP Yes.

11 06 16 22 CDR Yes, it needs to come over this way more. It's not going to go any further on the other side of the bulkhead there.

11 06 16 35 LMP Yes.

11 06 16 36 CDR See, because I'm - I'm in the far - no. Jim, can you get down? And let's see how it's going to work.

11 06 16 40 CC 15, Houston. Give us AUTO and NARROW on the HIGH GAIN, please.

11 06 16 44 CDR Whew!

11 06 16 45 LMP Roger. AUTO and NARROW.

11 06 16 46 CMP You want the front end to come this way a little? You want the front end to come this way?

11 06 16 56 CDR No, I guess it's all right, if I can - It - it - There.

11 06 20 00 CDR It's reflected. I mean there's not -

11 06 20 01 CMP Yes, that's what I made it for. Pick up behind here. No, right behind here.

11 06 20 08 CDR Tell you one thing. I hope we can turn the lights up.

11 06 20 10 CMP Yes. Might help.

11 06 20 12 CDR Lights all up?

11 06 20 13 CMP Yes. Oh, put it up it.

11 06 20 18 CDR Al, you take that little bit and we'll put it on the patch.

11 06 20 21 CMP Okay.

[REDACTED]

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11 06 20 22 CDR Okay. Yes, that's fine. How's that?

11 06 20 26 CMP You got it, Jim. Fix it (laughter).

11 06 20 33 CDR You see a patch, Al?

11 06 20 34 CMP Yes.

11 06 20 35 CDR Okay.

11 06 20 37 LMP Okay, there you go.

11 06 20 38 CMP No, I don't want it.

11 06 20 39 LMP See there? It's going to be hitting it. By gads, I'll just hold it on the patch.

11 06 20 54 CMP (Laughter) Maybe.

11 06 20 58 LMP I'm in charge of light - light - light effect there - -

11 06 21 00 CMP Light, yes.

11 06 21 01 LMP - - on the patch.

11 06 21 02 CMP Light my own.

11 06 21 04 LMP You want me to turn it on at the right time, Bob?

11 06 21 06 CMP (Laughter)

11 06 21 07 LMP Huh?

11 06 21 08 CMP (Laughter)

11 06 21 09 CDR No, I think that's all right. There. Maybe you ought to come over this way a little bit. You're up there, like you're hiding in a corner.

11 06 21 20 LMP There you go.

11 06 21 21 CDR There. No, I don't think you need that on the patch, do you?

11 06 21 24 CMP No.

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11 06 21 26 CDR You still got to look at the stupid camera.

11 06 21 27 CMP No, it doesn't - shows my face up there.

11 06 21 31 LMP What do you mean?

11 06 21 32 CDR Okay.

11 06 21 34 CMP We'll keep it available in case somebody wants to look at my face (laughter).

11 06 21 39 CDR Okay. Houston; 15. You ready down there?

11 06 21 50 LMP Well, it's in TV already. Who put it in TV?

11 06 21 53 CC Roger, 15 - -

11 06 21 54 CMP I put it in TV.

11 06 21 55 CC - - We're close to ready. Are you ready for a big press conference?

11 06 21 57 CMP That goes TRANSMIT.

11 06 21 58 CDR Oh, Roger. We're ready. Any time you want to go to TRANSMIT, let us know.

11 06 22 06 CC Okay, you can go ahead to TRANSMIT.

11 06 22 09 CDR Roger. We are. I got 3 seconds, 2 seconds, 1 second. How's that? There.

11 06 22 19 CMP Except for - move your wire, Jim.

11 06 22 22 CDR That a boy, now. See? They get it all. Okay, Houston, talk to us. We're all here. Except how does it - -

11 06 22 32 CC Hey, 15, we're getting a beautiful picture coming through.

11 06 22 34 CDR Yes.

11 06 22 36 CMP Very good.

11 06 22 37 CDR Roger. Go ahead with your questions.

11 06 22 45 CDR It's probably blank as hell.

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11 06 22 46 CC Roger. We'll - we'll admire the beautiful picture for - for a few minutes here.

11 06 22 50 CDR ... this one.

11 06 22 51 CMP ... lens?

11 06 22 54 CDR Yes, that's been done.

11 06 22 56 CC Deke just passed out from the shock, incidentally.

11 06 23 01 LMP Do we look that scroungy? (Laughter)

11 06 23 03 CDR Yes - yes. No, we look so good.

11 06 23 05 SC (Laughter)

11 06 23 07 CMP Mmm!

11 06 23 08 CDR He probably can't believe it.

11 06 23 09 CMP Yes.

11 06 23 12 LMP It's just because we haven't shaved in 2 weeks.

11 06 23 14 CMP Is that a fact?

11 06 23 15 LMP Yes.

11 06 23 16 CC Okay, fellows, 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've been covering the flight. Some of the questions they raised have been answered in your communications with - with Mission Control, but the public at large has not necessarily heard them. The questions are being read to you exactly as submitted by the newsmen and in an order of priority specified by them.

11 06 23 45 CDR Hum.

11 06 23 46 CC Question number 1. Since 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?

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11 06 24 03 CDR

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Well, I guess we all probably have a different idea on 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 IM 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?

11 06 24 39 CMP

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.

11 06 25 11 LMP

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 - a few years of waiting and training. And then, as far as the event that I would not like to - to repeat again, was probably the - the time when I fell down in front of the TV when we were deploying the Rover.

11 06 25 42 CDR

Let me get your mike.

11 06 25 45 CC

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.

11 06 25 58 CDR

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 sitting on top of a - a dark brown larger fragment, almost like on a pedestal. And Jim and I were both quite impressed with the fact that it - 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 this one rock, if it is, in fact, the

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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.

11 06 26 48 CC

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?

11 06 27 02 CDR

Jim? Why don't you answer that?

11 06 27 05 LMP

Well, I guess that, immediately, I think of the - 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. And 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 in - on a large mountain on the Moon.

11 06 27 45 CC

Question number 4. This is the toughest landing area we have attempted to - to reach on the Moon. Describe what it was like, flying into it.

11 06 27 58 CDR

Well, I think, to begin with, we had every confidence that we could get to the landing site. The trajectory had been modified such 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 pitch - pitched over and saw the - the plain at Hadley, and that was probably as impressive sight - a sight as I've seen. The landing itself, once we pitched over, was somewhat of a surprise in that the - the cratering was much more subtle than we had expected. There was a great lack of any large fragments or boulders on the surface. It was apparently quite smooth, and those rather deep craters, which we - 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

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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 in the Rover. And I think that having a vehicle such as that - 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 our mobility and land anywhere within a certain prescribed area, which was initially our goal on this flight.

