

MSC-04055



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Classification changed to U

By authority of JSC Security Class. officer

Date 11/9/73 - 2/9/78

APOLLO 14

ONBOARD VOICE
TRANSCRIPTION

(U)

RECORDED ON THE
COMMAND MODULE
ONBOARD RECORDER
DATA STORAGE EQUIPMENT
(DSE)

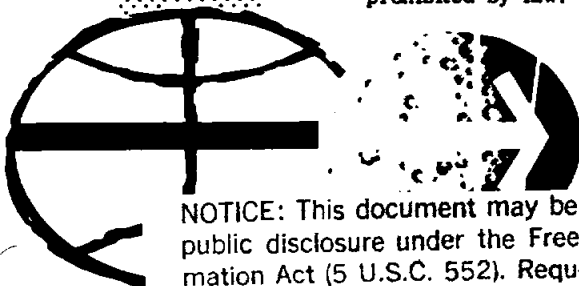
MARCH 1971

GROUP 4

Downgraded at 3-year
intervals; declassified
after 12 years

CLASSIFIED DOCUMENT - TITLE UNCLASSIFIED

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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.

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INTRODUCTION

This document is the transcription of the Apollo 14 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 questions 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.

Beginning with this mission, 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 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.

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 of a self-interruption. Two dashes (- -) are used to indicate an interruption by another speaker or a point at which a recording was abruptly terminated.

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The Apollo 14 mission was flown January 31 to February 9, 1971; lift-off occurred at 21:03:02 G.m.t. (4:03:02 e.s.t.) on January 31.

Speakers in the transcript are identified as follows:

Spacecraft:

CDR	Commander	Alan B. (Al) Shepard, Jr.
CMP	Command module pilot	Stuart A. (Stu) Roosa
LMP	Lunar module pilot	Edgar D. (Ed) Mitchell
SC	Unidentifiable crewmember	
MS	Multiple speakers	

Mission Control Centers:

CC	Capsule communicator (CAP COMM)
LCC	Launch control center

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DAY 1

Day	Hour	Min.	Sec.		
00	00	00	00	LCC	ZERO -
00	00	00	01	LCC	RELEASE. LIFT-OFF.
00	00	00	02	CMP	Lift-off. Clock start. P11.
00	00	00	04	CDR	The clock start?
00	00	00	09	CMP	Beautiful!
00	00	00	10	LCC	Clear the tower!
00	00	00	11	CDR	Tower clear. Roll and pitch start. Oh! Look at that ... - -
00	00	00	14	CC	Roger; you have good thrust in all five engines - -
00	00	00	16	CDR	Beautiful.
00	00	00	18	CMP	Go, baby, go!
00	00	00	21	LMP	She's going; she's going. Everything's good.
00	00	00	24	CDR	Okay.
00	00	00	29	CDR	Okay, Houston. Roll complete.
00	00	00	30	CC	Roger. Roll complete.
00	00	00	37	CMP	37, 38 - -
00	00	00	39	CC	Stand by for Mode I Bravo.
00	00	00	40	CMP	40, 41 - -
00	00	00	42	CC	MARK; I Bravo now.
00	00	00	43	CDR	Okay, we're I Bravo.
00	00	00	44	CMP	I Bravo.
00	00	00	49	CDR	Okay. Coming up on our favorite number, babe.
00	00	00	51	CMP	Stand by. I didn't want you to - I was going to give you that one.

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00 00 00 56 CDR CABIN PRESSURE RELIEF.

00 00 00 57 CMP Okay.

00 00 00 58 CDR Good.

00 00 01 00 CMP One minute and 69.

00 00 01 12 CC 14, Houston. Everything looks good here on the ground.

00 00 01 16 CDR Roger.

00 00 01 29 CDR And we got through MAX q real fine, troops.

00 00 01 32 CMP Yes.

00 00 01 36 LMP Watch her go.

00 00 01 40 CDR Now, we're off and running. Look at the ice coming off.

00 00 01 50 CDR Okay, coming up on 2 - -

00 00 01 52 CMP Roger.

00 00 01 54 CDR - - 3, 2 and a half g's.

00 00 01 56 CC Stand by for Mode I Charlie.

00 00 01 59 CC MARK; I Charlie now.

00 00 02 00 CMP I Charlie.

00 00 02 01 CDR We're I Charlie. EDS AUTO's OFF.

00 00 02 03 CC Roger.

00 00 02 06 CDR Okay, inboard in about 10 seconds.

00 00 02 07 CMP Roger.

00 00 02 14 CMP Okay, about 2 seconds.

00 00 02 16 CDR INBOARD CUT-OFF.

00 00 02 18 CC Inboard.

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00 00 02 21 CDR ...

00 00 02 26 CMP Okay, attitude is good.

00 00 02 28 CDR Yes.

00 00 02 32 CDR About 10 seconds to cut-off.

00 00 02 37 CMP ...

00 00 02 38 CDR Okay.

00 00 02 41 CDR Five to go.

00 00 02 45 CDR CUT-OFF.

00 00 02 46 CMP SEPARATION.

00 00 02 49 CDR IGNITION on five.

00 00 02 51 CMP Okay. You could see the flare from lift-off.

00 00 02 55 LMP You sure could. Uh-huh.

00 00 02 58 CDR Looks good on five engines.

00 00 02 59 CMP Oh, beautiful.

00 00 03 02 CC Roger. We confirm good thrust on all five engines.

00 00 03 06 CMP Okay. Passing 3 minutes.

00 00 03 07 CDR ...

00 00 03 08 CMP If we don't get that job - -

00 00 03 10 CDR S-II SEP.

00 00 03 11 CMP - - We're about 4 seconds from S-II SEP. Right.

00 00 03 13 CDR S-II SEP.

00 00 03 14 CMP Good SEP.

00 00 03 15 CDR Let her go, Stu.

00 00 03 18 CMP 17, 18, 19, 20.

00 00 03 19 CDR ...

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00 00 03 20 CDR There goes the tower!

00 00 03 22 CMP There she goes!

00 00 03 23 CC We confirm the skirt SEP, and you're in Mode II now.

00 00 03 26 CDR Mode II.

00 00 03 27 CMP We're in Mode II in the cockpit, troops.

00 00 03 28 CDR Okay - -

00 00 03 29 LMP STEAM PRESS, WATER, AUTO.

00 00 03 30 CDR - - PITCH to RATE - PITCH to RATE COMMAND.
DELTA V_C .

00 00 03 31 CC Roger, Ed.

00 00 03 32 CMP ...

00 00 03 38 CMP Better watch this; that horizon is beautiful.

00 00 03 40 LMP It sure is!

00 00 03 42 CDR Keep your eyes on the pin, cockpit troops.

00 00 03 45 CMP Yes. Okay, we're coming up toward 4 minutes.
We're pitching 42.6; it looks real good, leader.

00 00 03 50 CDR Yes.

00 00 03 51 CDR 42.7 right now. That's good.

00 00 03 59 CMP And that center engine is burning.

00 00 04 01 CC 14, Houston. At 4 minutes, trajectory and guidance look good - -

00 00 04 05 CMP Okay, 4 minutes, 6 ... - -

00 00 04 06 LMP 14; Roger.

00 00 04 07 CMP Right smack dab in the money.

00 00 04 08 LMP Beautiful.

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00 00 04 09 CMP Just smack dab in - -

00 00 04 10 CC And, 14; Houston. The CMC is GO.

00 00 04 14 CDR Roger; CMC, GO.

00 00 04 20 CMP We're about 50 miles, Ed.

00 00 04 22 LMP Oh, great. Everything's GO on this side, Al.

00 00 04 27 CDR Good show, buddy.

00 00 04 29 LMP Okay.

00 00 04 31 CMP 04:30. 73.5. We are absolutely beautiful. It is right in the fracking money. There's a little more ice flaking off.

00 00 04 43 CDR Okay. We're still upstaging for three-on program at this point.

00 00 04 50 CMP We don't have S-IVB - -

00 00 04 51 LMP No, we don't. No, we don't. That's right. COI's 5:45, not 4:45.

00 00 05 02 CMP And at 5 minutes. Eighty miles. We're riding within two or three tenths of - of this profile. Beautiful.

00 00 05 10 LMP Just can't beat it, huh?

00 00 05 12 CMP Smooth. Just looks like a little side oscillation in the couch.

00 00 05 17 LMP That's all you're feeling; just like a railroad coach is this couch.

00 00 05 21 CDR Okay, 5 plus 20; we should have COI here in 25 seconds.

00 00 05 41 CMP ... 25 seconds. About 13 2, 8 26 - -

00 00 05 47 CC Stand by for S-IVB to COI.

00 00 05 49 CC MARK. S-IVB to COI, now.

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00 00 05 52 CDR S-IVB to COI. Okay, Ed-babe, stand by for the GIMBAL MOTORS.

00 00 05 55 LMP GIMBAL MOTORS - -

00 00 05 56 CC Roger. Your times are nominal. Level sense arm, 8 plus 39; and S-II - -

00 00 06 01 CMP Understand - -

00 00 06 02 CC - - ...

00 00 06 03 CMP PITCH 1.

00 00 06 04 LMP I've got it.

00 00 06 05 CMP YAW 1.

00 00 06 06 LMP Got that one.

00 00 06 07 CMP PITCH 2.

00 00 06 08 LMP Got that one.

00 00 06 10 CMP YAW 2.

00 00 06 11 LMP Got that one.

00 00 06 12 CDR Okay. GPI. Verify a minus 145 and plus 130.

00 00 06 15 CMP Roger.

00 00 06 16 LMP ...

00 00 06 21 CDR Houston, gimbal motors are running.

00 00 06 24 CC 14. Gimbal motors on.

00 00 06 29 CMP At 6:30. I think we got TLI, now, on that center engine, no matter what.

00 00 06 32 CDR I think you're right - -

00 00 06 33 CMP Yes.

00 00 06 34 CDR - - about 2 and a fourth before nominal here. The heat's still going.

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00 00 06 39 CC Stand by for S-IVB to orbit.

00 00 06 41 CC MARK. You have S-IVB to orbit now.

00 00 06 44 CDR Roger. S-IVB orbit.

00 00 06 47 CMP And it's beautiful. This trajectory is absolutely fantastic.

00 00 06 53 LMP Right along the ...

00 00 06 54 CMP It's better than the simulator.

00 00 06 56 CDR Okay. We got about 45 seconds now. ... nominally.

00 00 07 03 CMP Eleven minutes.

00 00 07 04 CDR This guidance is steady as a rock.

00 00 07 07 CMP We are right in the numbers. Just right - ... seems like there's something I ought to be doing. Strike 20 seconds from the board. ... now.

00 00 07 30 LMP There, it's real comfortable.

00 00 07 36 CDR About 5 seconds.

00 00 07 44 CDR INBOARD CUT-OFF.

00 00 07 45 CC Roger. Inboard.

00 00 07 47 CMP Right on time.

00 00 07 49 LMP That's beautiful.

00 00 07 51 CMP That computes to ... - -

00 00 07 52 CDR There she goes.

00 00 07 56 CMP Hey, did you feel that PU valve?

00 00 07 57 LMP Yes.

00 00 07 59 CDR Yes. Sure did. Didn't hear it though.

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00 00 08 02 CMP Well, I - I had to give you noise from the simulator. Good. Can't give you everything. We're within 2/10ths in altitude. Just right down the money.

00 00 08 14 CDR Stay that way, baby.

00 00 08 18 CDR About 20 seconds to level sense arm.

00 00 08 25 CC 14, Houston. You're GO for staging. The CMC's GO.

00 00 08 29 CMP Roger. CMC, GO. Just a little high, but it's bringing the H-dot down. Just a little vibration about ... - -

00 00 08 42 CC We have level sense arm.

00 00 08 44 CDR Roger. Level sense arm.

00 00 08 46 CMP Very slight pogo and starting at 8:40.

00 00 08 49 CDR Yes.

00 00 08 53 LMP Time hack. You ought to be pretty close to Mode IV.

00 00 09 06 CMP Just a little high. We're about a mile high. It ought - -

00 00 09 09 CC Stand by for Mode IV capability.

00 00 09 12 CC MARK. You have it now.

00 00 09 14 CDR ... seconds to speed. Roger. Mode IV.

00 00 09 16 CMP Okay. We're at 100 ...

00 00 09 17 CDR Should have a cut-off. We have a -

00 00 09 20 CDR CUT-OFF.

00 00 09 21 CC Roger. Cut-off.

00 00 09 22 LMP Look at the flakes go.

00 00 09 23 CDR And staging.

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00 00 09 24 CMP Look at the ice go up there.

00 00 09 25 LMP Yes. ...

00 00 09 26 CDR And good thrust on 1.

00 00 09 27 CMP There's a big outside.

00 00 09 29 LMP A jillion stars.

00 00 09 30 CDR Good thrust on 1.

00 00 09 31 CMP Okay.

00 00 09 33 CC 14, Houston. Thrust looks good on S-IVB.

00 00 09 37 CDR Thank you.

00 00 09 40 CMP Okay. Okay. We're at 101.3 and it's bringing the H-dot down. Starting our run now.

00 00 09 48 CDR ... - -

00 00 09 49 CMP Just about 2000 feet to go.

00 00 09 53 CDR ... in Mode IV.

00 00 09 54 CMP At 101.5, I'll - Okay. We have 100, 25, 5; 77, 25, 5; 15. Okay. 256 60.

00 00 10 05 CDR 256 60.

00 00 10 07 CMP Is - is our shutdown.

00 00 10 09 CDR Okay. On the stage switch.

00 00 10 10 CMP On the stage switch.

00 00 10 11 CDR ... get it - -

00 00 10 12 CC 14, Houston. Everything's looking perfect here.

00 00 10 17 CMP Roger.

00 00 10 20 CMP H-dot is just about zero. We're 102 - -

00 00 10 23 CDR Here, I can get it.

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00 00 10 26 CMP Okay. Got about 1500 feet to go.

00 00 10 30 CDR Okay.

00 00 10 32 CMP It's pretty damn nominal, isn't it, so far?

00 00 10 34 MS Boy.

00 00 10 35 CMP Magnificent.

00 00 27 59 CMP Down here somewhere. There, you're getting close.

00 00 28 02 LMP Don't see it. There it comes.

00 00 28 04 CMP ...

00 00 28 05 CDR Cut the ...

00 00 28 06 CDR Okay. MAIN REG B valve, OPEN; and A valve, closed.

00 00 28 09 CMP A, closed.

00 00 28 10 LMP Okay. EMERGENCY CABIN PRESS, select 2.

00 00 28 12 CMP 2.

00 00 28 13 LMP Push to test.

00 00 28 15 CMP Tested.

00 00 28 16 LMP ... MAIN REG A valve, OPEN.

00 00 28 20 CMP OPEN.

00 00 28 21 LMP EMERGENCY CABIN PRESS, select closed.

00 00 28 23 CMP Close.

00 00 28 24 LMP Okay. Here, let me get you started on your optics.

00 00 28 26 CMP Can I borrow that ... back again? Oh, there she be.

00 00 28 31 LMP Okay. Ready for your optics, Stuart?

00 00 28 36 CMP No, not quite yet. Let me get my handholds down here, so - -

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00 00 28 39 LMP Okay. Well, holler when you're ready, and I'll come back to you.

00 00 28 42 CDR We're probably pretty well ahead of schedule, timewise, aren't we?

00 00 28 44 LMP Well, I'm a little behind on - -

00 00 28 46 CMP No, we're not really - -

00 00 28 48 LMP - - Carnarvon LOS, now. Okay, service module RCS monitor check. I've got all eight of them gray. Okay. 115 to 140 75. That all looks good. HELIUM PRESS - -

00 00 29 14 CMP ...

00 00 29 15 CDR Okay.

00 00 29 16 CMP Thank you.

00 00 29 17 LMP - - 42.

00 00 29 18 CDR Okay. Can I help you with anything now?

00 00 29 20 LMP You can read the helium pressures - I'll - I'll get those. I just thought that - -

00 00 29 24 CDR On the quads?

00 00 29 25 LMP Yes.

00 00 29 26 CDR Okay. You on B, now?

00 00 29 28 CMP Now, why did they put those that way?

00 00 29 29 LMP Yes.

00 00 29 32 CDR Okay. And you want - -

00 00 29 35 LMP 4000.

00 00 29 36 CDR - - quantity's 100 and full scale high and tank temp is 74.

00 00 29 41 LMP Okay.

00 00 29 43 CDR You got tank temp down there?

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00 00 29 45 LMP Okay - -

00 00 29 46 CDR For - ... - -

00 00 29 47 LMP - - Let me just get the pressures and then the tanks and the quantities, because I have to copy them all down.

00 00 29 54 LMP 41.

00 00 29 55 CDR Helium, 41 on C.

00 00 29 57 LMP Okay.

00 00 29 59 CDR 41 on B. Now, what do you need?

00 00 30 02 LMP Okay. That's helium - I need manifold PRESS.

00 00 30 08 CDR Okay. Manifold pressure is 200 on D -

00 00 30 12 LMP Okay.

00 00 30 13 CDR 200 on C.

00 00 30 15 LMP Okay.

00 00 30 16 CDR 200 on B.

00 00 30 17 LMP Okay.