11 06 29 39 CC

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?

11 06 29 54 CMP

Yes. The comment on the cinder cones was one of color, but we noticed particularly on - on some of the lighter part of the back side that many, many of the craters that we - that we flew over were filled with what appeared to be lava. There seemed to be a great number of lava flows in the - in the mare area, particularly Mare Imbrium. Mare Imbrium seems to be a - just a - countless numbers of - of lava flows, which were all apparently very thin and - and very fluid. And you can see - you can just count number - numbers of flow fronts covering Mare Imbrium. So we got, I think, quite a distinct impression of a - of a - 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 - and certainly a lot of lava flows.

11 06 31 06 CC

Question number 6. Do you feel that the workload 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?

11 06 31 23 CDR

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 - I think we came back and I don't think

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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 have 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 geology field trips and in simulations at the Cape in our suits, we feel, was a factor which really contributed to being able to proceed with those duration EVAs. I see no problem in the future with conducting three successive 7-hour EVAs. Neither one of us were particularly physically tired. I think the fatigue is really in the - 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 - and keep your eyes open to make the appropriate observations and gather the samples. And I think it's really more of a mental factor than a physical factor.

11 06 32 50 CC

Question number 7. You described the Lunar Rover as a bucking bronco on the Moon. Would you elaborate and assess the Rover's performance and tell us what changes you recommend for the 1972 model?

11 06 33 04 CDR

(Laughter) Jim, you want to talk about that? Why don't you go ahead? Not too hard, though (laughter).

11 06 33 12 LMP

Well, there were several times there when we were riding along where we'd hit a - a sizable bump and you could - you could see the - the wheels come off the ground and then float through the air and - But Dave should comment more as far as the - 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 seatbelt, but I - I really did feel like I was on a - a bucking bronco.

11 06 33 41 CDR

I think I might add that it's a - it's a very stable machine, but because of the - the 1/6th gravity, it tends to float. In - in the simulations we ran in Houston, we saw the same amplitude or the same degree of bouncing but a different damping. In other words, the - the vehicle would

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come off the ground, or one wheel normally would come off the ground, and it would take it somewhat longer to return to the ground than in one g. And I think it's just a matter of being - becoming accustomed to the - to driving. It's a very stable vehicle; the suspension system - system is excellent. We had to make some rather sharp avoidance turns periodically, and in - 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 a seatbelt-type arrangement, and we - we've discussed that also. I think we have some suggestions we could make when we get back to ensure 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.

11 06 35 02 CC

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?

11 06 35 13 CDR

I guess I'd anticipated that question. I think the problem was a - 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 - 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 - 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 of the Moon of basic bedrock or foundation rock on the Hadley Plain. I think that's a very significant find. I think it will be very meaningful to the scientists when they analyze it. The perplexing problem was doing 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 at the end, it took both Jim and I with our shoulders, pushing as hard as we could, up, to extract the drill stem. But, in the final analysis, as I look back on it, I think it is indeed worthwhile. At

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the - at the time it occurred, we were both interested in moving out to the - the Northern Complex and further geology, which Jim and I are both quite interested in. And the mechanical task of doing the drill at that time seemed what - somewhat less important than seeking new - 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.

- 11 06 37 15 CC Question number 9 for Dave Scott.
- 11 06 37 17 CDR Gee, I don't want them all.
- 11 06 37 18 CC In view of your comment to geologist Leon Silver about the need for trained scientists 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?
- 11 06 37 32 CDR Okay. Well, since I really had very little say-so as to which - which people get selected for which crews, I might sort of bypass it with the - with the one comment that I think the more qualified a man is on the Moon, the more results you're going to get. And I think that's one of the reasons that we put as much time as we did into the geological aspects, in hopes of - of learning enough to bring back some significant data. I think that, in any situation such as this, in any scientific endeavor, that you want the most qualified people possible. You must also remember that this is a - a highly complex operational mission. It requires a great deal of - of training and skill in order to fly these machines. I think, in particular, Jack Schmitt - Schmitt is a very highly qualified individual in both aspects. And I believe it's up to the - the management, that when they select the crews, to select the best people for the flight. That all right?
- 11 06 38 42 CC - - Al Worden. What runs through the mind of a man orbiting the Moon alone?
- 11 06 38 51 CMP Well, I guess - I guess the - 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,

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and how I was going to keep track of all the experiments we had going and where they were, and - 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 - I guess I didn't really have - have much time to give any thoughts to being alone out there.

11 06 39 31 CC

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?

11 06 39 45 CMP

Well, let me answer the last one first. I - 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. Now as - as far as what I felt like when I went out there, we talked a little bit about it after - after the EVA and decided it was sort of like walking on stage at 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 beating down on everything, and it looked like a very large floodlight on a stage. And then putting the TV camera out on the door 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 - we did it just almost exactly as we'd practiced it. It took almost exactly the same amount of time; we did it the same way. And, of course, we had practiced out with the pan - with the mapping camera in the extended position, and so that - that really posed no difficulty to us.

11 06 40 55 CC

Question number 12 for Dave and Jim. You - 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?

11 06 41 12 LMP

Why don't you?

[REDACTED]

- 11 06 41 13 CDR Well, I'll start out and - 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 - 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. So the Northern Complex was, in fact, an addition to the original requirement; 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 - a bonus had we been able to reach that point. And, with that in mind, I hope that someday somebody gets a chance to go back and take a look at the Northern Complex. Jim, you want to answer?
- 11 06 42 18 LMP No, I agree with everything you said. It was just a - a little personal disappointment that we couldn't get up there, because we - we thought we'd have another beautiful view of the - the plains there and the LM, a view almost - -
- 11 06 42 29 SC (Sneeze)
- 11 06 42 30 LMP - - as beautiful as it - as it was from the side of Hadley Delta.
- 11 06 42 37 CC 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?
- 11 06 42 48 CDR (Laughter) Well, I think - the magnitude of the scientific data we've returned 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've gathered in the SIM bay and in the lunar samples we have aboard right now. I think these data will not only en - enhance the progress of science, but it'll reach the common man on the street

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directly by the - the byproducts of what we learn. I think man must extend himself, that new frontiers must be opened in order for us to - to propagate mankind, and I think this is one way in which we do it. I - 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 - the film magazines that Al brought in yesterday from those cameras, why, you'd see that we have indeed at - at least a great deal of data on film alone. Want to answer that?

11 06 43 59 CMP

Well, I really guess that - that there's not much more to add to what Dave said. He - he expressed my sentiments exactly, in that the - the knowledge that, hopefully, we've - we've added to our store of information about the Moon and about ourselves will be increased in an extent which is greater than - than the - than the capital that was - spent on the flight itself. And I would certainly think that - that this whole theory adds significantly to - to man's knowledge about himself primarily and about himself in those areas where it will help future generations maybe. Jim?

11 06 44 45 LMP

I can only add that we're bringing back just a - a lot of - a lot of data and a log of material, and it's going to take many years for people to really appreciate how much was gained from - from this flight.

11 06 45 05 CC

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 VIII?

11 06 45 22 CDR

Well, I guess we weren't aware we had that many problems. I thought this was a rather troublefree 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 it with Gemini VIII at all. We had a - I guess the first little problem we had was a - a leak in our water system, which was cleared up rather rapidly by somebody having already done

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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 - I guess really I couldn't ask for much more. How about you?

11 06 46 37 CMP Well, I really don't - -

11 06 46 38 CDR No, go ahead.

11 06 46 39 LMP Go ahead. You know, really, we had very few problems. It seemed like a very tame simulation, as far as I was concerned.

11 06 46 47 CMP Certainly, there were - there were - 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. But certainly none of the important aspects of the flight or - or none of the essential pieces of equipment has malfunctioned, and I think it's been just great. Okay, Karl, you take it from there, baby.

11 06 47 19 CC Gentlemen, we'd like to continue the press conference in a few minutes. But, in the meantime, we'd be anxious to get - start - get one of you started on the lunar-eclipse photos.

11 06 47 28 LMP Yes, turn - -

11 06 47 29 CDR We got to try to do both?

11 06 47 30 CC - - three more questions.

11 06 47 31 CDR Okay - -

11 06 47 32 CC Question 15.

11 06 47 35 LMP Why don't we show them the lunar eclipse?

11 06 47 37 CDR (Laughter)

11 06 47 39 LMP There's a lunar rock to show them.

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11 06 47 40 CC - - 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?

11 06 47 54 CDR Let's think, how many times?

11 06 47 56 LMP Well, I fell down twice - -

11 06 47 57 CDR Yes.

11 06 47 58 LMP - - and it was never any real problem. Actually, I could have got up very well by myself without any help.

11 06 48 05 CDR Yes, I guess I fell down twice, too, and, as - as Jim said, it was never any really problem. It's a matter of, if you start to go - and, of course, the terrain there, I guess you could see in 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 - a light fall. Because of the 1/6th 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 slowing you up for a minute, enabling you to regain your balance, and go ahead. And - and I have a question. Do you want to have the photos of lunar eclipse with the television now, or do you want us to get on with the - the camera photos? Because if that's the case, we have to turn the lights out.

11 06 49 13 CC Roger. 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.

11 06 49 28 CMP Oh, man.

11 06 49 29 LMP (Laughter) Ohh!

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11 06 49 30 CDR Okay. I guess - -

11 06 49 31 CMP (Laughter)

11 06 49 32 CDR - - to show you around, we have to unstow everything. We're - we're pretty well stowed for re-entry 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 some - somewhat impractical, in that all you could see would be some - some edges of the white bags, and that's why we have the room in the cabin here. Every - 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.

11 06 50 12 CC O - okay, Dave. That's fine. And I guess one last request is, when you get over to that window to - and before you take the photos, could you give us a quick picture of the Moon with the TV camera?

11 06 50 23 CDR Sure will. Can try it.

11 06 50 31 CMP (Humming)

11 06 50 37 CDR Have I got any pictures? I'll cut this thing down.

11 06 50 40 CMP (Humming)

11 06 50 42 CDR See any magazines?

11 06 50 43 CMP Yes - -

11 06 50 44 LMP Right here's some, Dave. I got Al's. You got some? Procedures, cameras -

11 06 50 55 CMP You ought to get over here.

11 06 50 56 CDR Let me get over there.

11 06 50 57 CC 15, the word here is to proceed. Give your photography first priority there, and maybe we can see the - the Moon out of the other window.

11 06 51 09 CMP That's ... - -

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11 06 51 10 CDR Okay, we're working on it.

11 06 51 14 CMP Oh, ...

11 06 51 17 LMP Got enough?

11 06 51 27 LMP Hold it, Al. It's still going - -

11 06 51 29 CDR Monitor? Yes, I can get it from here. I think.

11 06 51 56 CC 15, Houston. We hear that your attitude is very good right now; there's no need to trim the maneuver.

11 06 52 02 CDR Okay, thank you.

11 06 52 05 LMP Okay, Al, you got the camera all set up over there, huh?

11 06 52 08 CMP Yes.

11 06 52 09 LMP Do you want me to read the settings to you, just in case?

11 06 52 10 CMP Yes.

11 06 52 11 LMP There's a change.

11 06 52 12 CMP Yes.

11 06 52 14 CDR If you'll grab those ...

11 06 52 18 LMP What do you want me to get, Dave? Get the lights? Yes, I can get them.

11 06 52 24 CMP If you can get the lights -

11 06 52 38 LMP Turn this up a little bit. Okay, Al, when you're ready for me, I'll read to you.

11 06 52 50 CDR Could that be it?

11 06 52 53 CMP Need anything down there, Dave?

11 06 52 55 CDR No, I don't think so. See what it looks like.

11 06 53 01 LMP Well, it's completely dark now. Just the lower part is orange.

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11 06 53 04 CDR Yes.

11 06 53 07 LMP The top part's almost a red, a dark red, and the bottom is an orange.

11 06 53 11 CMP Here.

11 06 53 12 CDR There you go. Yes, you got her. Okay, Houston. I think you have a picture of her now. There she is.

11 06 53 19 CMP Okay.

11 06 53 20 LMP Okay. Let's check it; f/1.2?

11 06 53 23 CMP Yes.

11 06 53 24 LMP 1/500th?

11 06 53 25 CMP Right.

11 06 53 26 LMP Take eight frames? Okay, I guess we'll give priority to you, huh, Al?