00 00 30 18 CDR And 200 on A.

00 00 30 19 LMP Very good.

00 00 30 20 CDR ...

00 00 30 21 LMP Okay. Helium tank temp - I need to record.

00 00 30 22 CDR Okay. Tank temp's on A at 75.

00 00 30 26 LMP 75.

00 00 30 27 CDR B is 74; C is 81; and D is 77.

00 00 30 36 LMP Okay. Propellant quantity.

00 00 30 38 CDR B, full scale high - -

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00 00 30 40 LMP Okay.

00 00 30 41 CDR C, full scale high; D is full scale high; A is full scale high. That baby had a full load.

00 00 30 48 LMP Okay. Okay, command module RCS monitoring. Talkback, gray.

00 00 30 56 CMP I'll get the cameras in a little bit.

00 00 30 57 LMP Yes. Okay, we're in no hurry - -

00 00 30 59 CMP I'm going to read my optics dust cover jettison.

00 00 31 01 LMP Okay.

00 00 31 02 CDR Yes. We didn't have to worry about the cameras before.

00 00 31 04 LMP 60, 90. 60, 90.

00 00 31 05 CMP Yes.

00 00 31 06 LMP That looks good - -

00 00 31 07 CMP Okay. Install optics eyepieces and handles - -

00 00 31 08 LMP - - 41 to 42 - -

00 00 31 09 CMP - - that's done. G/N POWER, OPTICS, on (up).

00 00 31 11 LMP - - Manifold PRESS 81 to 105. That's good. Those are good. Okay. Secondary radiator leak check.

00 00 31 23 CMP OPTICS ZERO, OFF.

00 00 31 26 LMP ... quantity - -

00 00 31 27 CMP OPTICS ZERO, ZERO.

00 00 31 28 LMP Al, could I have the SECONDARY GLYCOL to RADIATOR valve - -

00 00 31 30 CMP OPTICS MODE, MAN.

00 00 31 31 LMP - - NORMAL for 30 seconds and then BYPASS.

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00 00 31 32 CMP OPTICS COUPLING ... DIRECT; OPTICS SPEED control, HI.

00 00 31 48 LMP Okay.

00 00 31 52 CMP Okay. That'll be 15 seconds. Okay, let's see if we've got the monitor. Optics hand control, okay, is MANUAL, HI, DIRECT, and going max right. Going about 40 degrees. And this one ought to go about 150.

00 00 32 18 CMP Man! It looks - It's pure black. Can't see because I'm not adapted. ... lens cover. And you need to ...

00 00 32 35 LMP Did you get all of your jettison - optics dust cover jettison checklist, Stu?

00 00 32 39 CMP Yes, I did.

00 00 32 41 LMP Okay. G/N OPTICS, on. OPTICS ZERO, OFF.

00 00 32 44 CMP Yes.

00 00 32 45 LMP ZERO for 15.

00 00 32 47 CMP That's verified.

00 00 32 48 LMP OPTICS ZERO, OFF. OPTICS MODE, MANUAL then.

00 00 32 50 CMP That's verified.

00 00 32 52 LMP COUPLING control, DIRECT, and HI SPEED - SPEED control, HI, and max right until ejected.

00 00 32 58 CMP That's verified.

00 00 32 59 LMP Okay.

00 00 33 00 CDR Okay, Ed. You want to go from NORMAL to BYPASS, now?

00 00 33 03 LMP Yes, for 30 seconds.

00 00 33 04 CDR Okay, here it is right now. ...

00 00 33 06 LMP Okay, I got it.

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00 00 33 07 CDR Oh, wait a minute. Wait a minute. Something's wrong here. ...

00 00 33 10 LMP No. No. I wanted SECONDARY GLYCOL to RADIATOR valve for NORMAL. SECONDARY GLYCOL.

00 00 33 15 CDR Okay. GLYCOL, SECONDARY RADIATOR valve - I can't see that mother.

00 00 33 24 CMP Man! Those stars are dimmer than they are in the simulator.

00 00 33 27 LMP Is our - light in here bothering you, Stuart?

00 00 33 30 CMP No. No, I - I've got them.

00 00 33 38 CDR Okay, Ed. I think I've got it now.

00 00 33 41 LMP Okay. You've got her in BYPASS, huh?

00 00 33 47 CDR No, wait a minute. God damn it! I just cannot feel it.

00 00 33 49 LMP Yes.

00 00 33 53 CDR I can't feel it. The simulator's got a big red stripe on it. Maybe if I get my little finger in there, I can line it up.

00 00 34 08 LMP ...

00 00 34 25 CMP Okay. Start with star 22 for the first one, if you've got a chance to write it - -

00 00 34 29 LMP Okay. Star 22.

00 00 34 31 CDR Okay.

00 00 34 32 CMP The other will be star 24.

00 00 34 33 LMP And the other will be star 24.

00 00 34 34 CMP Yes. Gienah. Oh, I ...

00 00 34 37 LMP Okay, Al. It's in BYPASS, huh?

00 00 34 40 CDR You want it in BYPASS?

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00 00 34 41 LMP I'm sorry. I want it in NORMAL for 30 seconds.

00 00 34 42 CDR It's in NORMAL. Has been for - 10 seconds.
I'll ...

00 00 34 45 LMP Okay. I'm just watching the - quantity there.

00 00 34 47 CDR Okay, that's about 30 seconds.

00 00 34 58 LMP It looks good. We have no leaks.

00 00 35 01 CDR Okay, back in BYPASS.

00 00 35 03 LMP Okay. I'm ready to set a configuration here. I
need the GLYCOL RESERVOIR BYPASS valve to OPEN.

00 00 35 12 CDR Okay. Stand by 1. GLYC BYPASS valve, OPEN.

00 00 35 20 LMP OUT valve, CLOSED; IN valve, CLOSED.

00 00 35 22 CDR OUT valve, CLOSED; IN valve, CLOSED.

00 00 35 27 LMP Okay. And we want to fill the PRIMARY ACCUMULATORS.

00 00 35 31 CMP Oh, shit!

00 00 35 33 LMP What?

00 00 35 34 CMP Oh, I got four balls.

00 00 35 35 CDR Oh, God. Too bad.

00 00 35 37 LMP What did he get, four balls 1?

00 00 35 38 CDR Yes. He got a 1.

00 00 35 40 CMP Oh, hell.

00 00 35 41 CDR Too bad, babe.

00 00 35 42 CMP I'm tempted to repeat it. I think I will.

00 00 35 45 CDR Okay.

00 00 35 46 LMP Okay.

00 00 35 47 CDR You want the PRIMARY ACCUMULATOR FILL, huh?

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00 00 35 48 LMP Yes, please.

00 00 35 49 CDR Okay. Stand by.

00 00 36 25 CDR Okay, Ed. Here it comes. It's ON.

00 00 36 28 LMP All right, it's on. Okay. Okay, you can shut it off. I've got almost 60 percent.

00 00 36 39 CDR Okay, it's OFF.

00 00 36 41 LMP Okay. Okay, ECS RADIATOR, FLOW - FLOW CONTROL to POWER. POWER. PRIMARY GLYCOL to RADIATOR valve, NORMAL, push.

00 00 36 57 CDR Okay, down she goes.

00 00 37 00 LMP ECS RADIATOR HEATER, PRIM 1.

00 00 37 02 CDR Hear it? Gurgle, gurgle, gurgle, gurgle, gurgle.

00 00 37 04 LMP Yes, and there she came. I saw it.

00 00 37 09 CDR (Laughter) Gurgle, gurgle, gurgle. Okay.

00 00 37 15 LMP Okay. We want to watch ECS RAD TEMP PRIM OUT below PRIM IN. It's below PRIM IN. It's looking good already. ECS talkback, gray. GLYCOL EVAP TEMP IN to AUTO.

00 00 37 41 CMP There we go.

00 00 37 42 CDR There you go, babe.

00 00 37 43 LMP Got a four ball.

00 00 37 44 CDR Yes, he did.

00 00 37 45 CMP Son of a bitch. Got five balls.

00 00 37 46 CDR Good show. We won't count the first one.

00 00 37 48 CMP No. Okay. With 22, 24, five balls.

00 00 37 53 LMP Okay.

00 00 37 54 CMP And there's a NOUN 93.

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00 00 37 55 LMP Okay.

00 00 37 56 CDR You want to copy them?

00 00 37 57 LMP Yes, I'm copying them. 89 - -

00 00 37 58 CDR 00085.

00 00 38 00 LMP 8 5?

00 00 38 01 CDR Right.

00 00 38 02 LMP Sorry.

00 00 38 03 CDR And second - R_2 is plus 00010; R_3 - -

00 00 38 06 LMP 10?

00 00 38 07 CDR Right. R_3 is plus 00166.

00 00 38 11 CMP Okay, and let's say it's 38:15.

00 00 38 12 LMP ... 1. 38.

00 00 38 15 CMP 15.

00 00 38 16 CDR Right.

00 00 38 17 CMP Torque.

00 00 38 18 LMP 15.

00 00 38 19 CDR Torque at 38:15.

00 00 38 20 CMP Okay. Optics - Now, that - if - I stow the eye-
pieces, don't I?

00 00 38 28 LMP Stow optics eyepieces.

00 00 38 29 CMP Yes.

00 00 38 30 LMP That's affirm.

00 00 38 31 CMP OPTICS ZERO to ZERO.

00 00 38 32 LMP And if we torqued, we should realine the GDC -

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00 00 38 36 CDR Okay. Now - Yes, just a minute. Go OPTICS ZERO after we get them down to a certain angle, right?

00 00 38 43 CMP Yes, I'm going to try to do that. It's really not part of our operation, but you can't go wrong doing it.

00 00 38 49 LMP I'm - I'm going to bring the purge on. We'll get a MASTER ALARM.

00 00 38 58 CDR Okay. Ball 1 ATT set, IMU. Roll was about - 180. Fuel cell 2, okay. And the yaw is set about - that much and the pitch is way over at 220.

00 00 39 52 LMP Okay. Fuel cell purge is complete.

00 00 40 02 CMP Okay. Does it call for me to turn the OPTICS - G/N OPTICS POWER, OFF?

00 00 40 06 LMP ... 16.

00 00 40 07 CMP Here, I should get out my checklist. ...

00 00 40 10 LMP OPTICS - Let's see. No, I don't see that. It says POO - -

00 00 40 15 CMP RETICLE - -

00 00 40 16 LMP - - RETICLE BRIGHTNESS, dim.

00 00 40 17 CMP Okay. Stow optics eyepieces and increase S-band volume. I never decreased it. You know, we don't have any - We have SQUELCH, ENABLE?

00 00 40 26 LMP That's affirm.

00 00 40 27 CMP Okay. You can tell it, can't you?

00 00 40 31 LMP Sure can.

00 00 40 33 CMP Okay. Well, ha ha. That's the way I wanted to start it. Five balls. Next thing on the agenda is that decal up there.

00 00 40 45 CDR Okay, Ed. The GDC's alined.

00 00 40 47 LMP All right.

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Day 1

00 00 40 50 CMP Okay.

00 00 40 53 LMP Okay, Stu, to P00. Okay. ... PRESS is okay.
O₂ PRESS -

00 00 41 08 CDR Got a full load of RCS fuel for you.

00 00 41 11 CMP That's right. We'll use it to burn. ... quiet.

00 00 41 14 CDR Yes. Let's take it easy on that stuff. Just tap it like it's forever. Son of a bitch! That booster was good, wasn't it?

00 00 41 23 CMP Oh, that's something else!

00 00 41 24 LMP Yes, wasn't it, though? O₂ quantity - -

00 00 41 26 CMP Now that book wants to set there. For Pete - Do you have trouble wanting to go to the - -

00 00 41 30 CDR Yes. I keep floating up in - -

00 00 41 31 LMP Yes. That's - -

00 00 41 32 CMP I do, too. I have a hell of a job holding myself down for shooting the optics.

00 00 41 39 CDR Yes. Boy, those stars are - -

00 00 41 41 LMP Real good.

00 00 41 42 CDR - - crystal clear.

00 00 41 43 LMP Roger. It just has to be ORB RATE.
Sixty-one percent.

00 00 41 50 CDR And I got a real bright one we're aimed for right now.

00 00 41 53 CMP Boy, they're not near as bright in that telescope as they are in the simulator.

00 00 41 56 CDR Well, you're probably not adapted yet.

00 00 41 57 CMP Yes. Yes. I got down here with these floodlights flaring out - -

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00 00 42 00 CMP Yes.

00 00 42 01 CMP After I turned them out, I could see Gienah through it the second time around, so I was adapting. Okay. Looks like all I need to do is the - is to get out the stowage bag - -

00 00 42 14 CDR Got a good horizon out here.

00 00 42 16 CMP Dark?

00 00 42 17 CDR Yes.

00 00 42 18 CMP You can see it, huh?

00 00 42 19 CDR Uh-huh.

00 00 42 21 CMP You need anything else out of me, Ed? How you coming.

00 00 42 24 LMP No. No. I don't need anything else out of you right now, Stu.

00 00 42 28 CDR Well, I'm seeing it ... I'm seeing airglow, Stu. I can see the stars on the other side of it.

00 00 42 32 CMP Well, I tell you what. Why don't I get out those temporary stowage bags, and then I can get the cameras out at our convenience, if that's agreeable.

00 00 42 40 CDR I'm ready for it. You can hand me mine right now.

00 00 42 42 CMP Well, I've got to go down and get it first.

00 00 42 44 CDR Okay. Yes. That's airglow I can see, because I can see the stars underneath it.

00 00 42 51 CMP Man, that booster's something. Couldn't get over the ice. That was something when the ice came off.

00 00 42 54 LMP Yes, that really was.

00 00 42 56 CMP I expected more vibration.

00 00 42 57 CDR I really did, too.

CONFIDENTIAL

Day 1

00 00 42 58 CMP I was really -

00 00 42 59 CDR Yes, I thought that was a real smooth ride. Real smooth. Okay. Let's keep pressing ahead here. Slowly but surely. How you doing, Ed?

00 00 43 15 LMP Okay. Proceeding through my systems check.

00 00 43 20 CMP I got a bag coming up your side there. Ocp! Hey, another one got away - the other two are up behind your head. Can you reach them?

00 00 43 27 LMP Who, me?

00 00 43 28 CMP Yes (laughter).

00 00 43 33 LMP Yes, I'll get them.

00 00 43 34 CMP Hey, good (laughter). Thank you, babe. Guess what I found in there.

00 00 43 39 CDR Oh, those goddamn things are going to be all over the place. You were right what you said about Dell'Osso.

00 00 43 47 CMP Yes. I was needling Gene. I knew they'd done that. I mean, I didn't know it but I sus - Right behind your head are two more of those bags, Al, if you could reach them.

00 00 43 56 CDR Okay. I'll get them. We're probably going to be collecting those patches the rest of the flight.

00 00 44 02 LMP Yes, they're going to be hiding everywhere.

00 00 44 07 CDR Okay, Ed-babe. How about a temporary stowage bag?

00 00 44 11 LMP All right. I'll take one.

00 00 44 12 CDR And, Stu-babe. How about a temporary stowage bag?

00 00 44 14 CMP I'll take one.

00 00 44 19 CDR Take it away. Isn't this great?

00 00 44 23 LMP Isn't this marvelous?

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00 00 44 24 CDR Son of a bitch! I tell you. I've already beat my old record.

00 00 44 37 LMP You beat your old record at insertion! (Laughter)

00 00 44 39 CDR (Laughter) I know it. I was just kidding.

00 00 44 49 LMP Okay.

00 00 44 51 CMP And, in here, you'll have to make sure you get the bottom one snapped, which you have not had to do in the - -

00 00 44 56 LMP 37 5.

00 00 44 57 CMP - - in the CMS.

00 00 44 58 CDR Yes. We've done at your insistence. At your insistence, we have done it, and it's now completed here.

00 00 45 05 CMP Okay.

00 00 45 06 CDR Okay.

00 00 45 07 LMP Let's see. We're on 4-Bravo on the test meter, and it's reading 37.

00 00 45 18 CDR Okay, now what?

00 00 45 21 LMP Okay. I'm ready to do an ECS monitoring check. SUIT PRESSURE - DELTA-P is okay.

00 00 45 30 CDR (Laughter) How are you doing down there, ...?

00 00 45 33 LMP ... O₂ flow ...

00 00 45 34 CMP Five balls. That's the way I wanted to start. The next thing on the agenda is that freaking decal up there. 32.5.

00 00 45 41 CDR Okay. Well, we'll - -

00 00 45 43 CMP We'll work on that one.

00 00 45 44 CDR We'll get to that.

CONFIDENTIAL

Day 1

00 00 45 45 CMP If I start hosing it out, you just say something.

00 00 45 49 CDR I'll say something. Don't you worry. Don't you worry, babe.

00 00 45 53 CMP There's another one.

00 00 45 54 LMP Okay - -

00 00 45 55 CMP Okay.

00 00 45 56 LMP - - We're in the green on REPRESS package.

00 00 45 57 CDR Well, we'll have plenty of them to give out. Yes. We ought to save them for all the hookers in Titusville (laughter).

00 00 46 04 LMP Huh? He said we could either carry them gracefully or otherwise.