11 06 53 30 CDR Okay, we - we got to get the - -

11 06 53 32 CC 15, so far we have a blank screen down here.

11 06 53 35 CDR Oh, really? I've got a good picture on the monitor.

11 06 53 41 CMP Okay, Jim, while - -

11 06 53 42 CC Hang on for a moment, please.

11 06 53 43 LMP Okay, we're coming up on 6 minutes here at 55 - -

11 06 53 47 CMP Besides, we're FREE here.

11 06 53 49 CDR Boy, every time those - the jet fires ...

11 06 53 52 LMP Okay, go - we're FREE.

11 06 53 54 CMP Okay, Jim.

11 06 53 56 CC It's coming through now.

11 06 53 57 CMP Okay, Jim.

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11 06 53 58 LMP Okay, stand by. Your first one'll be a 60-second exposure time and I'll - it'll be at 55:53.

11 06 54 07 CMP Well, that's kind of - not ...

11 06 54 08 CC That's a beautiful picture with just an edge of the Moon coming out of eclipse.

11 06 54 11 CMP I can do it anyhow.

11 06 54 12 LMP Can you?

11 06 54 13 CMP Roger; that's right.

11 06 54 17 LMP Okay. Suit yourself then. I'm - -

TIME SKIP

11 11 07 09 CDR Anybody else like chicken stew?

11 11 07 14 LMP Chicken stew, huh? Yes, I do. I didn't know we had any. Is that what you have up there?

11 11 07 31 CMP Yes.

11 11 07 32 CDR No, uh-uh.

11 11 07 44 LMP If you want to eat here, I'll be happy to come down there.

11 11 08 31 LMP Hey, throw me some beef steak. Well, I guess some turkey and gravy.

11 11 08 50 CDR ...

11 11 08 52 LMP Go back where? Yes, man, you aren't kidding.

11 11 08 58 CMP Thought you wanted to go back to the Moon?

11 11 08 59 LMP Don't know why.

11 11 09 26 LMP I'll trade with you, Dave.

11 11 09 27 CDR All right.

11 11 09 28 LMP I'll go down there.

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11 11 09 31 CDR Down here?

11 11 09 32 LMP Yes.

11 11 10 37 LMP This is our new garbage can down here, huh? Good.

11 11 10 49 LMP You want to get those readings now, Al, or after supper?

11 11 10 52 CMP I don't care.

11 11 10 54 LMP Get them now?

11 11 11 03 CMP Okay. Start out with 5-C.

11 11 11 13 LMP 5-C reading 4 - 4.2.

11 11 11 19 CMP All right; 5-D?

11 11 11 23 LMP 3.9.

11 11 11 25 CMP 6-A?

11 11 11 26 LMP You writing them down?

11 11 11 28 CMP Yes.

11 11 11 30 LMP 6-A is 4.1.

11 11 11 34 CMP Okay; 6-B?

11 11 11 37 LMP 4.2.

11 11 11 42 CMP 6-C?

11 11 11 45 LMP Greater than 5.

11 11 11 48 CMP No kidding. Huh. Okay - -

11 11 11 53 CC ...

11 11 11 54 CMP - - 6-D? Houston, 15. Go ahead.

11 11 11 58 CC Roger. Remember back aways, we were talking about doing some more mass spec boom tests at 275 hours, which has gone by. We're right now talking about delaying that until 276 hours, approximately, or

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at least until before you start your VERB 49 ma-
neuvres for the next set of P23s. Over.

11 11 12 21 CMP Okay, fine. 6-D.

11 11 12 26 LMP Is that okay on 6-C, the fact that it's - -

11 11 12 28 CMP I don't know; we'll tell them.

11 11 12 30 LMP Okay, 6-D is 45.

11 11 12 36 CMP Okay. And, Houston; 15. I have some command module
RCS injector temperatures for you.

11 11 12 44 CC Ready to copy.

11 11 12 46 CMP Okay, these are readings off the SYSTEMS TEST
meter: 5-A is 4. - or 5-C is 4.2, 5-D is 3.9;
6-A is 4.1, B is 4.2, C is greater than 5, and D
is 4.5.

11 11 13 07 CC Roger. Copy 4.2, 3.9, 4.1, 4.2, greater than, and
4.5.

11 11 13 14 CMP Roger.

11 11 13 30 LMP Here, put it on there, I'll give you a squirt.
How many do you want?

11 11 13 37 CDR Is that the soup?

11 11 13 41 CMP Chicken stew.

11 11 13 42 LMP How many do you want?

11 11 13 43 CDR Three of them.

11 11 13 44 LMP Ready?

11 11 13 45 CDR Yes.

11 11 14 01 CDR Shit.

11 11 14 04 LMP Screw it in there?

11 11 14 05 CDR Good.

11 11 14 06 CMP ...

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11 11 14 13 CDR Yes. Roger.

11 11 14 16 CMP ...

11 11 14 30 LMP Yes.

11 11 14 39 CDR Well, we have a lot of drinks for breakfast.

11 11 14 42 LMP Okay, I ought to change the LiOH. Which one was it, Al?

11 11 14 48 CMP Okay, 23 to B and 21 to A-5.

11 11 14 52 LMP Okay, going into B.

11 11 14 54 CMP 23 into B.

11 11 14 56 LMP Okay.

11 11 16 22 LMP I wonder if any of this food is - the - the irradiated food.

11 11 16 26 CDR Could be. ...

11 11 16 33 LMP One way of preserving food these days is to -

11 11 16 37 CDR ... radiation.

11 11 16 39 LMP And it preserves it. At certain times, radiation preserves it.

11 11 18 01 LMP Okay. Canister change is complete.

11 11 18 03 CDR Okay. Very good.

11 11 19 22 CDR ...

11 11 19 25 LMP That's wrong, Dave.

11 11 19 27 CDR ... - -

TIME SKIP

11 11 30 27 CDR Al, you going to monitor comm? I'm going to get off the headset here.

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11 11 30 29 CMP ...

11 11 32 09 CDR Come forward, Al. Thank you very much. ... Just ruined the whole thing.

11 11 36 48 CMP Oh - damn!

11 11 36 51 CDR Oh, my God.

11 11 37 09 CMP Freaking DAC won't come off.

11 11 37 15 CDR You need one of these, too? That okay?

11 11 37 20 CMP Okay. Okay.

11 11 37 27 CDR There you go. Can I get that for you?

11 11 37 32 CMP Thank you.

11 11 37 36 CDR Ready for it now?

11 11 39 42 CDR ... Move over some. ...

11 11 39 52 CMP If I were you, I'd go over to the lab and pick one up out of there - a perfect sample.

11 11 39 58 CDR They don't have them.

11 11 39 59 CMP They don't?

11 11 40 00 CDR No.

11 11 40 08 LMP Dammit, why don't you buy a set of them? ...

11 11 40 14 CMP I might buy them.

11 11 40 16 LMP Yes, but you'd be taking all that guff.

11 11 40 30 LMP Feast over his favorite rock.

11 11 40 34 CMP Right.

11 11 40 39 CDR ...

11 11 40 40 LMP How come?

11 11 40 41 CMP ...

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11 11 40 53 CMP ...

11 11 41 05 CMP On the ball.

11 11 41 12 CDR ...

11 11 41 30 CMP ... to surprise ...

11 11 41 40 CDR ... 330 ...

11 11 41 49 CMP (Clears throat) You going to do anything else down there? Are you going to do anything down there? All right.

11 11 41 58 CDR ...

11 11 42 02 CMP Well, I've got a P23 to do in 3 minutes, and then we got to ... the daytime. I got to clean up and change my long johns and take my biomed off, while I got the chance.

11 11 42 17 CDR Okay.

11 11 42 58 CMP Okay.

11 11 44 37 LMP Dave, I hope we're going to be able to see them unload all those rocks.

11 11 44 42 CDR Yes, I think we should.

11 11 44 43 LMP Okay.

11 11 44 44 CDR ... time ...

11 11 44 48 LMP I hope so. Yes. They'll just have to hold up the - the rocks until we're there.

11 11 44 58 CDR ... going to have a ball ... Is that why you ...?

11 11 45 07 LMP Yes.

11 11 45 12 CDR ...

11 11 45 15 LMP Yes.

11 11 45 19 CDR ... mind working some long hours.

11 11 45 29 LMP How long does the medical take on the ship?

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[REDACTED]

11 11 45 33 CDR ...

11 11 45 34 LMP ... ship until about what - 6 o'clock tomorrow night? We'll be taking that physical until 10 tomorrow night?

11 11 45 42 CDR Ten their time is all I know.

11 11 45 48 LMP Oh, that's right. It's 4 our time, which is - -

11 11 45 54 CDR On board the ship.

11 11 45 56 CMP Yes. ...

11 11 46 03 LMP Yes.

11 11 46 04 CDR ...

11 11 46 24 CMP ... we're laughing.

11 11 46 46 CDR ...

11 11 46 59 CDR I think we might look ...

11 11 47 35 LMP I had it under control. I had it under control.

11 11 47 41 CDR ...

11 11 48 00 CMP We're all having his.

11 11 48 05 LMP Man, we're down low. The cupboard's bare. Bacon squares.

11 11 48 27 LMP I don't know if we have enough in there for two more. Yes, I guess we do.

11 11 48 52 CDR ...

11 11 48 57 LMP Yes, you need a reinfo - forced toe section.

11 11 50 55 CMP I'll take that and get this - Going to use the camera.

11 11 51 26 LMP Have a 9-hour rest period.

11 11 51 42 LMP Make sure I'm turned on there, will you, Dave? My power on?

[REDACTED]

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Day 12

11 11 52 00 CMP ...

11 11 52 02 LMP What? Yes, if you want to dig it out, it's in the - I put it in that bag. Dave, could you get - Dave, could you get - There's a bag in my TSB. One of the white towel bags that has all my gear in it.

11 11 52 38 LMP Thank you. It's in here, Al.

11 11 55 08 CC Apollo 15, Houston. Over.

11 11 55 11 LMP Go ahead, Bob.

11 11 55 14 CC Roger. If one of you fellows has the time, we might like to continue on with the mass spec boom retract test.

11 11 55 21 LMP Okay. Is it something I should write down, or can I just do it real time?

11 11 55 26 CC Give it to you in real time. It's not that complicated, Jim.

11 11 55 30 LMP Okay. Go ahead.

11 11 55 33 CC 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.

11 11 55 47 LMP Okay. I understand MASS SPEC, EXPERIMENT, ON; and ION SOURCE, ON. Stand by. David, can you get a couple of switches over there? The MASS SPEC, EXPERIMENT, ON; and the ION SOURCE, ON.

11 11 56 08 LMP Okay, Bob. They're both ON.

11 11 56 13 CC Okay. And then next, you 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.

11 11 56 32 LMP Understand you want DEPLOY for 20 seconds and then - on the MASS SPEC BOOM, and then RETRACT until we get gray or 40 seconds.

11 11 56 43 CC Roger. Whichever occurs first.

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[REDACTED]

11 11 56 46 LMP Okay. Okay, Dave. On that MASS SPEC BOOM, we go DEPLOY for 20 seconds. If you want, I can give you a mark.

11 11 56 59 CDR That's okay.

11 11 57 21 CDR They're OFF.

11 11 57 23 LMP Go to OFF and then I'll have you - and then RE - and then RETRACT it for 40 seconds - -

TIME SKIP

11 13 38 18 CDR Oh, 6:45 tomorrow.

11 13 38 22 CMP Yes. ...

11 13 38 26 LMP He didn't.

11 13 38 33 CDR Cabin temp, 67.

11 13 38 36 CMP ...

11 13 44 01 CMP Oh, shit.

[REDACTED]



DAY 13

12 03 56 22 CDR - - NORMAL.

12 03 56 23 LMP TAPE RECORDER's on HIGH BIT RATE. Record the start.

12 03 56 29 CDR Okay. It worked.

12 03 56 32 CMP Yes.

12 03 57 04 CMP 10, 9, 8, 7, 6, 5, 4, 3, 2, 1 -

12 03 57 14 CMP ZERO.

12 03 57 15 LMP ... open.

TIME SKIP

12 06 50 17 LMP Okay, TAPE RECORDER's on HIGH BIT RATE, RECORD, and FORWARD.

12 06 50 25 CDR Here, my friend, is a lunar rock.

12 06 50 28 CMP Yes. Floating around in the space of our spacecraft.

12 06 50 33 CDR Yes. Wonder (laughter) - The sequence of panels we go through is somewhat inane.

12 06 50 41 CMP Oh, it really is, isn't it? God!

12 06 51 13 CMP About 8 minutes.

12 06 51 17 CDR This is the most leisurely entry we've ever done.