00 00 46 09 CDR Yes. No. I'm going to give them to all the hookers in Titusville.

00 00 46 15 CMP Let's see. You might get out your bracket for the camera, if you're out of things to do, Al, and I'll be handling the camera, shortly.

00 00 46 21 CDR Okay. Okeydokey.

00 00 46 25 SC (Whistling)

00 00 46 30 CDR I was going to reach for the G&C Dictionary (laughter).

00 00 46 44 CDR Yes. We got to treat this with a little care because it might just come out of there like everything else does.

00 00 47 10 CDR Stu?

00 00 47 11 CMP Huh?

00 00 47 13 LMP Can you - reach over there and unsnap one of those - unsnap one of those hose lines?

00 00 47 19 CMP Yes. Yes, I certainly can.

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00 00 47 20 CDR Because we don't want to wipe out - Thank you. Thank you. That's the dimension I need.

00 00 47 54 CDR Oh, Jesus. There's one in here, too. There must be one in every frigging volume - stowage that we have.

00 00 48 02 LMP Probably.

00 00 48 03 CMP I think there's going to be.

00 00 48 07 CDR Yes, they knew. God damn, they knew we've got to get into all these things.

00 00 48 14 LMP Okay.

00 00 48 16 CMP Hey, Ed, let me give a presento.

00 00 48 18 LMP Okay. Just 1 sec.

00 00 48 21 CDR Doot doot dum.

00 00 48 24 CMP Here's something - Okay. If you could take a camera. Here's something, you know, we never check in any of the bench checks - that was this 10-millimeter lens won't stay in the - in the cushion. It just floats right on out.

00 00 48 35 CDR ...

00 00 48 36 CMP Yes. Look at that camera.

00 00 48 44 LMP Getting a little leverage here.

00 00 49 45 CMP I'll - I'll drop your seatbands in just a second there.

00 00 49 48 CDR Let her go, babe. Ooooh.

00 00 49 55 LMP Okay. Okay. I'm down in the checklist to where - We've already done to GDC ALINE; we will unstow the sequence camera bracket and the ORDEAL. Have you mounted the ORDEAL box?

00 00 50 10 CDR You haven't told me to, yet.

00 00 50 11 LMP Okay, you can do that as soon as you get your sequence camera under hand there, while I start doing the secondary glycol loop check. SECONDARY - SECONDARY COOL LOOP pump, AC 1. And I heard it come on.

00 00 50 34 CMP Just for on the tape, for DSE purposes, the 10-millimeter lens and 75-millimeter lens will not stay in the cushion.

00 00 50 43 LMP Okay. That's surprising. They were kind of tight before, weren't they?

00 00 50 49 CMP Yes.

00 00 50 51 CDR Okay. What's the last set here on this thing?

00 00 50 54 CMP I guess we've got a gray tape. Don't we - -

00 00 50 55 LMP What, you want it set on it, Al?

00 00 50 56 CDR Yes.

00 00 50 57 LMP Oh.

00 00 50 58 CMP I'll - I'll give it to him. I've got it right here. Okay. You want T8.

00 00 51 02 CDR T8, set.

00 00 51 03 CMP 250th.

00 00 51 06 CDR And a 250th is set.

00 00 51 10 CMP Seven feet.

00 00 51 12 CDR Seven feet is set.

00 00 51 14 CMP And 12 frames per second.

00 00 51 18 CDR And 12 frames per second. Okay.

00 00 51 26 CMP Okay.

00 00 51 34 SC (Whistling)

00 00 51 35 CDR Oh, sunrise, troops.

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00 00 51 38 LMP Oh, mag - -

00 00 51 39 CMP Scn of a bitch!

00 00 51 40 LMP - - Oh, gah!

00 00 51 41 CMP Scn of a bitch! I missed that, and I could've been up there, too.

00 00 51 43 CDR Well, put that thing up.

00 00 51 44 LMP Oh, hurry. It's not too late.

00 00 51 45 CDR Look right here. Look right through the hatch.

00 00 51 47 CMP I can't get the - All I can see is darkness.

00 00 51 49 LMP Well -

00 00 51 52 CDR It's down that way; come up - -

00 00 51 53 CMP Yes, just a second. Here, let me fix my couch.

00 00 51 56 CDR You really ought to get it, babe. Beautiful. It is beautiful!

00 00 51 59 LMP That is really great. Sun comes up like thunder.

TIME SKIP

00 01 20 57 CMP But you know, you get down there, you're not adapted at all. And I'd been looking at the bright Sun; and then, I look out there. I couldn't see a thing in - in this damn thing.

00 01 21 07 LMP Yes, you must admit we ... sinking feeling. Well, I was sure they were gone, because I swore I felt them go.

00 01 21 13 CDR Okay. We're going to talk to the States, here, in a few minutes. What are we going to do, since we're ahead a little bit, what do we do - -

00 01 21 22 CMP Let me get out - while he's - I'll get out check-list here, while you're - -

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00 01 21 27 CDR Kind of look ahead and see what's next.

00 01 21 30 CMP Yes. Yes, we've got all the cameras up.

00 01 21 35 CDR (Laughter) ... Do you want to use this place up here for them?

00 01 21 38 CMP Yes, that'd be good for it.

00 01 21 39 CDR Okay. As a matter of fact, those rascals aren't bad.

00 01 21 45 CMP You know, those are really good work on those ...

00 01 21 48 CDR Good workmanship, yes.

00 01 21 54 CMP Shouldn't have that on the tape either.

00 01 21 55 CDR What does that say down there? Rock of Gibraltar? Take a closer look at that.

00 01 22 05 CMP You did do the SCS attitude reference check?

00 01 22 07 LMP Yes, I got it written down.

00 01 22 09 CMP Okay. Now, the next thing we got coming up is the docking probe; and then, we get a TLI pad; and then, we start into TLI PREP, 1 plus ...

00 01 22 18 LMP Yes. I've got our TV camera running over here.

00 01 22 23 CMP Do you have the - an image on the monitor?

00 01 22 25 LMP Uh-huh. Got the corner of the world poking out there.

00 01 22 27 CMP You want to put the monitor up here and can we -

00 01 22 43 CDR ... start to feel a little hungry.

00 01 22 46 LMP I am, too.

00 01 22 47 CDR I'm glad we decided to put those sandwiches in there.

00 01 22 49 CMP Wonder what we got.

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00 01 22 52 CDR Well, after all, it is 5:25, Cape time.

00 01 22 57 CMP I must admit I got a tinge of glumness there when they called that hold. I was really primed for 3:23.

00 01 23 05 LMP Yes, I was, too. I agree.

00 01 23 07 CDR I can't really blame them though.

00 01 23 10 CMP No, they got a - You know, you get bit once, you - you can't afford to - There's a lot of water down there. Ought to be able to ... coming up here.

00 01 23 23 CDR Well, are we going to have any lunch? What do you want?

00 01 23 26 LMP 28.

00 01 23 28 CMP ... 20 degrees of angle.

00 01 23 41 SC (Whistling)

00 01 23 45 CDR Well, let's see, ... get a little time here. Let's take a look at this COAS. Put it on the horizon and see what it reads.

00 01 23 54 LMP (Groan)

00 01 24 05 LMP Pull this out of here.

00 01 24 08 CMP Yes, just push me around if I'm in your way.

00 01 24 09 CDR ... 14, 14. 14 and a half. Whoops!

00 01 24 25 LMP Would you like to see out my window, guys?

00 01 24 29 CMP Look at that. Good picture.

00 01 24 32 LMP Now, if you want to hold it, let me see if I can peak it up here. It drifted away from me is the reason I - f/44, brighten it up. Okay. I think f/44 is what I want.

00 01 24 51 CDR Pretty good.

00 01 24 53 SC (Cough)

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00 01 24 58 CDR ... resolution, haven't we?

00 01 24 59 LMP Yes.

00 01 25 00 CDR At least the black-and-white does.

00 01 25 04 LMP I'm looking to the north, aren't I - as we're going along?

00 01 25 08 CDR You better be.

00 01 25 10 CMP You - you - straight out that window is not too far off the track, I mean, you know - -

00 01 25 17 LMP Straight out this window?

00 01 25 19 CMP Yes, you know - -

00 01 25 20 LMP Oh -

00 01 25 21 CMP You can almost see the nadir out that window. Oh, - you're, - oh, - well, I didn't realize you were down on that window.

00 01 25 32 LMP Well, I was looking out - -

00 01 25 33 CMP You're - both - -

00 01 25 34 LMP - - of both of them.

00 01 25 35 CMP - - windows on your side.

00 01 25 36 LMP Yes, out this one ...

00 01 25 38 CDR You know, I can't believe how clean that this spacecraft is.

00 01 25 40 CMP I haven't seen a single bolt - -

00 01 25 42 LMP Okay. Let me have that a minute, Stu.

00 01 25 44 CDR ...

00 01 25 45 CMP The only thing cluttering it up are the backup patches.

00 01 25 47 CDR ...

CONFIDENTIAL

00 01 25 49 LMP Hold the cabin just a second, Stu. Let me see if I can anchor this monitor any better.

00 01 25 53 CMP Okay. Yes, it - it's set up on that Velcro. It - it should seat where you - -

00 01 25 57 LMP Well, it seems to be. I keep kicking it off. Here, let me -

00 01 26 01 CMP Need a little more cord there.

00 01 26 03 LMP That's all I - that's all I need is a little more cord.

00 01 26 07 CMP Yes. In lunar orbit, I'm going to be swamped with cord and cable.

00 01 26 13 LMP What's that?

00 01 26 15 CDR There's more badges (laughter).

00 01 26 17 LMP Okay, I got it.

00 01 26 18 CDR I'll get it out of the way ... I'm over here. ... beep, beep, beep all over the place.

00 01 26 33 CMP He who laughs last.

00 01 26 36 CDR Well I'm - even so, I'm hell of a lot happier that we're flying and looking at their patches, rather than the other way around.

00 01 26 44 CMP Well, that's what I meant by laughing last (laughter).

00 01 26 51 CMP Yes. It's really a strange feeling. You know, sitting here looking out, it's hard to tell whether you're standing on your head, or - -

00 01 27 05 LMP Yes, I'm just - I'm still just a bit disoriented.

00 01 27 08 CDR Are you?

00 01 27 09 LMP Well, I'm not when I look out the window, but I'm still - I'm a little bit disoriented in direction.

CONFIDENTIAL

Day 1

00 01 27 13 CDR Well, I think the only aloof feeling you have is just the fact that you're stuffy ... feeling in your head.

00 01 27 20 LMP Yes.

00 01 27 24 CMP ... if I thought you could ... things looking so ...

00 01 27 42 CMP What you got going for you there, Leader?

00 01 27 46 CDR Huh?

00 01 27 47 CMP What you got going for you there?

00 01 27 48 CDR Oh, I was just - you know - looking around; see if I can get disoriented. ...

00 01 27 51 CMP Oh. It sounds like - -

00 01 27 54 CDR Up is up, and down is down.

00 01 28 03 CDR No sweat!

00 01 28 14 CMP Sure am anxious to get this thing burning again.

00 01 28 16 CDR Yes. Yes. I tell you, I'd be a little bit nervous about the, the way that baby put us in orbit!

00 01 28 27 CMP Yes. How's our tanks going? I guess we ought to take a look at those over here.

00 01 28 30 CDR 35 - 35, oxidizer; and 20, fuel. Right where it was when she cut off.

00 01 28 44 LMP Well, I guess I'd better put this back until we get to Houston, here, in a minute.

00 01 28 48 CMP Well, we're 01:28:46, now. My checklist says US LOS - Oh, okay. LOS, sorry about that. ...

00 01 29 01 CDR That shouldn't change.

00 01 29 03 CMP Yes. We ought to have them.

00 01 29 06 CDR Ought to be fairly close.

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00 01 29 12 CMP There, we just - we just got a wiggle on - yes - -

00 01 29 21 LMP Here it comes.

00 01 29 29 CMP ... It's not worth shit.

00 01 29 32 LMP No. It's not very good.

00 01 29 33 CMP There, it's coming up.

00 01 29 34 LMP Okay.

00 01 29 38 LMP Hello, Houston; Apollo 14. How do you read?

00 01 29 52 CMP ... coastline ... I - I can see it.

00 01 29 55 CDR Ah, there it is. Yes. See? That's Baja.

00 01 29 58 LMP Yes.

00 01 29 59 CMP Yes?

00 01 30 00 LMP Hello, Houston; Apollo 14. How do you read?

00 01 30 07 CDR Where is it? I can't see it.

00 01 30 09 CMP I - I'm not sure it is - I can't - I've got a - -

00 01 53 23 CC On your P15, we show that you loaded the wrong seconds figure for time base 6. Will you check that?

00 01 53 42 CMP Thank you, Gordon. Good call.

00 01 53 52 CDR 1805100. There you are. Okay. Okay, now I'll discard - this plus 2.5 degrees in depth?

00 01 54 12 CMP That's right. It goes to 20.5.

00 01 54 15 CDR 20.5. And this is going to become 12.5.

00 01 54 23 CMP 12.5.

00 01 54 28 CDR And this, then, becomes 8.5 - -

00 01 54 30 CC 14, Houston.

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00 01 54 32 CDR Go ahead.

00 01 54 34 CC For that time to take, you're going to have to reselect P15.

00 01 54 40 CMP Roger. I - I did, Gordon. We'll run through it again.

00 01 54 44 CC Roger.

00 01 54 47 LMP Okay. We need to be pressing along here.

00 01 54 49 CMP Okay, press.

00 01 54 50 LMP ... set DELTA-V_C.

00 01 54 53 CDR Just a second. If you want to note that during the venting of the DELTA-V test - And, under the second vent, that was minus 99.5. Okay.

00 01 55 05 CMP Minus 95.5.

00 01 55 06 CDR 99.5.

00 01 55 07 CMP Got it.

00 01 55 09 CDR Okay, I'm setting -

00 01 55 15 CMP Two hours 18 and 51 seconds. ... 37.

00 01 55 33 CDR (Whistling)

00 01 55 34 CMP I need to get a hack on that 2:18:51 - -

00 01 55 38 LMP 2:18:51.

00 01 55 39 CMP - - Okay, it's coming up toward 51 - Should be coming toward 55:51; that would be 5 - 23 minutes. Okay. 1 -

00 01 55 53 CMP HACK. Okay?

00 01 55 55 LMP All right.

00 01 56 12 CDR (Whistling)

00 01 56 17 LMP Okay, your number - have you got it?

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00 01 56 20 CMP 103 something. 10363.0.

00 01 56 24 CDR Okay.

00 01 56 33 LMP I keep being afraid, like in the simulator, to let go of my book; it's going to fall down on the - -

00 01 56 39 CMP Yes, ... That's what you get for not paying attention to what you're doing.

00 01 56 44 LMP Fight.

00 01 56 45 CMP ... around.

00 01 56 49 LMP (Cough)

00 01 56 52 CDR Okay, DELTA-V_C, 10363.0 - -

00 01 56 57 LMP 63.0. That's correct.

00 01 56 58 CDR Stand by, DELTA-V. Okay?

00 01 57 00 LMP Okay.

00 01 57 03 CDR Now, GDC ALINE; okay.

00 01 57 07 LMP That's the next thing. Now first, EMS FUNCTION, DELTA-V.

00 01 57 10 CDR Okay, so it is.

00 01 57 12 LMP GDC ALINE.

00 01 57 13 CDR Okay. In work, my friend.

00 01 57 19 LMP And, Stu, check your DAP, if you haven't already.

00 01 57 25 CMP All right, ... - -

00 01 57 26 LMP VERB 48.

00 01 57 33 CMP Okay, I have 31102.

00 01 57 36 CDR Okay, zero, all 1's.

00 01 57 38 CMP Zero and all 1's.

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00 01 57 40 LMP Call VERB 83.

00 01 58 07 CMP ... back there on the - There.

00 01 58 10 CDR ...

00 01 58 15 LMP Okay. We're setting our ORDEAL at 100/EARTH.

00 01 58 20 CDR I want to be sure that GDC is right on the money. Within a quarter of a degree. Okay, that's close enough. Okay. GDC's alined, Ed.

00 01 58 33 LMP Okay. Set ORDEAL to 100/EARTH.

00 01 58 37 CDR Okay. We want EARTH power. We want 100. That's what we have. Okay.

00 01 58 47 LMP And it says we can arm the pyros here.

00 01 58 51 CDR Is that time correlated at all or is the - -

00 01 58 53 LMP Yes, it says here that we have - It's right after LOS at Carnarvon at 1:55, and we're 3 minutes - 4 minutes after that. ...

00 01 59 00 CDR Canary time?

00 01 59 01 LMP I mean Canary's time.

00 01 59 04 CDR All righty.

00 01 59 06 LMP SECS PYRO, two - SECS PYRO ARM, two, on (up).

00 01 59 11 CDR Okay, all I do with the ORDEAL at this time is set EARTH power in 100 and hold that.

00 01 59 15 LMP That's right.

00 01 59 16 CDR That's where it is. Okay.

00 01 59 17 CMP Why don't you slew it in - Well, see, you call a VERB 83. It says you set ORDEAL, so -

00 01 59 22 LMP PYRO A, on; PYRO B - -

00 01 59 24 CDR Ch, okay.