12 06 51 19 LMP Yes, I don't understand how - why we have so much time.

12 06 51 21 CMP Stand by. ... fast.

12 06 51 23 CDR It'll go fast.

12 06 51 25 CMP That's because we started 4 hours earlier - -

12 06 51 27 SC (Laughter)

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12 06 51 28 CMP - - than we normally do.

12 06 51 29 CDR (Laughter) That's true. This is our normal reset burn, right here.

12 06 51 39 CC Apollo 15, Houston. You're looking good. About a minute and a half to handover to ARIA.

12 06 51 45 CDR Roger.

12 06 52 00 CDR Separation really unloosened a bunch of stuff.

12 06 52 04 CMP Yes.

12 06 52 05 LMP See my nut come flying by yet?

12 06 52 07 CDR No (laughter). Nor your screw (laughter).

12 06 52 11 LMP Listen, man, I've got my screw right here.

12 06 52 59 CDR Got your camera all ready, Jim?

12 06 53 01 LMP Ready.

12 06 53 02 CMP Don't forget it.

12 06 53 03 LMP I think I'll turn it on at - probably - Oh, look out the window, and you see iona - ionization.

12 06 53 09 CDR Yes.

12 06 53 15 LMP Probably be just before blackout, I guess. Blackout at PT. Yes. Before zero phase.

12 06 53 55 CMP Looks like 5 minutes.

12 06 53 56 CDR Right on. Time is right on.

12 06 53 58 CMP Great.

12 06 54 00 CDR Can't argue with that.

12 06 54 04 CMP My dynamics - or trajectory's changing somewhere, because that light's coming from a different place now.

12 06 54 52 SC (Sneeze)

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[REDACTED]

12 06 55 15 CMP Oh, that's the Earth down there, baby.

12 06 55 18 LMP Can you see it?

12 06 55 19 CDR Sure as hell can. Yes, siree, I hope to tell you.

12 06 55 23 LMP Are we going backwards?

12 06 55 25 CDR It's big and real.

12 06 55 26 LMP Yes. I can see it. Just barely see it out of my window.

12 06 55 29 CMP Yes, we're going backwards.

12 06 55 30 CDR Encouraging.

12 06 55 35 CMP Just check the needle on the peg here; 51 and a couple of minutes until we're down.

12 06 55 40 LMP Is that pausing from minimum impulse?

12 06 55 45 CDR It sure is. Man, that's just bang, bang. That's really neat.

12 06 55 51 CMP I keep thinking that, if I hit the stick quick, that minimum impulse will be less (laughter). Did you ever get that feeling?

12 06 55 56 CDR Yes.

12 06 55 57 CMP There's just a little bit you want to go - -

12 06 55 58 CDR It's right then.

12 06 55 59 CMP -- and you try to get it and you can't quite get there. Yes.

12 06 56 09 CMP Oh, yes. Hey - Oh, man, are we moving, too! Son of a gun! Sheeoo!

12 06 56 21 CDR Yes, indeedy. You ought to be able to see it out the - out the hatch window.

12 06 56 25 CMP Oh my, I sure can. Sure a lot of mountains down there. How about that!

[REDACTED]

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12 06 56 36 LMP Shit, I think that's Alaska out there. That would be right, wouldn't it?

12 06 56 47 CMP Yes. Keep an eye out for the Moon.

12 06 56 49 CDR Yes, keep an eye out for the Moon.

12 06 56 50 CMP We've done it. Oh, we've missed it.

12 06 56 53 CDR 56:37. Oh, Al - -

12 06 56 54 CMP We were too busy watching the Earth.

12 06 56 55 CDR - - why don't you pay attention to what you're doing there.

12 06 56 57 CMP Too busy watching the Earth.

12 06 57 05 CDR I'm not sure there's much you could do about it any - any - to correct it anyway.

12 06 57 09 CMP Not at this point. Here comes the needle off the peg. There it goes. Now let me get to 5. Yes, 55.

12 06 57 17 CDR Okay.

12 06 57 33 CDR Neat.

12 06 57 34 CMP Yes.

12 06 57 35 LMP We just passed south of Alaska.

12 06 57 37 CDR Did we?

12 06 57 38 LMP Yes.

12 06 57 41 CDR Little earlier than usual.

12 06 57 48 CMP Houston, 15; go ahead.

12 06 58 05 CDR Okay, the needle's off the peg.

12 06 58 12 CMP About right.

12 06 58 28 LMP What a view! Whew!

12 06 58 37 CMP Okay, we've got about 10 - 20 seconds to entry interface.

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12 06 58 41 LMP More than that. Oh, EI, yes. ... I don't think I'm going to like it.

12 06 58 55 LMP There's RRT.

12 06 58 57 CDR Okay.

12 06 59 06 LMP Getting the ionization?

12 06 59 08 CDR Yes, man.

12 06 59 09 CMP Put your - -

12 06 59 10 CDR Yes, look at it. Good.

12 06 59 11 CMP Yes.

12 06 59 13 CDR Ionization?

12 06 59 14 LMP Everything looks good.

12 06 59 15 CDR Boy, I guess.

12 06 59 16 CMP .01, .02, 4 -

12 06 59 25 CMP .05G light.

12 06 59 26 CDR Okay, GO. EMS scroll - -

12 06 59 28 LMP .05G switch - -

12 06 59 29 CDR EMS good.

12 06 59 32 LMP .05G switch, on; EMS ROLL, on.

12 06 59 34 CDR They're both on.

12 06 59 35 LMP Okay.

12 06 59 36 CDR Okay. Okay, .39.

12 06 59 42 CMP Okay.

12 06 59 43 CDR .5, .1.

12 06 59 44 LMP .6.

12 06 59 46 CDR .8, 1, 1.3, 2g's, 2g's - -

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12 06 59 53 CMP Accelerometer and the DSKY.
12 06 59 56 CDR Okay.
12 06 59 57 CMP Scroll look good?
12 06 59 58 CDR/CMP 3g's.
12 07 00 01 CDR Three and a half.
12 07 00 03 CMP 4.
12 07 00 04 CDR There's 4.
12 07 00 05 CMP 5.
12 07 00 07 CDR There's 5, 6 -
12 07 00 13 CMP Scroll looks good.
12 07 00 14 CDR There's 6, 6, 6 there, 6.2. Don't see anything on
master alarm.
12 07 00 22 CMP Want the master alarm?
12 07 00 24 CDR Nothing.
12 07 00 25 CMP Huh?
12 07 00 26 CDR Nothing.
12 07 00 27 CMP Okay.
12 07 00 28 CDR 5.6. We roll 180. 5, 4.7 -
12 07 00 37 CMP Looking good.
12 07 00 38 CDR 180 roll, 4, 4.4, 4.2, 4.1. Rolling to 150, 117,
092 - -
12 07 00 52 CMP Okay, looking good.
12 07 00 54 CDR Plus 69, plus 51.
12 07 00 57 CMP Looking good.
12 07 00 58 CDR Plus 49.