00 01 59 25 LMP - - on.

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00 01 59 26 CMP Yes, you really want to set the ORDEAL up on VERB 83.

00 01 59 28 CDR Okay. Okay, so we'll select ball 1 to ORB RATE and we will hold it back; then we'll slew up to 1.0. ... Okay, ORDEAL's running at 1.5. Operating SLOW, EARTH/100. Okay.

00 02 00 04 LMP Okay. And standing by for pyro arm.

00 02 00 08 CDR The pyros have been armed.

00 02 00 10 LMP Okay, TRANSLATIONAL CONTROL POWER, on.

00 02 00 12 CDR It's on.

00 02 00 13 LMP ROTATIONAL CONTROL POWER, NORMAL, two, AC/DC, verify.

00 02 00 17 CDR Okay. NORMAL, two, AC/DC, verify.

00 02 00 21 LMP ROT CONTROL POWER DIRECT, two, MAIN A/MAIN B.

00 02 00 24 CDR DIRECT 1, MAIN A/MAIN B; DIRECT 2, MAIN A/MAIN B.

00 02 00 28 LMP LAUNCH VEHICLE INDICATOR, GPI - S-II/S-IVB, verify.

00 02 00 32 CDR Okay. GPI is in S-II/S-IVB. And that's - The pressures are real quiet down here.

00 02 00 40 LMP Okay.

00 02 00 42 CDR We've got to remember to watch those babies after shutdown, too.

00 02 00 47 LMP Okay. Circuit breaker DIRECT ULLAGE, two, closed.

00 02 00 49 CDR Okay, two ULLAGE breakers going closed.

00 02 00 52 LMP And I'm cycling the cryo fans.

00 02 00 54 CDR Okay, ...

00 02 00 57 CMP ... gone to AUTO?

00 02 00 58 LMP Huh?

00 02 00 59 CMP ...

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00 02 01 01 LMP No.

00 02 01 02 CMP No. ...

00 02 01 07 LMP Set the DET at 51.

00 02 01 08 CDR Okay. ... see how close that baby is before we -
...

00 02 01 14 CMP What have you got ...

00 02 01 19 CDR ... 1 minute. 17, 18, 19, 20. Hey, it stayed
right in there, didn't it? Two hours; no appreci-
able error. ... ENTER. RESET.

00 02 01 45 CDR DET is set at 51:00.

00 02 01 48 LMP Okay. And Stu has lunar time base 6.

00 02 01 53 CMP Yes, I was looking at NOUN 20 there.

00 02 01 56 LMP Okay. Verify you've done that.

00 02 01 59 CDR Okay, CONTROL is coming up. It's locked.

00 02 02 04 LMP Time base 6 is at 2:18. And we have 16 minutes to
stand by.

00 02 02 09 CMP ... up here.

00 02 02 11 LMP Okay.

00 02 02 12 CMP Stand by, in case we just have to ...

00 02 02 17 CDR No, God damn it! That's the way we play it.

00 02 02 21 CMP Well, standing by.

00 02 02 22 CDR Okay.

00 02 02 24 LMP That's what the damn thing's there for.

00 02 02 25 CMP We want to think positive.

00 02 02 27 CDR Who's supposed to do that?

00 02 02 28 CMP Think positive and prepare for the worst.

~~CONFIDENTIAL~~

00 02 02 30 CDR Okay. Tell me, how - Where do we stand now with respect to sunlight. We shouldn't get sunlight prior to - -

00 02 02 37 LMP Sunrise is - -

00 02 02 38 CMP 2:21.

00 02 02 39 LMP Well, 2:21 on the old time line.

00 02 02 42 CMP It's going to be earlier.

00 02 02 44 LMP Yes, a little bit earlier.

00 02 02 45 CMP It's going to be earlier because sunset was a little early. We have three - three-quarters of an hour - 15 degrees ...

00 02 03 04 CDR Did we really get off at 03? Is that about what it was?

00 02 03 07 LMP Yes. See - It looks like they programed us for 40-minutes-late lift-off and that's what we have.

00 02 03 13 CDR Exactly 40, huh?

00 02 03 14 LMP Uh-huh.

00 02 03 15 CDR Good show.

00 02 03 16 CMP Temperature in the ... 52.

00 02 03 20 CDR You know, I been getting light flashes with my eyes open.

00 02 03 23 LMP (Laughter)

00 02 03 24 CMP I think you should when you see lightning down there. Ed and I saw some when you were copying that TLI pad.

00 02 03 30 CDR Is that what it is?

00 02 03 31 LMP Yes.

00 02 03 32 CDR Okay. I see a forest fire down there.

00 02 03 38 LMP Do you?

CONFIDENTIAL

Day 1

00 02 03 39 CMP ... were over?

00 02 03 41 LMP We were over Africa at the start - -

00 02 03 42 CDR We're over deepest, darkest Africa.

00 02 03 46 CMP Say hello to all the troops at Mozambique. Hello, troops in Mozambique.

00 02 03 54 LMP Okay - -

00 02 03 55 CDR ...

00 02 03 59 LMP ... reset the -

00 02 04 15 CMP Damn, except for the - the dynamics during launch, it seemed like a SIM, you know it?

00 02 04 21 CDR Uh-huh.

00 02 04 22 CMP Sitting here, quiet. The visual's a little better.

00 02 05 16 CDR This seems to be a light flashing by. ...

00 02 05 35 CDR (Humming - "Give My Regards to Broadway")

00 02 06 48 CDR You shouldn't be rolling.

00 02 06 49 CMP Huh?

00 02 06 50 CDR You shouldn't be rolling.

00 02 06 58 CMP Now, I see something to do here.

00 02 07 00 LMP Yes, I'm going to go back - and make sure we haven't missed a single thing.

00 02 07 06 CMP I got the G&N Dictionary down here. All out, ready to read.

00 02 07 13 LMP Let's just be sure we haven't missed anything on the checklist.

00 02 07 22 CMP Did they get us started on the ... on that LOS?

00 02 07 27 LMP Yes.

CONFIDENTIAL

00 02 07 29 CDR Let's see. We want ... 20 degrees ... and we're making -

00 02 07 39 CMP No, 10 degrees.

00 02 07 41 CDR Yes. Yes, 10. And we're making 4 degrees a minute. So, it should change our AOS time - I mean our sunrise time to 2 and a half minutes ...

00 02 07 53 CMP ...

00 02 07 54 CDR And it should be earlier. Sunset should be earlier and sunrise should be earlier. Well, what does that work out for sunrise?

00 02 08 05 CMP 02:19.

00 02 08 13 CDR Okay. ... looking at our fuel pressure - I mean, oxidizer pressure should stay at 36 - 35, and fuel at 20.

00 02 08 32 LMP Okay, Al, do you want to check your DAC and make sure its settings are it - on it like you want it, to get it done. T8 at 250th.

00 02 08 43 CDR Okay. Let me check it for you. I've got a T8, and it's focused at 7 feet. I've got a 250th.

00 02 08 56 LMP Okay. Twelve frames - -

00 02 08 58 CDR Twelve frames a second.

00 02 08 59 LMP Magazine A.

00 02 09 01 CDR Magazine A.

00 02 09 02 LMP Got an 18-millimeter lens with the right-angle mirror on it.

00 02 09 07 CMP Exactly.

00 02 09 08 LMP Okay. I'm going to set up the Hasselblad then.

00 02 09 13 CMP Okay. We're 9 and a half minutes from time base 6.

00 02 09 18 LMP Okay.

CONFIDENTIAL

Day 1

00 02 09 56 CDR Yes, I'm glad you called that, Ed. It shows you what you can do. I had apparently knocked that thing to 24 frames per second.

00 02 10 01 LMP Really?

00 02 10 02 CDR Yes. It's now sitting at 12.

00 02 10 34 CDR Okay. Let's, just for the hell of it, take some pictures of that - top of that booster anyway, huh?

00 02 10 48 LMP Yes, I'm going to try to. You mean with the Hasselblad or what?

00 02 10 51 CMP Yes, the Hasselblad.

00 02 10 52 CDR Yes, with the Hasselblad. We're supposed to do it only, you know, provided it looks anomalous to us, but I think we ought to just go ahead and take a few pictures - -

00 02 11 00 LMP Yes, I think we ought to - -

00 02 11 01 CMP Oh, yes. I think we ought to take a couple as we come off. And then, when we roll and it comes in the hatch window, I think you ought to take a couple out of the hatch window.

00 02 11 11 CDR Have you got a range sight on the camera?

00 02 11 13 LMP No, not right now. Wouldn't hurt if we did, but we don't.

00 02 11 19 CMP Yes, I got myself all strapped in now.

00 02 11 28 LMP Okay. ASA 64.

00 02 11 41 CDR Okay. Time base 6 for a start, and then, we'll have sunrise. And then, we'll do all those good things.

00 02 11 49 CMP Then we'll get AOS from Carnarvon. We'll get a GO for TLI, and we'll burn the son of a gun.

00 02 12 01 LMP Beautiful.

00 02 12 10 CMP Some ride.

CONFIDENTIAL

00 02 12 12 CDR ... I have to get closer. ...

00 02 12 14 CMP Some ride.

00 02 12 16 CMP There was no doubt in your mind of lift-off. I was a little surprised at the level of the vibration prior to lift-off though. I'd been led to believe it was probably worse. Maybe they're strapping us in tighter nowadays.

00 02 12 32 CDR I didn't have any trouble with communications or anything.

00 02 12 35 CMP Oh, it was beautiful all the way. Boy, that BPC goes, doesn't it? That tower, son of a bitch moves out. I didn't even notice the switches being hard (laughter). I didn't figure I would.

00 02 12 56 CDR (Yawn)

00 02 12 58 CMP I didn't figure I would. Man, it was beautiful! All the checks right on the mark. Played her right like the SIM. ... just like the simulator.

00 02 13 12 LMP I guess, in order to make sure we don't screw that up, I guess I'd better pull that dark slide out right now. Right there.

00 02 13 23 CMP ... yet.

00 02 13 27 LMP Yes, but I don't want to - be ready to take a picture and miss a picture because of it.

00 02 13 32 CDR Anybody want any water?

00 02 13 34 CMP Yes. I'll take a slug of water.

00 02 13 41 CDR ... a good place to leave that baby ...

00 02 13 46 LMP How long before time base 6?

00 02 13 48 CDR Oh, about 5 minutes.

00 02 13 51 LMP I'm getting kind of hungry. I'm going to have to watch my weight. I'm going to really slurp it up at the table tonight - -

00 02 14 01 CMP ... up in there.

CONFIDENTIAL

Day 1

00 02 14 11 CDR Well, ... be back ...

00 02 14 21 CMP Pretty tasty water.

00 02 14 24 LMP Well, there goes the monitor. Watch out for the trim.

00 02 14 38 CDR I tell you, this weightlessness is really great, isn't it?

00 02 14 41 LMP Yes, I'll enjoy it.

00 02 14 43 CDR Zero g. Fantastic!

00 02 14 49 LMP I want to see the stars out there.

00 02 14 51 CDR I don't feel any - any more stuffy than I did this morning.

00 02 14 55 CMP I'm - I'm kind of surprised at that, too. I - I think Al Bean made the comment that everybody's face looked puffed up.

00 02 15 02 CDR Yes?

00 02 15 03 CMP Your face doesn't look puffed up to me, particularly.

00 02 15 07 CDR I'm sure there is some adjustment - -

00 02 15 09 CMP Yes.

00 02 15 10 CDR - - you adjust to the - You know, the old - your cardiovascular - relaxes. ...

00 02 15 16 LMP I just feel great, personally.

00 02 15 19 CDR Well, hell, after the goddamn launch like that, who couldn't feel great?

00 02 15 22 CMP Oh, I've got a little stuffiness in my head. I -

00 02 15 26 CDR Yes.

00 02 15 27 CMP You know, it sort of feels like you're - maybe when you're pulling 1 and a half or 2g's with a - with a cold.

00 02 15 35 LMP Yes.

CONFIDENTIAL

00 02 15 36 CMP It sort of feels just like it.

00 02 16 05 LMP I can't help but feel I'm laying on my back.

00 02 16 13 CMP I sort of feel like I'm laying headdown somewhere. Maybe that's because of the -

00 02 16 18 LMP Stuffiness?

00 02 16 19 CMP - stuffiness in my head.

00 02 16 22 CDR Yes, feet slightly elevated.

00 02 16 27 CDR Like resting on the situp board at - -

00 02 16 29 LMP Yes.

00 02 16 30 CDR - - high angle.

00 02 16 31 LMP Yes.

00 02 16 37 CC Apollo, Houston. This is - Apollo 14, this is Houston through ARIA 4. How do you read?

00 02 16 43 CMP I'll be damned!

00 02 16 45 LMP Houston, this is Apollo 14. Loud and clear. How me?

00 02 16 48 CC Roger. You're readable; a little bit in the background noise, but loud and readable.

00 02 16 56 LMP Roger, Houston.

00 02 16 58 CDR When did we say it was going to be?

00 02 17 02 LMP What's that?

00 02 17 04 CDR What was that figure, Stu-babe?

00 02 17 05 CMP We said - 19:16.

00 02 17 07 CDR 19:16. Okay. Okay.

00 02 17 14 CMP Okay, Houston; 14. How do you read now?

00 02 17 19 CC Apollo 14, Houston. You're readable, Stu. Go ahead.

CONFIDENTIAL

Day 1

00 02 17 24 CMP Okay. I was just checking the comm here. Gee, you're just beautiful; the ARIA is really putting out for us.

00 02 17 30 CC Roger. I guess this is the best ever for ARIA.

00 02 17 34 CDR Eighty seconds to time base 6 start, troops.

00 02 17 38 LMP Okay.

00 02 17 45 LMP LAUNCH VEHICLE GUIDANCE to IU, verify.

00 02 17 48 CDR LAUNCH VEHICLE GUIDANCE to IU. Never has moved.

00 02 17 51 LMP Okay.

00 02 17 53 CDR Although we were ready for it - -

00 02 17 54 LMP Standing by for the UPLINK ACTIVITY light.

00 02 17 59 CDR Sixty-five seconds.

00 02 18 08 SC (Humming)

00 02 18 09 CDR I want you to mark when that Sun comes over the horizon.

00 02 18 11 LMP All right. You want to not look at it?

00 02 18 16 CDR Well, it's right in my window.

00 02 18 17 LMP Yes.

00 02 18 21 CDR Thirty seconds to start of time base 6.

00 02 18 23 LMP Okay.

00 02 18 40 CDR Okay.

00 02 18 46 CMP We get an UPLINK ACTIVITY light and an S-II SEP light.

00 02 18 56 CDR Okay. We have an S-II SEP light.

00 02 19 00 CMP About a second late.

CONFIDENTIAL

00 02 19 01 CDR Yes, it looked like it was a little late, didn't it? When that light goes out, I'm going to start my timer.

00 02 19 09 LMP Okay. Count down to the Sun.

00 02 19 26 CMP Down to 5-second count.

00 02 19 34 CDR Okay. The light's out. Timer starting.

00 02 19 36 LMP And counting. Watch the sunrise in your eye, Al.

00 02 19 38 CDR Okay. Tank pressure's 35 and 20. That looks good.

00 02 19 44 LMP Okay. Verify SPACECRAFT CONTROL, SCS.

00 02 19 47 CDR Okay. SCS.

00 02 19 50 LMP And monitor your tank pressures.

00 02 19 51 CDR Okay. Is the Sun on time?

00 02 19 59 LMP The Sun is - -

00 02 20 00 CMP Pretty - pretty damn close.

00 02 20 01 LMP It's just - just a little early.

00 02 20 03 CMP No, it isn't - -

00 02 20 04 LMP It was early on - -

00 02 20 05 CMP - - not by our time.

00 02 20 06 LMP Okay.

00 02 20 07 CMP Our 19:16.

00 02 20 08 LMP Right.

00 02 20 18 LMP Okay. MASTER ALARM, O₂ FLOW HI.

00 02 20 32 LMP You have a - DIRECT O₂ valve?

00 02 20 37 CDR It's off.

00 02 20 39 CMP Cabin is good.

~~CONFIDENTIAL~~

Day 1

00 02 20 42 CDR Okay - -

00 02 20 43 LMP It's holding inside the cabin. Forgot to trigger it. I'll have - Well, hell, it's down below the GO mark. It can't be.

00 02 20 57 CMP What?

00 02 20 58 LMP It's just a transient. Had to be.

00 02 20 59 CMP Yes.

00 02 21 00 CMP 3.9.

00 02 21 08 CMP Turn your suit regulator over there. Just turn it - it's on BOTH. Turn it up to 1 -

00 02 21 16 CDR Okay.

00 02 21 18 CMP Okay, suit's on 1?

00 02 21 19 CDR Yes.

00 02 21 20 CMP Okay. Turn it on 2.

00 02 21 23 CDR Okay, it's on 2.

00 02 21 25 CMP Okay.

00 02 21 26 CDR Okay.

00 02 21 27 CC Apollo 14, Houston. Over.

00 02 21 28 LMP Go ahead.

00 02 21 31 CC Roger; we missed, if you did call time base 6 starting. I would like to know how the tank pressures looked. Over.

00 02 21 38 CDR Okay, it looks to us like time base started within 1 second of nominal time, and the oxidizer tank is currently sitting - -

00 02 21 45 CMP Oh, wait a minute.

00 02 21 47 CDR - - quietly at - 37, and the fuel tank is currently sitting quietly at 26.

~~CONFIDENTIAL~~

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00 02 21 53 LMP You're going to get UP TLM - -

00 02 21 54 CC Roger, Al.

00 02 21 56 LMP - - We command BLOCK on both of them.

00 02 21 58 CMP BLOCK, BLOCK.

00 02 22 00 LMP Okay. RHC number 2, armed.

00 02 22 04 CMP Okay. Verify.

00 02 22 05 LMP ORDEAL, 300/LUNAR.

00 02 22 08 CDR Verify.

00 02 22 10 LMP FDAI - ORDEAL: FDAI 1, ORB RATE; 2, INERTIAL.

00 02 22 14 CDR Okay; 1 is ORB RATE, 2 is INERTIAL.

00 02 22 18 LMP And we're standing by to slew to 20.5 at - at 57.

00 02 22 23 CDR We're a little bit ahead of that, in fact. 54, 55 -

00 02 22 42 CDR Eight degrees - would be 28 and a half at 55.

00 02 22 46 LMP Okay.

00 02 22 48 CMP Yes, you know we did that in the SIM - got fouled up on that, too.

00 02 22 53 CDR With the venting?

00 02 22 54 CMP Is the tape recorder barber pole? Okay. I guess they're not getting data up right now. We're still through the ARIA. I guess we haven't got - -

00 02 23 03 LMP No, we've lost the LOS on the ARIA.

00 02 23 08 CMP And I'll bet what happens is, if the suit accumulator cycles, it might kick that over to the - -

00 02 23 12 LMP Yes.

00 02 23 13 CMP - - high O₂.

00 02 23 43 CDR Okay. I think I've got my ORB RATE ball set up where we can check it again in another minute.

~~CONFIDENTIAL~~

CONFIDENTIAL

Tank pressures are reading 40. We're out of comm with them now, are we?

00 02 23 54 LMP Yes.

00 02 23 56 CMP We should have them again here in about 2 minutes.

00 02 24 00 CDR Tank pressures look good. Oxidizer, 39; fuel's coming up to 40. Beautiful, S-IVB. At 56 minutes, we should be at 24 and a half.

00 02 24 25 CMP That Sun in your eye?

00 02 24 27 LMP Huh?

00 02 24 28 CMP I thought that Sun was shining - -

00 02 24 31 CC ...

00 02 24 34 CDR My ORB RATE ball is exactly right.

00 02 24 36 CC Roger; copy.

00 02 24 37 CDR Half a degree.

00 02 24 39 CMP Okay, Houston; 14.

00 02 24 45 CDR Did you notice that that VHF volume being full up distorted the - -

00 02 24 49 LMP Yes.

00 02 24 50 CDR - - his VHF?

00 02 24 51 LMP Uh-huh.

00 02 24 52 CDR I couldn't understand why he sounded so garbled there.

00 02 24 55 CMP You aren't kidding.

00 02 24 56 LMP You ain't the only one.

00 02 24 57 CDR Okay. Coming up on 57. It should be 20.5.

00 02 25 02 LMP That's affirm.

00 02 25 03 CDR That's right: 57 and 20.5.

CONFIDENTIAL

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00 02 25 18 CDR It's now 21 ... right about there. Yes, look at that mother.

00 02 25 27 LMP What's our time, Al?

00 02 25 30 CDR 55, 56.

00 02 25 33 LMP Pardon?

00 02 25 34 CDR Okay. We are 57 minutes now and we're 20.5.

00 02 25 37 LMP Okay. ORDEAL MODE, HOLD/FAST.

00 02 25 39 CDR It is HOLD/FAST.

00 02 25 40 LMP And call P47.

00 02 25 50 CMP Okay, Houston; 14. How do you read us?

00 02 25 54 CC 14, this is Houston. Roger - -

00 02 27 09 LMP S-II SEP light - -

00 02 27 10 CDR It's on, right on the money.

00 02 27 11 LMP - - on, 58:36.

00 02 27 14 CDR Okay. Should be starting ullage now.

00 02 27 24 LMP I don't feel it or we'd be floating down.

00 02 27 29 CMP Doesn't start until 58. ...

00 02 27 33 CDR Don't see any counts, do you?

00 02 27 34 CMP Wasn't that a 2 a minute ago?

00 02 27 35 LMP Yes.

00 02 27 36 CDR It probably isn't going to be as a 1. Now it's a zero.

00 02 27 40 LMP It's counting us down.

00 02 27 41 CDR Yes. It's counting ...

00 02 27 43 LMP Okay. At 59 minutes, Al, you should have 12 50 - 12.5. Is it after 59?

~~CONFIDENTIAL~~

CONFIDENTIAL

00 02 27 54 CDR 59:19.

00 02 27 56 LMP Okay.

00 02 28 17 CDR S-II SEP light out on time.

00 02 28 18 LMP Okay, T_{ig} minus 18.

00 02 28 29 CDR Okay. Right on the money, 8.5. OPERATE/SLOW.

00 02 28 35 LMP There she goes.

00 02 28 36 CDR We have IGNITION.

00 02 28 39 CMP How about that?

00 02 28 40 CDR Very nice.

00 02 28 41 CC Okay. Roger.

00 02 28 42 LMP Nice start.

00 02 28 43 CMP Smooth start and steering's good.

00 02 28 45 LMP 2:28 - -

00 02 28 47 CC We really show good thrust on the S-IVB.

00 02 28 49 CMP Unbalance ...

00 02 28 52 CDR That thrust is ... - -

00 02 28 54 CMP Yes, it's pitch down. Yes.

00 02 28 55 CDR It's all right.

00 02 28 58 CMP It knows what it's doing. 28, 29, 30. Okay, at 30, it should come on 129 - and it's very close.

00 02 29 11 CDR Yes, Michael Wash [?] gave us the right numbers. We're right on cue.

00 02 29 18 CMP At 1 minute, it should be at 120 - 128.

00 02 29 27 CDR Slight vibration, coming along very smooth.

00 02 29 35 CMP Okay. 128, on the money. A little low in altitude.

CONFIDENTIAL

00 02 29 54 CMP All those g's make me hungry.

00 02 30 05 CDR 2430.

00 02 30 08 CMP 127.

00 02 30 10 CDR All those g's! We've got 0.5.

00 02 30 15 LMP How much is it?

00 02 30 16 CMP Yes, but it got my stomach to realizing I was hungry.

00 02 30 22 LMP O₂ FLOW HI.

00 02 30 23 CMP Ignore it.

00 02 30 24 CDR Ignore it.

00 02 30 25 CMP Okay, tank pressures are still good.

00 02 30 35 CMP Two minutes, 126.

00 02 30 40 CDR Houston, tank pressures are steady at 40 and 30.

00 02 30 44 CC 14, Houston. Roger.

00 02 30 53 LMP What was that?

00 02 30 54 CMP Must have been a PU-use shift.

00 02 30 55 CDR/LMP Yes.

00 02 30 56 CMP Man, that's like cutting in the AB.

00 02 30 57 CDR Yes. Seven-tenths of a g now.

00 02 31 04 LMP Yes, it sure is. Got the monitor right in my lap.

00 02 31 10 CMP A little low on my card.

00 02 31 14 CDR Okay.

00 02 31 19 CMP But the angles are good. Maybe the buildup data isn't too striking, you know.

00 02 31 25 CDR Keep analyzing. Here comes KEY RELEASE. KEY RELEASE. KEY RELEASE, Stu.

CONFIDENTIAL

00 02 31 30 CMP No, that's - that's just to go back to now.

00 02 31 34 CDR I ...

00 02 31 35 CMP Okay. Yes, I've got a 62 over an 80.

00 02 31 40 CDR Oh, okay.

00 02 31 41 CMP Okay. Three minutes, 112 - We're 109, 767.

00 02 31 46 CDR Okay.

00 02 31 48 CMP She's coming up.

00 02 31 49 CDR Okay.

00 02 32 02 CDR It does change vibration modes with the mass, doesn't it?

00 02 32 05 CMP Okay. There's 3:30.

00 02 32 06 LMP Okay.

00 02 32 08 CMP 117 - We're 114, 1050, 30. It's a little - running a little low.

00 02 32 18 CMP Come on, baby.

00 02 32 19 LMP Okay, coming up on 4 minutes.

00 02 32 23 CMP Do your thing.

00 02 32 36 CMP Okay, 120.

00 02 32 41 CDR We only pitching about 1 degree right now.

00 02 32 50 CDR Pulling one g, troops.

00 02 32 51 CMP Okay.

00 02 32 53 LMP Feels kind of heavy, doesn't it?

00 02 32 54 CMP Yes (laughter).

00 02 32 55 LMP Yes.

00 02 33 03 CDR Okay, 4 minutes and 20 - -

CONFIDENTIAL

00 02 33 05 CT ... this is ...

00 02 33 06 CDR - - ... to burn.

00 02 33 14 CMP We're running about 3 miles low.

00 02 33 17 LMP Okay.

00 02 33 19 CDR What about H-dot?

00 02 33 20 CMP But she's pretty steady.

00 02 33 24 CDR Okay. It's back to about zero on the ball.

00 02 33 28 CMP And we have 05.

00 02 33 29 CDR Okay.

00 02 33 34 CMP Okay. Five minutes. H-dot's a tad low, altitude's a little low, and the velocity's just about in the money. Okay. We're looking for 35 - -

00 02 33 44 CC Apollo 14, Houston through ARIA 2. Over.

00 02 33 49 LMP Go ahead, Houston.

00 02 33 50 CDR That - Burn's going well.

00 02 33 53 LMP Okay, Al. I have about -

00 02 33 55 CMP Okay, let us talk about what we're going to do.

00 02 33 58 LMP Okay.

00 02 33 59 CDR 35559.

00 02 34 00 CMP We're going to see that on the DSKY. And then we're going to shut down.

00 02 34 08 LMP We've got 30 - 25 seconds to cut-off.

00 02 34 14 CDR We're getting a yaw in here, too.

00 02 34 15 CMP There's 35 - 100, 200, 275, 350, 450. Should be shutting down.

00 02 34 26 CDR There's the CUT-OFF.

~~CONFIDENTIAL~~

00 02 34 28 CMP Okay.

00 02 34 29 CC Roger, 14. Cut-off.

00 02 34 33 CMP And tanks are venting down. The oxidizer is coming down through 35 now. The fuel is coming down through 30.

00 02 34 41 LMP Okay, Al. SCS TVC - -

00 02 34 43 CC 14. Roger on the vent.

00 02 34 47 LMP - - SERVO POWER, number 1, OFF.

00 02 34 48 CDR It's OFF.

00 02 34 54 LMP RATE, LOW.

00 02 34 55 CMP RATE, LOW. Okay.

00 02 34 56 LMP No, no, no. BIT RATE, LOW.

00 02 34 58 CMP Oh, BIT RATE, LOW.

00 02 34 59 LMP Okay.

00 02 35 00 CMP That's you.

00 02 35 01 LMP Yes, yes, I got it. EMS MODE, STANDBY.

00 02 35 03 CDR Houston, 14.

00 02 35 04 LMP EMS FUNCTION, OFF.

00 02 35 05 CC 14, Houston. Go ahead.

00 02 35 09 CDR Okay, reading a V_I , plus 35542; DELTA- V_C , minus 8.8; H-dot, plus 04399; H-pad, plus 01747.

00 02 35 18 CMP Okay, DELTA-Vs, OFF.

00 02 35 20 LMP Okay. Let's start again. EMS MODE, STANDBY; EMS FUNCTION, OFF.

00 02 35 30 CMP EMS MODE, STANDBY; EMS FUNCTION, OFF.

00 02 35 33 LMP SECS - -

~~CONFIDENTIAL~~

00 02 35 34 CC 14, this is Houston. We copy V_I , plus 35542; DELTA- V_C of minus 8, and ... the last two. Would you repeat?

00 02 35 55 CDR Okay. H-dot, plus 04399; altitude, plus 01747.

00 02 36 06 CMP PYRO ARM switches are off.

00 02 36 07 CC Roger. Plus 04399 and plus 01747.

00 02 36 14 CDR Okay, I'm not sure I got your H-dot readback. It's plus 04399.

00 02 36 22 CC Roger; 04399.

00 02 36 25 LMP Okay, FDAI number 1, INERTIAL; RHC number 2, locked.

00 02 36 29 CMP Okay, FDAI number 1 is now INERTIAL; RHC number 2 is now locked.

00 02 36 35 LMP And Stu is going to PRO and to POO.

00 02 36 37 CMP Okay. Let me get the ACTIVITY light out.

00 02 36 39 CDR How close did that baby cut out?

00 02 36 42 LMP On time.

00 02 36 43 CDR No, on velocity, Stu?

00 02 36 45 CMP Well, it was - 20 - -

00 02 36 48 LMP Within 7 feet per second, it looks like.

00 02 36 52 CMP Nineteen -

00 02 36 54 LMP CMC and ... feet per second.

00 02 36 56 CMP Yes, yes.

00 02 37 01 LMP Okay, and let's see. Your H-dot's 4399 - You said that's good.

00 02 37 03 CMP H - the H was low. See, we were low all the way. That may have been the design or something.

00 02 37 09 CDR Okay, Ed.

CONFIDENTIAL

Day 1

00 02 37 11 LMP Okay, CMC ACTIVITY light out, key VERB - key VERB 66 ENTER, Stu.

00 02 37 16 CDR I'll have to get that. We got ...

00 02 37 19 LMP At your - Switch couches.

00 02 37 21 CMP Get out of my couch.

00 02 37 22 LMP Did you get your FDAI 1 - number 1 to INERTIAL off?

00 02 37 26 CDR Yes, I did.

00 02 37 27 LMP Okay.

00 02 37 28 CDR Houston, on the S-IVB - -

00 02 37 29 LMP And, Stu, did you get - put the WASTE STOWAGE VENT valve to CLOSE?

00 02 37 30 CDR - - oxidizer pressure, it's now down around 18, and the fuel pressure is about 17.

00 02 37 42 LMP We still have comm with him?

00 02 37 43 CMP Marginal.

00 02 37 44 CDR Oh, it's still kind of - -

00 02 37 45 CC ... 17 on the tank pressures.

00 02 37 48 CDR Okay, I guess he's reading us.

00 02 37 49 LMP What are you going to do about your connections?

00 02 37 51 CDR On.

00 02 37 52 LMP Let's - It looks like - -

00 02 37 53 CDR Oh, look at us climb away.

00 02 37 56 LMP ... suits.

00 02 37 58 CMP Doff the suits.

00 02 37 59 LMP Okay. Okay, SUIT POWER - -

CONFIDENTIAL

00 02 38 10 CMP Let's see. Let me get this WASTE STOWAGE VENT before - -

00 02 38 13 LMP Yes, WASTE STOWAGE VENT valve, CLOSED.

00 02 38 27 CMP Okay, it's CLOSED.

00 02 38 41 CMP Let me see, I'm turning off - -

00 02 38 56 SC ...

00 02 38 58 CDR They're not mine.

00 02 39 00 LMP Go ahead, Houston. Say again.

00 02 39 02 CC You're loud and clear, Ed. And we should have continuous voice and data from here on out. You're loud and clear through Guam.

00 02 39 12 LMP Okay, Gord - -

00 03 00 48 CMP ... VERB 62 - -

00 03 00 49 LMP And you can get GO for pyro arm.

00 03 00 50 CMP Houston, 14. Like a GO for pyro arm.

00 03 00 57 CC 14, Houston. You're GO for pyro arm.

00 03 00 59 CMP Okay. A's armed. B's armed.

00 03 01 02 LMP Okay, GDC ALINE.

00 03 01 09 CMP 0, 180, C.

00 03 01 14 LMP EMS FUNCTION, DELTA-V.

00 03 01 15 CMP Okay.

00 03 01 16 LMP Verified.

00 03 01 17 CMP DELTA-V and NORMAL.

00 03 01 18 LMP Okay, you can start your DET.

00 03 01 20 CDR VERB 62 now.

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Day 1

00 03 01 23 CMP Okay. What we're going to do here is start the
DET. 59:50, I'll go to AUTO; 59:58, I'll hit it
with some thrust. I'll punch this and check and
make sure these go to zero. You - you did do a
VERB 62? Is that - -

00 03 01 39 CDR ...

00 03 01 40 CMP Okay.

00 03 01 41 CDR ... VERB 62.

00 03 01 42 CMP So we'll come off and, if this needle is negative,
I'll go to PITCH to ACCEL COMMAND, start it up,
and, when she goes across, you'll give me two
PROs -

00 03 01 50 CDR Two PROs.

00 03 01 51 CMP - and I'll go to RATE COMMAND, and we'll come on
around. Okay?

00 03 01 55 CDR Okay. I'm ready.

00 03 01 56 LMP Okay.

00 03 01 57 CMP Let's set a record, shall we?

00 03 01 58 CDR Okay.

00 03 01 59 CMP All right.

00 03 02 00 LMP Slow and easy.

00 03 02 02 CMP Okay. And we're going to start.