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[REDACTED]

12 07 00 59 CMP Okay.

12 07 01 00 CDR 4g's, you're right on.

12 07 01 02 CMP 4g's.

12 07 01 03 CDR Eighty-five, plus 101. Holding 4g's. Lift vector, up.

12 07 01 10 CMP Going up.

12 07 01 11 CDR We're in P67.

12 07 01 12 CMP Good.

12 07 01 18 CDR Okay. Minus 51.

12 07 01 21 CMP Okay.

12 07 01 23 CDR And at 4g's. Minus 110.

12 07 01 31 CMP Okay, we're going in.

12 07 01 34 CDR Minus 116.

12 07 01 35 CMP Okay, 450 miles and that's - -

12 07 01 36 CDR Okay.

12 07 01 37 CMP - - right where we are on the scroll.

12 07 01 49 CDR Okay, at 399, we're - -

12 07 01 51 CMP Okay, we're off the ...

12 07 01 52 CDR - - almost 3g's. Boy, EMS has missed here within about 5 miles.

12 07 01 55 CMP Yes, we're looking good.

12 07 01 58 CDR Seventy-one, minus 70.

12 07 02 00 CMP EMS is -

12 07 02 04 CDR Minus 70.

12 07 02 19 CMP Pretty good.

[REDACTED]

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12 07 02 20 CDR Yes.

12 07 02 23 CMP Minus 70 - -

12 07 02 24 CDR Okay, there's 3g's.

12 07 02 26 CMP And the scroll shows us right on the range to go.

12 07 02 30 CDR Okay.

12 07 02 34 CMP Couldn't be better.

12 07 02 36 CDR Houston, Apollo 15. We're in P67. The EMS and the G&N agree within 15 miles, and everybody's in good shape.

12 07 02 51 CDR Okay, plus 52.

12 07 02 52 CMP Roger. That's where we are. Still pulling 3g's.

12 07 03 01 CDR Okay, stand by.

12 07 03 04 CMP And we're coming right straight down that scroll. Beautiful.

12 07 03 06 CDR Good. Houston, 15. EMS and G&N agree within about 10 miles, and everybody's in fine shape.

12 07 03 28 CMP There they are.

12 07 03 30 CDR Okay, 32 degrees ...

12 07 03 40 CMP Okay, 98, NOUN 18; boy, that's slick.

12 07 03 43 CDR 10,000 feet per second.

12 07 03 50 CMP My eyes were cocked; 100 miles to go. I'm about 4 miles off; so - Looks like even the scroll's working great.

12 07 03 59 CDR Yes. Great. Hey, now I know why you got to check the tunnel for water.

12 07 04 07 LMP Yes, boy, I guess. Did you get wet?

12 07 04 09 CDR Yes, man. ...

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[REDACTED]

12 07 04 13 LMP Yes, it really comes barreling out of there, doesn't it? (Laughter)

12 07 04 19 CDR Okay. ... - -

12 07 04 20 CMP Sixty miles to go. Okay, up.

12 07 04 24 CDR ...? 33 and 46. Boy, they really agree.
6000 ... - -

12 07 04 37 CMP Getting our cross range right now.

12 07 04 44 CDR Hey, Houston; 15 in the blind. The EMS and G&N agree within about 10 miles.

12 07 04 52 CMP Gee, what makes you feel - sound so hollow?

12 07 04 55 LMP Sounds like ... is about to make a low pass on us.

12 07 04 58 CMP Yes.

12 07 04 59 CDR We're coming up to 38. Watch your steam pressure, Jim.

12 07 05 01 LMP Standing by.

12 07 05 17 CMP It's 3000.

12 07 05 18 CDR No steam pressure yet?

12 07 05 19 LMP It's going up now.

12 07 05 20 CDR Okay.

12 07 05 21 LMP Okay, steam pressure's pegged.

12 07 05 24 CMP Okay, we should get - 50K in about another 600 feet. Got 9 miles to go on EMS.

12 07 05 34 CDR Okay. Should be getting a NOUN 67 here directly.

12 07 05 47 CDR Okay, Houston; 15 in the blind. Latitude, plus 26.12; longitude, minus 158.17 - -

12 07 05 54 CMP Okay, we're off the peg.

12 07 05 55 CDR - - and about a 2.2 off the peg.

[REDACTED]

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12 07 05 56 LMP Okay, CABIN PRESSURE to BOOST/ENTRY.
12 07 06 00 CMP BOOST/ENTRY.
12 07 06 01 LMP SEQUENCE PYRO, two, to ARM.
12 07 06 04 CMP PYRO to ARM.
12 07 06 07 LMP Standing by for 30.
12 07 06 09 CDR/CMP Okay.
12 07 06 11 CMP We're out of 40.
12 07 06 16 CDR Okay, Houston; 15. Out of 40K, and we're showing about a .7, .2, this business now. Everybody's in good shape.
12 07 06 27 LMP How's the altitude, Al?
12 07 06 29 CMP Coming up on 30.
12 07 06 30 CDR Okay - -
12 07 06 31 CMP Okay, 30K.
12 07 06 32 LMP Okay, ELS LOGIC, on.
12 07 06 33 CMP ELS LOGIC, on.
12 07 06 35 LMP ELS, AUTO.
12 07 06 36 CMP AUTO, on.
12 07 06 38 CDR Okay. Stand by for - -
12 07 06 39 LMP Standing by for drogues at 24. There go the - there goes the apex. There are the drogues.
12 07 06 50 CMP Good drogue.
12 07 06 52 LMP Okay, cabin pressure's increasing.
12 07 06 55 CMP All right.
12 07 06 58 LMP Standing by for mains - at 10.
12 07 07 02 CMP Okay, we're out of 18.

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12 07 07 15 CDR Give us a call when you get to 10.

12 07 07 17 CMP Well, coming out of 14, 13, out of 12, 11,000.