00 03 02 03 CDR Okay, ...

00 03 02 04 CMP Sweaty-palm time.

00 03 02 05 LMP Okay. At 59:50, CMC MODE, AUTO.

00 03 02 13 CMP Sweaty-palm time.

00 03 02 14 LMP Oh, no. Just do it slow and easy.

00 03 02 17 CMP Oh, no. I just keep mumbling that.

CONFIDENTIAL

00 03 02 19 LMP/CMP Okay.

00 03 02 20 CMP We're AUTO. At 8:58, plus-X thrust and zero - 56, 57, 58.

00 03 02 30 LMP There she blew.

00 03 02 32 CDR Okay.

00 03 02 33 CMP Okay. Okay. She's negative.

00 03 02 36 LMP Is your launch vehicle tank pressure full scale low?

00 03 02 39 CMP That's affirmative.

00 03 02 40 LMP Okay.

00 03 02 41 CMP Okay, I'm going to start her up.

00 03 02 43 LMP Your propellants are all - -

00 03 02 44 CDR You got two, and I - -

00 03 02 45 CMP Okay. Give me a couple PROs.

00 03 02 46 CDR You ready?

00 03 02 47 CMP Ready.

00 03 02 48 CDR Okay. PRO.

00 03 02 49 CDR PRO again.

00 03 02 54 CMP Look out that window!

00 03 02 56 LMP Yes, look at all that crap.

00 03 02 59 CDR Okay, Houston. We have separated. Turnaround has started.

00 03 03 03 CC Roger.

00 03 03 07 CDR And we have the usual couple of Parker valves.

00 03 03 13 LMP Okay. SERVICE MODULE RCS SECOND PROPELLANT FUEL PRESS, low - or CLOSE, and the REACTANTS valve, NORMAL.

CONFIDENTIAL

Day 1

00 03 03 24 CMP ...

00 03 03 25 LMP You want to verify - -

00 03 03 26 CDR Fuel propellant ...

00 03 03 30 LMP Okay.

00 03 03 31 CDR Okay.

00 03 03 34 CMP Okay. Can you see anything out there good?

00 03 03 36 CDR Okay, you don't want to change the DAP early on this - -

00 03 03 38 CMP No. No, not until after I've given 4 seconds of ullage forward.

00 03 03 42 LMP Okay, I just wanted to verify - -

00 03 03 43 CMP You should be looking for the S-IVB - there goes a panel out there. You can see it drifting out.

00 03 03 49 LMP Yes, there it is.

00 03 03 51 CDR There it is, yes. Oh, man. That's beautiful.

00 03 03 55 CMP What's our range?

00 03 03 56 LMP What?

00 03 03 57 CMP Are we within - Oh, yes.

00 03 03 59 LMP Oh, yes.

00 03 04 00 CDR I'd say it's - Oh, yes, we're real fine, Stu.

00 03 04 03 LMP Come right on down to - Steady as a rock.

00 03 04 06 LMP Houston, 14.

00 03 04 08 CC Go ahead.

00 03 04 12 LMP You should have the television here in a minute. There it comes.

00 03 04 18 CMP Okay, come right on with that - -

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00 03 04 19 CC ... We're not seeing it yet.

00 03 04 23 CMP Oh, shit. It's not quite lined up, damn it. Okay. 1, 2, 3, 4. Okay?

00 03 04 33 CDR Okay. You doing a - -

00 03 06 54 CMP - - a little more at it here ... I gave it a solid ...

00 03 06 59 CDR Looks to me like you're still closing, Stu.

00 03 07 04 CMP I'm closing slowly. Now, wait until I get in, and see how it - We've got lots of time.

00 03 07 11 CDR Going to break the record, man. Take it slowly.

00 03 07 13 CMP We've already used a little more than I do in the simulator for some reason.

00 03 14 59 CMP Okay, Houston. We've hit it twice and - sure looks like we're closing fast enough. I'm going to back back out here and try it again.

00 03 15 24 CMP Well, there goes the record.

00 03 15 27 LMP Don't worry about it. Let's get him picked up.

00 03 15 31 CMP Okay.

00 03 23 31 CDR I'm glad we've been through it. And here we come in again.

00 03 23 44 CMP 1, 2, 3, 4 - Son of a bitch - nothing! Okay, Houston, I hit it pretty good and held 4 seconds on contact, and we did not latch.

00 03 24 03 CC Roger. We're seeing it all on TV here.

00 03 24 09 CMP (Sigh) Shit.

00 03 24 25 CMP ... one more time.

~~CONFIDENTIAL~~

TIME SKIP

00 04 31 18 CMP I'm going to tap it one more time.

00 04 31 43 CMP Okay. That's at least - ... tap it. Well, I'm going to tap it there. ... allow a little for the ... real world ...

00 04 31 56 CMP The alinement is good.

00 04 31 58 CDR Okay. Okay.

00 04 31 59 LMP I'm happy with alinement here.

00 04 32 00 CDR All right. Verified we're in RETRACT. I'm going ...

00 04 32 05 CMP And done.

00 04 32 12 LMP About 4 feet out, Houston.

00 04 32 15 CC Roger, Ed.

00 04 32 21 CMP My alinement is good. Stand by.

00 04 32 25 LMP Here it comes.

00 04 32 33 CMP No.

00 04 32 34 CDR No. No latch.

00 04 32 37 CMP No got - no latch, Houston.

00 04 32 40 CC Roger.

00 04 55 40 LMP About 6 feet out.

00 04 56 21 LMP About - 2 feet.

00 04 56 35 CMP About a foot. Here we go.

00 04 56 48 CMP Okay, RETRACT.

00 04 56 50 CDR Nothing happened.

00 04 56 52 CMP Nothing?

~~CONFIDENTIAL~~

00 04 56 53 CDR I don't know. I got - got a barber pole. We got a hard dock.

00 04 57 00 LMP We got some, Houston.

00 04 57 02 CMP I believe we got a hard dock, Houston.

00 04 57 06 CDR Okay, Houston, the - -

TIME SKIP

00 05 45 36 LMP Okay, circuit breaker SECS ARM, two, closed - -

00 05 45 39 CMP ...

00 05 45 40 LMP I'm sorry - DET, RESET.

00 05 45 42 CDR Okay. Wait - wait a minute, baby. ...

00 05 45 44 CMP Yes, we sure do. ... Let's forget that.

00 05 45 51 LMP Okay, DET - -

00 05 45 52 CMP No, let's get your last circuit breakers now.

00 05 45 53 LMP Well, this is the first circuit breaker.

00 05 45 55 CMP Okay.

00 05 45 56 LMP DET, RESET.

00 05 45 57 CMP I've done that.

00 05 45 59 LMP Circuit breaker SECS ARM, two, closed; verify.

00 05 46 01 CMP ARM, two, closed; verified.

00 05 46 02 LMP SECS LOGIC, two, on (up).

00 05 46 04 CMP On (up).

00 05 46 05 LMP You need a GO for pyro arm.

00 05 46 07 CDR Houston, 14. We'd like a GO for pyro arm, please.

00 05 46 14 CC You have a GO for pyro arm.

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Day 1

00 05 46 16 CMP Okay. I guess that was a GO.

00 05 46 19 LMP SECS PYRO ARM, two, on - -

00 05 46 21 CMP Could have been a NO GO. ... Okay, the pyros are armed.

00 05 46 25 LMP TVC SERVO POWER number 1, AC 1/MAIN A.

00 05 46 28 CMP AC 1/MAIN A.

00 05 46 30 LMP Arm your RHC - -

00 05 47 07 CMP Give me a mark when you get set.

00 05 47 10 CDR Okay, ready for SEP.

00 05 47 11 LMP Houston, we're GO for SEP.

00 05 47 12 CDR 3, 2, 1, 0, 1, 2, 3, 4, 5. Okay, Ed?

00 05 47 22 CMP 6, 7, 8. Okay.

00 05 47 24 LMP Okay.

00 05 47 26 CDR Let's take a look at the 83. Copy down minus 0.7, 0, 0.

00 05 47 29 LMP Minus - -

00 05 47 31 CDR 0.7, 0, and 0.

00 05 47 33 CMP CRYO PRESS.

00 05 47 34 LMP Minus 0.7, 0, at 0.

00 05 47 37 CDR Okay.

00 05 47 38 CMP Check the CRYO PRESS.

00 05 47 39 LMP Okay, CRYO PRESS.

00 05 47 43 CMP These O₂ tanks there are closed?

00 05 47 45 LMP No, I think that's surge tanks - -

00 05 47 46 CMP No, that's the surge tanks.

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00 05 47 48 LMP Okay, there it is. Tank 3. Want the heaters off?

00 05 47 54 LMP Houston, my CRYO PRESS light in the - -

00 05 47 59 CMP Look outside, Al, if you want to see something beautiful.

00 05 48 00 LMP - - ... O₂ tank 3.

00 05 48 02 CC ... We're - -

00 05 48 03 CDR ...

00 05 48 07 CC - - I just called to say ...

00 05 48 08 LMP Roger. Sorry, that's also tank 1 and 2 - -

00 05 48 10 CMP Look at those big pieces floating around there.

00 05 48 11 LMP - - that just dropped down.

00 05 48 16 CDR Really sparkles.

00 05 48 17 CMP Okay, let's keep us honest, Ed.

00 05 48 18 LMP Okay, go to P00.

00 05 48 19 CDR We're at P00.

00 05 48 20 CMP We've gone to P00.

00 05 48 21 LMP Com - COMPUTER ACTIVITY light out. Do a VERB 66.

00 05 48 25 CDR VERB 66 ENTER.

00 05 48 27 LMP SECS PYRO ARM, two, SAFE.

00 05 48 29 CMP Okay. That's SAFE. Let's get our maneuver going.

00 05 48 31 LMP Okay. Let's get on through the checklist. SECS LOGIC, two, OFF.

00 05 48 35 CMP Yes. I'm just going to ...

00 05 48 37 LMP Circuit breakers SECS ARM, two, open.

00 05 48 40 CMP Okay. I've got the ARMs, off; the LOGICs, OFF; and ARM circuit breakers, open.

00 05 48 47 LMP Okay. I'm pulling the S-IVB/LM SEP open.

00 05 48 48 CDR Ready.

00 05 48 49 CMP Okay. CMC, AUTO; RATE 2, and RATE COMMAND - -

00 05 48 53 LMP Okay. And I'm going to verify the ... O_2 -

00 05 48 57 CMP How about our RCS ... - -

00 05 48 58 CDR Okay. Let's - -

00 05 49 00 CMP - - No - -

00 05 49 01 CDR - - ... check these things off.

00 05 49 04 LMP Okay.

00 05 49 05 CDR Okay. We're all gray.

00 05 49 06 LMP LAUNCH VEHICLE/SPS INDICATOR switch at GPI.

00 05 49 09 CMP Okay.

00 05 49 10 LMP TVC SERVO POWER, two, OFF.

00 05 49 12 CMP Okay.

00 05 49 13 LMP EMS MODE, STANDBY.

00 05 49 15 CMP Okay.

00 05 49 16 LMP EMS FUNCTION, OFF.

00 05 49 17 CMP Okay.

00 05 49 19 LMP TAPE RECORDER, OFF.

TIME SKIP

00 06 28 58 CDR I'm not having any trouble at all with weightlessness.

00 06 29 01 LMP I'm not either, Al.

00 06 29 06 CDR How are you doing, Stu?

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Day 1

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00 06 29 07 CMP Well, so far, so good.

00 06 29 09 CDR Really very comfortable.

00 06 29 11 CMP Yes, I - I guess I'm a little surprised at - at the fighting to stay down -

00 06 29 17 CDR Yes.

00 06 29 18 CMP - if any.

00 06 29 19 LMP Well, I think a lot of this is due to these hoses we got on here. Once we get rid of them, it'll be a little different.

00 06 29 25 CMP There are a jillion stars out there.

00 06 29 28 LMP I think you've got a whole bunch of little things to look at.

00 06 29 34 CDR Venting of the S-IVB.

00 06 29 35 LMP In fact, you've got a - Let me help you with that ...

00 06 29 46 CMP Okay. I think we'll start - I'm going to start clearing my pockets out, in preparation to get this suit off.

00 06 29 54 LMP Good show.

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DAY 2

01 06 09 45 CMP That's kind of wild, isn't it? NOUN 20 ENTER.
281.2, 353, and 297.5. Okay. There's an ENTER.
Computer's yours, Leader.

01 06 10 09 CDR ... Okay, it's star 25.

01 06 10 12 CMP Okay ... - -

TIME SKIP

01 06 34 37 CMP ... and we have AC/DC, DIRECT. We have CMC, AUTO.
We are ATT 1/RATE 2. We have A, ON. We are RATE
COMMAND. We are AUTO. We're sitting at ATTITUDE.
We're sitting at trim.

01 06 35 06 LMP Okay, Gordon, looks like we've got the high gain.

01 06 35 34 CMP At 35, DSKY blanks.

01 06 35 35 LMP Okay, DSKY's on time.

01 06 35 40 LMP EMS, normal.

01 06 35 41 CMP EMS is normal. Check the PIPAs.

01 06 35 43 LMP ...

01 06 35 49 CMP Twenty seconds.

01 06 35 50 LMP PIPAs are good. No ullage.

01 06 35 53 CMP No ullage.

01 06 35 58 LMP Counting. How much?

01 06 36 00 CMP Ten.

01 06 36 01 LMP Okay.

01 06 36 02 CMP Count it down, Al.

01 06 36 04 CDR 5, PRO, 3, 2, 1 -

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01 06 36 08 CDR ZERO.

01 06 36 09 LMP A system?

01 06 36 10 CMP B.

01 06 36 11 LMP B.

01 06 36 12 CMP P_C ... - -

01 06 36 13 LMP 5, 4, 3, 2, 1 -

01 06 36 18 LMP ZERO. There it is.

01 06 36 20 CMP ENTER. G&N SHUTDOWN.

01 06 36 21 LMP All right, good.

01 06 36 23 CMP All righty, we've had shutdown. DELTA-V THRUST, two, OFF; verify our gimbal motors coming off.

01 06 36 29 CMP I wonder if those were stowed right (laughter). Okay, you ready, number 2?

01 06 36 33 LMP Yes.

01 06 36 34 CMP YAW 2, OFF?

01 06 36 35 LMP You've got it.

01 06 36 37 CMP PITCH 2, OFF.

01 06 36 38 LMP Okay.

01 06 36 39 CMP YAW 1, OFF?

01 06 36 40 LMP You've got it.

01 06 36 41 CMP PITCH 1, OFF.

01 06 36 42 LMP You've got it.

01 06 36 43 CMP Okay.

01 06 36 44 LMP BUS TIEs coming off.

01 06 36 45 CDR Okay, you want to bring OFF your TVC SERVO POWERS.

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01 06 36 48 CMP TVC SERVO POWERS, OFF.

01 06 36 50 CDR Okay, and - ...

01 06 36 54 CMP Okay.

01 06 36 56 CDR MAIN BUS TIEs are OFF.

01 06 36 57 CMP MAIN BUS TIE, OFF. Let's go to 60 85, and what are our trim rules?

01 06 37 02 LMP Okay.

01 06 37 03 CDR ...

01 06 37 06 CMP Okay, Houston. That was a mighty good burn, there. The residuals - There'll be no trim required.

01 06 37 14 CDR ... DELTA-V_C -

01 06 37 22 CMP Okay, you got minus 4.1, ... off.

01 06 37 31 CDR Okay. ...

01 06 37 42 CMP DIRECT, two, OFF.

01 06 37 43 CDR Okay, open the ULLAGE, two, circuit breakers.

01 06 37 46 CMP They're open.

01 06 37 47 CDR And ...

01 06 37 49 CMP Okay, PITCH 1 and YAW 1.

01 06 37 50 CDR RATE 2 and PCM BIT RATE, LOW.

01 06 37 56 CMP How about a boot in the ass, huh?

01 06 37 57 LMP That was pretty nice.

01 06 37 59 CMP Man, TEI is going to be a kick in the butt.

01 06 38 00 CDR Probably ...

01 06 38 01 LMP Okay, ... - -

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DAY 4

03 04 26 50 CDR ... the old filter on the air is on the right. Is it not? ...

03 04 28 12 CDR Hope this ... helps us.

03 04 28 22 CMP Houston, 14.

03 04 28 27 CC Go ahead, 14.

03 04 28 30 CMP Okay, Bruce. Smoking over the flight plan, we moved up that maneuver to the Moon-view attitude, and I'm going to go wide dead band here right after midcourse 4 instead of where it shows over at 78:50, if y'all agree.

03 04 28 52 CC Roger. We concur.

03 04 28 55 CMP Okay.

03 04 30 33 CDR ... might. I been looking for residuals. See how well it burns when we ...

03 04 30 47 LMP Amazing. ... residuals ... the whole thing on RCS.

03 04 30 51 CMP Oh, that'd kill it. Man, that'd be - What's the DELTA-V total that time? 3.8? Yes. Forty pounds of gas.

03 04 31 22 CMP Yes, looks like that ought to be pretty clear ...

03 04 31 27 CDR ... out there.

03 04 31 40 CMP You know, just like this morning. Now, we're - we're not in any panic, but we're having to hustle to - be right. Tomorrow morning, it's going to be much worse.

03 04 31 54 CDR We want to be sure we get up a little early. ... like you say.

03 04 31 59 CMP Besides, we want to really ... over and have things organized.

03 04 32 30 CDR Ed.

CONFIDENTIAL

03 04 32 32 LMP Yes.

03 04 32 33 CDR Does everything look good up in the tunnel for the burn?

03 04 32 36 LMP Say again.

03 04 32 37 CDR Does everything look good up in the tunnel for the burn?

03 04 32 39 LMP Yes. Just a second. I think it does. Let me get this tape. How far are we away from the burn?

03 04 32 46 CDR Oh, about 20 minutes, I guess.

03 04 32 49 LMP Okay.

03 04 32 50 CMP Twenty-six minutes.

03 04 32 57 LMP Stuff that in there.

03 04 33 02 CDR Okay.

03 04 33 03 LMP All right, let me swing up here and take a quick look.

03 04 33 16 CDR DELTA-V_C, 00002.

03 04 33 21 CMP Yes. I was just smoking that over. I wonder - Now let me see here. We got a - a 98.4, so it went - 1.6.

03 04 33 36 LMP Everything's good. You'll - switch. Wait a minute. No. You have to come - up around this way.

03 04 33 54 CMP We've got a 0.16 per second. No - 100 seconds. We got a 1.6, so we got a 0.016. Okay.

03 04 34 20 LMP Okay?

03 04 34 21 CDR Yes.

03 04 34 22 LMP Went right by you.

03 04 34 24 CMP ...

03 04 34 28 LMP Oh, went pretty smooth.

CONFIDENTIAL

03 04 34 53 CDR Okay. Do we have those optics zeroed, you suppose?

03 04 34 58 CMP We - we should have them, yes. I - sure meant to do that. Thank you. Power is still on, I think.

03 04 35 28 CDR Let's stop that - ... alarm.

03 04 35 36 LMP Give me that ... before it goes floating around all over the place.

03 04 35 40 CDR Yes.

03 04 35 42 CMP It went away.

03 04 35 43 CDR I didn't - I reset it. I just went into ZERO and then OFF - turned the power off. That's where the alarm came from.

03 04 35 54 CMP Oh, no. We - we - we want the switch in ZERO.

03 04 35 58 LMP Do you?

03 04 35 59 CMP Yes. Hope. Yes.

03 04 36 08 CDR ... is just turn it off.

03 04 36 11 CMP Yes. I'm not sure what it does with the - with the optics off; whether or not it really ought to be ZERO with G&N power on.

03 04 36 27 CDR ... would be sure, if you did it that way.

03 04 36 48 CDR Okay. Now they're ... we locked.

03 04 37 02 CMP Yes, because we got a sextant star check, as a matter of fact, so we do want the power on.

03 04 37 07 CDR Yes.

03 04 37 13 CDR Okay. How do we stand on your burn card?

03 04 37 18 CMP Okay. We just cycled the cryo fan. No, I don't think we have to ... do that. EMS DELTA-V check, we have done. Now, let me think here. Now, we - In 30 seconds, that's going to go through zero, the way I figure that. We got a bias at 0.016 per second. We're going to have it on 30 seconds. Looks like it's going to go to 0.48.

CONFIDENTIAL

03 04 37 59 CDR Oh; 89 04? Is that what you want?

03 04 38 04 CMP 98 - -

03 04 38 05 CDR ... 98 04, 1.6, 0.16, 0.016 per second. Right?
0.016 per second.

03 04 38 29 CDR Want me to check it?

03 04 38 34 CMP Yes.

03 04 38 40 CDR You're right.

03 04 38 41 CMP How about a sextant star check there, leader.

03 04 38 45 CDR Okay.

03 04 38 46 CMP We're in attitude.

03 04 38 49 LMP Did you get your optics set up?

03 04 38 52 CDR I just caught up.

03 04 38 56 LMP Okay.

03 04 39 10 CDR You want to give me the angle?

03 04 39 11 LMP Roger. 17320.

03 04 39 28 CMP Houston, 14.

03 04 39 35 CC Go ahead, 14.

03 04 39 36 CMP Okay. The pad value for DELTA- V_c is 0.2, and y'all
gave us that before we ran our null bias check.
Is that - is that still a good value?

03 04 39 56 CC That's - still a good number, Stu.

03 04 39 58 CMP Okay.

03 04 40 48 CDR There's a lot of reflected light on, I'll tell you.

03 04 40 52 LMP Say again?

03 04 40 53 CDR There's a lot of reflected light on this - sextant.

CONFIDENTIAL

03 04 41 03 CDR ... star? We still moving?

03 04 41 07 CMP VERB 16 NOUN 20 ENTER. We're probably in the dead band, but we're in attitude.

03 04 41 14 CDR Okay. This baby looks all out of focus. ... a light.

03 04 41 56 CDR Okay.

03 04 42 26 CMP No star, leader?

03 04 42 37 CDR Well - our - Something doesn't look right to me, somehow. The way it's bringing this 353, which is about a minus -

03 04 43 11 CMP Why don't you zero the optics?

03 04 43 15 CDR Okay.

03 04 43 18 CMP Wait 15 seconds, then - try again.

03 04 43 32 CDR See where we are ...

03 04 43 40 CMP Okay. Now try your VERB 41.

03 04 43 43 CDR Okay. And ZERO, OFF. ...

03 04 43 57 CC 14, Houston.

03 04 43 59 CMP Go ahead.

03 04 44 00 CDR Go ahead, Houston.

03 04 44 03 CC Okay, we'd like to get the high gain, whenever you can crank it up.

03 04 44 09 CDR That looks better.

03 04 44 26 LMP Let me have the pad, Al.

03 04 44 33 CMP You want a 91, Al? So I'll - You can tell me when you're there?

03 04 44 36 CDR Yes.

03 04 44 37 CMP Okay. Tell me when you got it.

CONFIDENTIAL

03 04 44 42 CDR ... much.

03 04 44 44 CMP Okay. 33072. Let's - add something ...

03 04 44 49 LMP Yes, that figures. 335.

03 04 44 52 CMP And we're 330, so we're 0.5. We pass?

03 04 44 57 CDR Pass.

03 04 44 58 LMP Pass.

03 04 44 59 CMP Pass.

03 04 45 15 CMP Hey, ... why don't you leave it on there. Last night, we noticed it took a little while for the narrow to take effect.

03 04 45 21 LMP All right.

03 04 45 32 CMP Okay. Circuit breakers. Let me check them again.

03 04 45 39 LMP Houston; 14 on the high gain. How do you read?

03 04 45 46 CC Loud and clear, Ed.

03 04 45 49 LMP Okay.

03 04 45 50 CC ...

03 04 45 54 CMP MANUAL ATTITUDE, three are RATE COMMAND; ATTITUDE DEAD BAND, MIN; RATE is LOW; THC, POWER, we don't need; SCS TVC, two, is RATE COMMAND; DELTA-V_{CG} is LM/CSM; TVC GIMBAL DRIVE, PITCH and YAW, is AUTO. Okay. I think we're down to 54 minutes. Let's try it again.

03 04 46 18 CDR Okay.

03 04 46 20 CMP ... OPTICS are ZERO. ... that's cycle CRYO FANS; EMS DELTA-V, check; set DELTA V_C at 0.2; EMS FUNCTION in DELTA V; BMAG, three, to RATE 2; AUTO RCS SELECT, I have 4, 5, 6, 7, 8, 9, 10, 11, 12. DAP is loaded; RC POWER NORMAL, two, DC. No television. Okay. Shall we go into P40 while we're given time to smoke that over. Okay. All right. VERB 16 NOUN ... ENTER. ...

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03 04 47 14 CMP Hack. Okay.

03 04 47 16 LMP Something's wrong.

03 04 47 18 CDR Oh, ... right.

03 04 47 20 CMP Okay, does 3.8 agree with the DELTA-V total?

03 04 47 25 LMP 3.8.

03 04 47 26 CMP Okay. All right. The event timer is set; SPACE-CRAFT CONTROL is CMC and AUTO; we've maneuvered to the pad burn attitude; sextant star check, pass; we're P40 to the 50 18; GDC is alined 000. I have rechecked my circuit breakers twice. Let me do it for three times.

03 04 47 54 LMP ... switches, too, huh?

03 04 47 56 CDR They looked all right this morning.

03 04 47 58 CMP I have pushed each one of these ...

03 04 48 14 CDR ... seconds?

03 04 48 18 LMP Yes. That's what they said.

03 04 48 27 CDR So, all we do is pitch to 0, plus 1, and - -

03 04 48 32 LMP Hey, how come the air is shut off here? I'm not getting any air flow.

03 04 48 38 CDR ... when Stu was sleeping - -

03 04 48 39 CMP Oh, I shut that off last night. Boy, you - sent me to sleep with all three in SUIT FULL FLOW. I think because you were taking a crap. Man, that thing blowing down on my - froze my butt off, so I slipped up in the dark of the night and turned the flow off.

03 04 49 09 CMP Okay. MANUAL ATTITUDE, three, is RATE COMMAND; DEAD BAND is MIN; RATE is LOW; TC, POWER, we don't need; RATE COMMAND; DELTA V_C , IM/CSM; TVC GIMBAL DRIVE, PITCH and YAW, to AUTO. Okay. We're at 54 minutes.

~~CONFIDENTIAL~~

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Day 4

03 04 49 37 CDR All you have to do is blink your eye to turn it off.

03 04 49 41 CMP That's about it.

03 04 49 43 LMP And then you'll be too long.

03 04 49 46 CMP And DELTA-V - THRUST A. All ... - -

03 04 49 50 CDR I'll count down to zero and, say, plus 1; then you shut it off, then; okay?

03 04 49 57 CMP Don't have to worry about this.

03 04 49 59 CDR Not going to have any ... down - -

03 04 50 02 LMP It's their ...

03 04 50 03 CC ...

03 04 50 04 LMP Go ahead, Houston.

03 04 50 08 CDR 1.0.

03 04 50 09 CMP For 1?

03 04 50 10 CC Okay. Your high gain is oscillating a bit there. Why don't you try another acquisition there, Ed.

03 04 50 17 LMP Roger, Fred. We've tried it twice and it's still doing it. I'll give it one more go.

03 04 50 21 CMP What?

03 04 50 22 CDR ... RCS.

03 04 50 23 CMP 1.0. Hey, that's beautiful.

03 04 50 35 CDR ... No ullage.

03 04 50 38 LMP No ullage. All right.

03 04 50 40 CMP There any other remarks on the pad I don't know about?

03 04 50 43 LMP That's all. No ullage? That's all of them.

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03 04 50 56 CDR Got the VERB 30 from Rigel.

03 04 51 00 CMP You know, I can't relax in this couch? Just flat-ass can't do it, damn it. I'm always tense.

03 04 51 07 CDR Plus 32, yaw, 290.

03 04 51 13 LMP That's where I am.

03 04 51 39 LMP Houston, 14. That seems to be the best we can do. It's still oscillating.

03 04 51 41 CDR I still don't know if I can - -

03 04 51 42 LMP Got a suggestion?

03 04 51 44 CMP I called and asked him.

03 04 51 45 CDR Yes. I know. I heard you.

03 04 51 46 CMP I don't believe him. I want to see when that is. ... zero. I'll be looking down here at zero. ... zero. The way I figure it, that should have already gone through zero. Yes. Okay, Ed. Let's have MAIN BUS TIES.

03 04 52 17 CDR ...

03 04 52 19 LMP Got A - and B.

03 04 52 22 CMP Okay.

03 04 52 23 CDR Okay, MAIN BUS TIE is on.

03 04 52 25 CMP I'm lost here, Al. PCM power; we don't do that.

03 04 52 27 CDR Okay, TVC SERVO POWER 1, AC 1?

03 04 52 30 CMP Okay.

03 04 52 32 CDR 2 AC 2.

03 04 52 33 CMP Okay.

03 04 52 34 CDR REC 2 AC. ... DIRECT, two, OFF.

03 04 52 37 CMP Okay.

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03 04 52 38 CDR BMAGs, three, one-half.

03 04 52 43 CMP Okay.

03 04 52 44 CDR SPACECRAFT, SCS. Arm the RHC. Okay. Start number 1 ...

03 04 52 55 CMP Okay. You ready, Ed?

03 04 52 57 LMP All right. Bring it on.

03 04 52 59 CMP Okay. PITCH 1?

03 04 53 00 LMP You have it.

03 04 53 01 CMP YAW 1.

03 04 53 02 LMP You have it.

03 04 53 03 CDR Okay. Verify plus 0.9 - -

03 04 53 06 CC Okay, Ed. Suggestion - -

03 04 53 07 CDR - - minus 0.33.

03 04 53 08 CC - - is to take the SERVO ELECTRONICS switch, panel 2; go to SECONDARY and then PRIMARY.

03 04 53 14 CDR Verify MTVC.

03 04 53 15 LMP Okay.

03 04 53 16 CMP Okay. I have it.

03 04 53 17 CDR Okay.

03 04 53 19 CMP Okay. MC.

03 04 53 22 CMP No - -

03 04 53 23 CDR No - Go to bias.

03 04 53 24 CMP Yes. Now twist the handle.

03 04 53 26 CDR Right.

03 04 53 27 CMP Okay. You ready for number 2's, Ed?

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03 04 53 30 LMP Bring them on.

03 04 53 31 CMP FITCH 2.

03 04 53 32 LMP You have it.

03 04 53 34 CMP YAW 2.

03 04 53 35 LMP You have that one.

03 04 53 37 CMP Damn!

03 04 53 38 CDR Set the trim - plus 0.9.

03 04 53 40 CMP It's set.

03 04 53 43 CDR 0.33.

03 04 53 45 CMP Minus 0.33.

03 04 53 46 CDR Minus 0.33.

03 04 53 48 CMP Okay, and a half. Okay, we're setting there. CMC.

03 04 53 54 CDR Okay. THC ... verified ... - -

03 04 53 57 CMP Twist the handle.

03 04 53 58 LMP - - MTVC.

03 04 53 59 CMP Zero. No MTVC.

03 04 54 01 CDR Verify GPI returns to zero. Okay.

03 04 54 03 CMP Okay. Then?

03 04 54 04 CDR RHC POWER, NORMAL, two, AC/DC?

03 04 54 06 CMP Okay.

03 04 54 07 CDR DIRECT, two, MAIN A/MAIN B.

03 04 54 09 CMP Okay.

03 04 54 11 CDR And RATE 2 on three, and we'll final trim.

03 04 54 14 CMP Okay.

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03 04 54 22 CDR Okay. That's in there.

03 04 54 25 CMP ATT - Okay.

03 04 54 29 CDR Okay, BMAGs, one-half.

03 04 54 31 CMP Okay, let's - let's just let it settle down on its - oscillation there. Okay, BMAGs are one-half.

03 04 54 39 CDR Okay. The gimbal test option.

03 04 54 41 CMP Okay, let's let her rip. Up 2. Down 2, zero. ...

03 04 54 45 CDR ... Those babies swing, don't they?

03 04 54 51 CMP Two. Zero.

03 04 54 54 CDR One in trim.

03 04 54 58 LMP Okay, - -

03 04 54 59 CMP Okay.

03 04 55 00 LMP - - Houston, we finally got it up on the fourth attempt.

03 04 55 02 CMP Minus 33. We are at trim. Okay.

03 04 55 06 LMP Okay.

03 04 55 07 CMP ... Okay ... attitude. Let me aline the GDC again.

03 04 56 20 LMP HIGH BIT RATE; RECCRD; FORWARD; COMMAND RESET.

03 04 56 30 CDR Okay. No ullage.

03 04 56 31 CMP Okay, a no-ullage burn. We have one thing left to do; that's DELTA-V, NORMAL. We are in one-half. GDC is looking good. We're somewhere here. Okay. We are in RATE COMMAND; MINIMUM; RATE, HIGH; they're AC; AC; DIRECT; CMC, AUTO; 1/RATE 2; DELTA-V THRUST is ON; RATE COMMAND; AUTO; TVC; our SPS circuit breakers are in; RCS LOGIC is out; docking probe; command module heaters; DIRECT ULLAGE. We are ready to burn. Okay.

03 04 57 17 LMP Sounds good.

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03 04 57 23 CMP We are in attitude. We are in trim. SIM SUPs taking it easy on us today.

03 04 57 32 CDR Okay, Houston. We got about 40 seconds to burn; we're ready to go on time. Okay. Coming down to 30. BSKY blank - -

03 04 57 44 CDR Go.

03 04 57 45 CMP - - and EMS MODE, NORMAL. ... quiet.

03 04 57 50 LMP Got to turn it up. ... Turn it up one flip.

03 04 57 54 SC ...

03 04 57 55 LMP Coming up on minus 100. It's going the other way.

03 04 57 58 CMP That's right. If you plus, it'll go - Disregard that. Okay, we're - -

03 04 58 00 CDR Okay. We're 13 seconds until the burn. 10, 8, 7, 6, 5, PRO, 3, 2, 1 -

03 04 58 12 CDR BURN.

03 04 58 15 CMP Okay. DELTA-V THRUST, A, is OFF.

03 04 58 18 CDR That was a shock.