12 07 07 34 LMP Okay.

12 07 07 37 SC (Sigh)

12 07 07 38 LMP Okay, the mains are up there.

12 07 07 40 CMP And the mains are out, three.

12 07 07 42 CDR Okay - -

12 07 07 43 CMP Okay.

12 07 07 44 CDR - - Apollo 15 has good mains.

12 07 07 45 CMP The mains are opening.

12 07 07 46 LMP SURGE TANK O₂, off, A1.

12 07 07 48 CMP SURGE TANK O₂ coming off.

12 07 07 51 LMP REPRESS PACKAGE, OFF.

12 07 07 53 CDR Let's go, A1.

12 07 07 54 CMP REPRESS, OFF.

12 07 07 57 LMP DIRECT O₂, OPEN.

12 07 07 58 CMP DIRECT O₂, OPEN.

12 07 08 02 P - - the bearing is 130 to - three main chutes. I have visual contact; three main chutes.

12 07 08 08 CMP - - 8000.

12 07 08 09 OKI Okinawa, Roger. Out.

12 07 08 10 LMP - - PRESSURE RELIEF, two, CLOSED.

12 07 08 11 CMP CLOSED.

12 07 08 13 LMP CM RCS LOGIC, on, up.

12 07 08 14 CDR ... 2, Apollo 15. We're showing about a minus .6 - -

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12 07 08 16 CMP RCS LOGIC, on.

12 07 08 17 CDR - - on the miss distance - -

12 07 08 18 LMP CM PROPELLANT to DUMP.

12 07 08 19 CDR - - Everybody's in good shape.

12 07 08 28 R Okinawa, Recovery has a recovery beacon contact, bearing 175 magnetic. On station.

12 07 08 34 OKI Okinawa here.

12 07 08 37 S-2 Okinawa, this is Swim 2. I have a visual contact bearing 010, that's approximately 1 mile. My position, 134; Okinawa 8.5 miles. Altitude is about 6000 feet to the command module.

12 07 08 52 OKI Okinawa, Roger. Out.

12 07 08 58 S-1 Okinawa, this is Swim 1. I have recovery beacon, 115 degrees magnetic, at 270, 12 miles, at time 47. Over.

12 07 09 11 OKI Okinawa, Roger. Out.

12 07 09 16 CMP Pick out the place.

12 07 09 19 CDR Okay?

12 07 09 20 CMP Okay - -

12 07 09 21 P This is Photo. I have one - there's something - something's falling beside the command module. I could not tell what it was, though.

12 07 09 31 LMP Strut locks, four, unlocked.

12 07 09 33 R Apollo 15, Apollo 15, this is Recovery. Over.

12 07 09 38 CDR Recovery, Apollo 15. Everybody's in good shape, and we're looking at about 3500 feet.

12 07 09 43 R This is Recovery. I have a visual of 165 - -

12 07 09 47 LMP Ten seconds to release.

12 07 09 48 R - - from me, about 8 miles.

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[REDACTED]

12 07 09 51 CDR Go ahead, Jim.

12 07 09 52 LMP Stand by for purge dump.

12 07 09 53 P This is Photo. It appears that one of your main chutes is streaming. I can only see two main chutes, and one appears to be streaming.

12 07 10 02 OKI Yes. ... two chutes concurred.

12 07 10 05 P They have one streaming chute.

12 07 10 06 LMP Do we have three, Al?

12 07 10 07 CMP We got two.

12 07 10 08 CDR No, we're at 3000 - -

12 07 10 09 LMP Stand by for ... - -

12 07 10 10 P Okinawa, this is Photo 1 - -

12 07 10 12 LMP - - ...

12 07 10 13 CMP Okay.

12 07 10 14 P - - the extra fuel has been jettisoned and burned off.

12 07 10 17 CDR Cinch up, gang.

12 07 10 18 CMP Cinch up, gang.

12 07 10 19 R Apollo 15, Apollo 15, this is Recovery. Over.

12 07 10 23 CDR Got your VHF beacon on?

12 07 10 24 CMP 3000 - -

12 07 10 25 LMP Yes, it's - -

12 07 10 26 CMP - - Jim.

12 07 10 27 CDR 3000, Jim.

12 07 10 28 LMP Okay, CM RCS PROPELLANT, two, OFF.

12 07 10 29 CMP OFF.

[REDACTED]

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12 07 10 30 CDR Okay.

12 07 10 31 CMP Two, off.

12 07 10 32 LMP CABIN PRESSURE RELIEF VALVE to DUMP.

12 07 10 34 CMP All right, coming to DUMP.

12 07 10 36 LMP FLOODs to POSTLANDING.

12 07 10 43 CMP Coming up on 2000.

12 07 10 45 CDR How many chutes we got, Al?

12 07 10 46 CMP We got two.

12 07 10 47 LMP Two.

12 07 10 48 CMP We got a streamer on one.

12 07 10 49 LMP FLOODs to POSTLANDING.

12 07 10 51 CMP FLOODs to POSTLANDING.

12 07 10 52 LMP Stand by for 800.

12 07 10 54 P This is Photo. Lost contact due to cloud cover.

12 07 10 57 R Apollo 15, Apollo 15, this is Recovery. Over.

12 07 11 02 CDR Roger, Recovery; 15. You're 5 square. Everybody's in good shape.

12 07 11 04 CMP Okay, we're out at 1500, Jim.

12 07 11 05 LMP Okay.

12 07 11 06 R Roger, Apollo 15. If you hear, all units have you in sight, and we are eastbound now.

12 07 11 11 CDR Roger.

12 07 11 13 CMP 1000 feet, Jim.

12 07 11 14 LMP Okay - -

12 07 11 15 CDR ... dump.

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[REDACTED]

12 07 11 16 LMP - - CABIN PRESSURE RELIEF to CLOSE.
12 07 11 17 OKI Apollo 15 - -
12 07 11 18 CMP CLOSED.
12 07 11 19 OKI - - this is Okinawa. Request your splashdown read-
out. Over.
12 07 11 21 LMP Okay, you ready for MAIN BUS TIES to come OFF.
12 07 11 23 CDR Roger. Plus 26.13, minus 158.12.
12 07 11 26 CMP Ready for BUS TIES.
12 07 11 28 P This is Photo. Approaching ...
12 07 11 30 CMP Okay.

END OF TRANSCRIPT

[REDACTED]