03 04 58 19 CMP Okay, we got a good burn. Minus 2.7.

03 04 58 23 CDR Okay. GIMBAL MOTORS, OFF.

03 04 58 26 CMP ... number 2.

03 04 58 27 LMP Wait a minute. ... All right, tick them off.

03 04 58 30 CMP YAW 2.

03 04 58 31 LMP Got it.

03 04 58 32 CMP PITCH 2.

03 04 58 33 LMP Got it.

03 04 58 34 CMP Rotation number 1.

03 04 58 35 LMP Okay.

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03 04 58 36 CMP YAW 1.
03 04 58 37 LMP Got it.
03 04 58 38 CMP PITCH 1.
03 04 58 39 LMP Got that one.
03 04 58 40 CMP Okay. TVC SERVO POWERS, OFF.
03 04 58 43 CDR Okay.
03 04 58 44 CMP MAIN BUS TIES, OFF.
03 04 58 45 CDR MAIN BUS TIES, OFF.
03 04 58 46 CMP PRO.
03 04 58 48 LMP A's OFF.
03 04 58 49 CMP Beautiful.
03 04 58 52 LMP And B's OFF.
03 04 58 53 CDR ... zero ...
03 04 58 57 CMP Minus 2.4.
03 04 58 59 CDR ...
03 04 59 00 CMP Okay.

TIME SKIP

03 05 02 05 CDR Just so we'll be there. And I need to do a P51 ...
Okay. ... six.
03 05 02 21 CMP And I tell you. I want to hang on to some sort of
alinement. Tenaciously!
03 05 02 36 CC 14, Houston.
03 05 02 38 LMP Go ahead.
03 05 02 41 CC We would like AUTO on the high gain now, Ed. And
just one other question. Did you mean you tried

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four times on the SECONDARY SERVO ELECTRONICS to get locked up?

03 05 02 52 LMP Yes, it was about that, Fredo. It could be that I wasn't giving it enough delay time before I tried something else, when it was in the NARROW position. But I thought I was, and I don't know what I did differently on the last attempt that did work than the previous attempts which didn't work.

03 05 03 11 CMP Okay. We have a good GDC alinement. All right, we're going to maneuver, leader.

03 05 03 17 CC Okay. You tried to lock up in NARROW rather than WIDE. Is that correct?

03 05 03 23 LMP Roger. I went from WIDE to MEDIUM to NARROW.

03 05 03 27 CC Okay.

03 05 03 32 CMP ... WIDE dead band ... WIDE dead band ... with a little gas ...

TIME SKIP

03 09 42 54 CDR S-IVB lunar impact, 83:07.

03 09 43 09 LMP Go ahead.

03 09 43 20 LMP Roger, Fredo. Thank you.

03 09 43 57 CMP We're in - -

03 09 43 58 CDR Okay, within 1 second.

03 09 43 59 CMP Yes.

03 09 44 22 CDR I can see the ... blowing at me.

03 09 44 28 CMP Double up ...

03 09 44 36 LMP ...

03 09 44 46 CMP There's an eclipse after we get back.

03 09 44 48 CDR Okay.

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03 09 44 53 MS ...

03 09 44 58 CDR Okay. We're through the flight plan. We're on your card.

03 09 45 03 LMP Okay.

03 09 45 12 CDR We'll wait until 54.

03 09 45 24 LMP Man, there are a lot of stars out here in one sector of the sky.

03 09 45 30 CDR What sector are you looking at?

03 09 45 32 LMP ...

03 09 45 47 LMP I don't see a sector where there's not any. Usually I don't see them. Oh, the stars?

03 09 45 58 CMP Yes.

03 09 45 59 LMP Yes. I've got the Big Dipper floating along beside me out here for some time. Could have gone on around Arcturus, Spica, and Gienah. And I can just barely see the Little Dipper up behind us.

03 09 46 17 CDR Okay. Which of those stars can you see now? Can you see the fifth-magnitude star?

03 09 46 21 LMP Of the Little Dipper?

03 09 46 23 CDR Right.

03 09 46 25 LMP Let's see. I can just barely see anything at all there.

03 09 46 29 CMP It goes 2, 3, 4, 5. Right?

03 09 46 33 LMP No, I really can't say I can see it, Al. But - -

03 09 46 38 CMP 2.

03 09 46 39 LMP - - it may be the angle - -

03 09 46 40 CMP 3, 4, 5.

03 09 46 41 LMP - - It may be the angle that I'm - at the window, one reason.

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03 09 46 50 CDR I think that's it. Anyway, it's obvious, when you look at them, which it is.

03 09 46 54 LMP That's the one you have to strain to make out.

03 09 47 05 LMP I think this has been a long damn SIM. The son of a bitch.

03 09 47 28 CDR Showing about a degree drift in yaw. That dead banding on the GDC is ...

03 09 47 35 CMP It could be dead banding up around half a degree. I'm not sure what it was then I - I mean, we could be a half a degree off from where I - gaged it.

03 09 47 52 CDR Okay.

03 09 47 54 CMP GDC's been on there now ever since we got the attitude, which has been a good while, 25 minutes or so. Okay. I'll go ahead and cage them up. I got to get back on my card here. Aline the GDC after we - Can't do it now.

03 09 48 25 LMP Huh?

03 09 48 26 CMP So, I'll do it now and then.

03 09 48 31 CDR Did it move at all?

03 09 48 32 CMP Yes, no trouble. A degree or so.

03 09 48 38 CDR ...

03 09 48 56 LMP I can see the fifth-magnitude star now. Yes.

03 09 49 01 CDR Good - clear air here.

03 09 49 39 CDR Okay. About 1 minute to bus ties.

03 09 50 13 CMP Well. ...

03 09 50 16 CDR Okay. Why don't you go ahead and bring the bus ties on, Ed?

03 09 50 20 CMP We're 20 seconds early.

03 09 50 22 LMP A is on. B is on.

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03 09 50 26 CMP Is your intercomm on?

03 09 50 29 CDR Okay - -

03 09 50 30 LMP Yes.

03 09 50 31 CDR - - TVC SERVO POWER 1, AC 1.

03 09 50 32 CMP Okay.

03 09 50 33 CDR 2, AC 2.

03 09 50 34 CMP Okay.

03 09 50 35 CDR RHC POWER, NORMAL, two, AC; DIRECT, two, OFF.

03 09 50 40 CMP OFF.

03 09 50 41 CDR BMAGs, three, one-half.

03 09 50 43 CMP Okay. Go ahead.

03 09 50 45 CDR Okay. SPACECRAFT CONTROL, SCS; RHC 2, armed.

03 09 50 48 CMP SCS and RHC, armed.

03 09 50 49 CDR Bring on number 1's.

03 09 50 51 CMP We're a minute early. Let's save a little more time ...

03 09 50 55 CDR Okay.

03 09 51 05 CMP Please don't wear them out until after TEI (Yawn).

03 09 51 18 CDR ...

03 09 51 23 CMP By all means.

03 09 51 38 CMP Okay. Are you ready for number 1? ...

03 09 51 42 LMP Any time.

03 09 51 43 CMP Okay. PITCH 1 is on.

03 09 51 45 LMP You have it.

03 09 51 46 CMP YAW 1 is on.

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03 09 51 47 LMP You have that one.

03 09 51 48 CDR Verify trim control and set. Plus 0.9.

03 09 51 51 CMP 0.9.

03 09 51 52 CDR Minus 0.33. Verify MTVC, both sides. Do you have them? Okay.

03 09 52 02 CMP No MTVC.

03 09 52 04 CDR No MTVC.

03 09 52 05 CMP Are you ready for number 2?

03 09 52 06 LMP Bring them up.

03 09 52 07 CMP PITCH 2.

03 09 52 08 LMP You got it.

03 09 52 09 CMP Got them. YAW 2.

03 09 52 10 LMP You got that one.

03 09 52 13 CDR Okay. Set trim. Plus 0.9, minus 0.33.

03 09 52 19 CMP Okay. That's set.

03 09 52 20 CDR LHC, neutral. Verify no MTVC and verify zero.

03 09 52 25 CMP Okay, no MTVC.

03 09 52 28 CDR Very good.

03 09 52 29 CMP Verify zero.

03 09 52 30 CDR RHC POWER, NORMAL, too, AC/DC.

03 09 52 35 CMP Okay.

03 09 52 36 CDR DIRECT, two, MAIN A/MAIN B.

03 09 52 38 CMP MAIN A/MAIN B.

03 09 52 39 CDR Okay. BMAGs, 2.

03 09 52 40 CMP Okay. Right on through. We're okay.

03 09 52 51 CDR Okay. It's there, and steady.

03 09 52 53 CMP Not yet. Okay, the rates are coming off.

03 09 53 04 CMP Okay. It looks like it's pretty happy.

03 09 53 05 CDR Yes. BMAGs, one-half.

03 09 53 07 CMP One-half, and let me GDC aline here.

03 09 53 09 CDR Okay.

03 09 53 12 CMP Okay. We got 000.

03 09 53 15 CDR Gimbal test option.

03 09 53 17 CMP Okay.

03 09 53 18 CDR GO.

03 09 53 19 CMP 2, 02, 0, up 2, down 2, 0.

03 09 53 30 CDR 0.9 and minus 0.33.

03 09 53 35 CMP Okay. She's at trim.

03 09 53 36 CDR Okay. She's in trim. FDAI SCALE, 5/5.

03 09 53 40 CMP 5/5.

03 09 53 43 CDR RATE, HIGH.

03 09 53 44 CMP Okay. RATE is HIGH.

03 09 53 46 CDR Check the DET. Should be reading 25:07, 08, 09, 10.

03 09 53 53 CMP Okay. Half a second off.

03 09 53 55 CDR SPS HELIUM VALVES, Ed. Check two, AUTO. Verify.

03 09 53 59 LMP AUTO, barber pole.

03 09 54 00 CMP Okay.

03 09 54 01 CDR Check N₂ A and N₂ B.

03 09 54 03 LMP They're both good. Helium's good.

03 09 54 07 CDR Okay. Waiting for 2 minutes.

03 09 54 12 CMP Okay.

03 09 54 26 CDR I think we're in good shape. Everything's in the right place.

03 09 54 31 LMP Have you already called HIGH - HIGH BIT RATE?

03 09 54 35 CMP That's in 2 minutes; not yet.

03 09 54 36 LMP Okay.

03 09 54 41 CDR Okay. Bring on bank A.

03 09 54 43 CMP Bank A is on.

03 09 54 45 CDR THC, ARMED. We do not need that RHC 2 ARMED.

03 09 54 48 CMP Okay.

03 09 54 49 CDR TAPE RECORDER, HIGH BIT RATE, RECORD, FORWARD. COMMAND RESET.

03 09 54 51 LMP Okay.

03 09 54 54 CMP There's sunrise.

03 09 54 57 LMP So it is.

03 09 55 00 CMP Okay. Okay.

03 09 55 04 CDR It looks about right. Right on time.

03 09 55 07 CMP You're HIGH BIT RATE, Ed.

03 09 55 09 LMP You got it.

03 09 55 10 CDR You got a gray.

03 09 55 11 LMP Got a gray.

03 09 55 12 CDR Okay.

03 09 55 13 CMP I think I'll wait for the burn.

03 09 55 19 CDR Standing by for an EMS MODE, NORMAL, ... - -

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Day 4

03 09 55 21 CMP I think that's all we missed. Okay. One-half, ATT SET; RATE COMMAND; COMMAND's HIGH: THC POWER there, there; CMC, AUTO; ATT 1/RATE 2, BMAGs; looks good. There, and we have SERVO POWER.

03 09 55 33 CDR Okay. And there's to be no ullage.

03 09 55 36 CMP No ullage.

03 09 55 40 CDR And no trim.

03 09 55 45 CMP One minute to burn time, troops.

03 09 55 49 CDR Okay.

03 09 55 51 CMP Ten. ... Is it 10 - -

03 09 55 55 CDR Ten seconds. ...

03 09 55 59 LMP Okay. Nominal is 6 plus 12.

03 09 56 02 CDR Burn time plus 10.

03 09 56 03 CMP Okay. Crossover around 4 plus 10 ... - -

03 09 56 07 CDR Okay. DSKY is on time.

03 09 56 09 CMP ...

03 09 56 13 CDR Okay. AVERAGE g. EMS MODE, NORMAL.

03 09 56 15 CMP EMS mode is NORMAL.

03 09 56 17 CDR R₃ looks good.

03 09 56 19 CMP Okay.

03 09 56 22 CDR ... three counts. 20 seconds.

03 09 56 32 CDR 10, 9, 8, 7, 6, 5, PRO, 3, 2, 1 -

03 09 56 42 CDR 0. We have IGNITION on time.

03 09 56 44 CMP Okay.

03 09 56 45 LMP Okay. You have A and B.

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03 09 56 46 CMP Okay. P_C is 96.

03 09 56 48 CDR Both tanks lock good.

03 09 56 52 CMP Okay. Steering is good.

03 09 56 54 CDR Steering is good; GDC ball's good; needle is good.

03 09 56 57 CMP She's steady as a rock. P_C 's up to 100.

03 09 57 04 LMP Okay. You're still in tight limits.

03 09 57 05 CMP We got the light before we got the bang that time. I saw it. I hadn't noticed that on midcourse 2. She's steady. GDC BMAGs are good.

03 09 57 17 CDR Okay ... - -

03 09 57 18 LMP Okay. We're at loose limits - loose limits.

03 09 57 21 CMP Loose limits. Okay. P_C 's 100.

03 09 57 25 CDR Loose limits. Give me a mark on 5 minutes to go, Ed.

03 09 57 29 LMP Okay.

03 09 57 31 CMP P_C 's 100. Steering is good.

03 09 57 34 CDR Yes. Steady as a rock.

03 09 57 39 CMP P_C 's increasing. Coming up nicely.

03 09 57 48 CMP Smooth - -

03 09 57 49 LMP Okay. Stand by.

03 09 57 53 LMP MARK. Five minutes.

03 09 57 56 CDR Okay. Not bad - CMC is within 4 seconds of that. Four seconds fast.

03 09 58 07 CMP And P_C is steady. Steering good. We're oscillating in the roll dead band.

03 09 58 13 CDR Yes.

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03 09 58 15 LMP You're okay now.

03 09 58 17 CMP Yes.

03 09 58 22 CDR CMC and EMS are together.

03 09 58 28 LMP Okay, I shifted the OXIDIZER FLOW VALVE. Should be seeing it.

03 09 58 35 CMP What did it stabilize at?

03 09 58 37 LMP It stabilized about - oh, minus 150.

03 09 58 39 CMP Okay. Switch to 200.

03 09 58 40 LMP 200.

03 09 58 41 CMP You're in NORMAL.

03 09 58 42 LMP Yes.

03 09 58 43 CMP Okay.

03 09 58 46 LMP Okay, I'm coming up on 4 minutes to go.

03 09 58 48 CMP Okay.

03 09 58 54 LMP MARK; 4 minutes.

03 09 58 57 CDR Okay, about right on, as far as the CMC is concerned. Okay, CMC and EMS are close together.

03 09 59 06 CMP She's really smooth, steady.

03 09 59 08 CDR Yes.

03 09 59 10 CMP Just like the CMS. Only difference being out this window, why - I can see it with peripheral vision.

03 09 59 19 CDR Okay, we've got steering; you're down about a degree in pitch.

03 09 59 23 CMP All right. Sounds real normal.

03 09 59 26 CDF Okay.

03 09 59 29 CMP And the GDC and the BMAGs all agree with that. Everything's GO. ...

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03 09 59 41 CDR Okay. EMS and DELTA-V are together. Give me a mark on 3, Ed.

03 09 59 45 LMP Okay. Stand by - -

03 09 59 54 LMP MARK.

03 09 59 55 CMP Is the PU valve coming back toward ...?

03 09 59 57 LMP That's affirm. Bringing her back down.

03 10 00 01 CMP Okay.

03 10 00 02 LMP You're in MAX.

03 10 00 03 CMP I'm up to 105.

03 10 00 10 CDR Okay. Dead-banding in roll again; everything else looks good.

03 10 00 19 LMP Okay, helium and nitrogen are GO.

03 10 00 23 CDR CMC and DELTA-V are within a couple of seconds of nominal burn time. We may be a little long by a couple of seconds. We'll see.

03 10 00 33 CMP Well, we had low, you know - It took the P_C a little while to get up there. I think you know that the pressures were down.

03 10 00 40 CDR Yes.

03 10 00 42 CMP I guess they're okay now. They increased much, Ed?

03 10 00 46 LMP The pressures and ullage stayed just about the same; they haven't really moved.

03 10 00 49 CMP Okay, we should have crossover shortly.

03 10 00 51 LMP Okay, we're getting it; and I'm seeing evidence of it now.

03 10 00 56 CMP Okay, I didn't really see a 2- to 3-psi increase here; did your valve go to INCREASE?

03 10 01 01 LMP It's in INCREASE now.

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03 10 01 02 CMP I meant the indicator.

03 10 01 04 LMP Yes.

03 10 01 05 CMP It did?

03 10 01 06 LMP Yes.

03 10 01 07 CMP Okay. We definitely had it. ... didn't see that.

03 10 01 10 LMP Yes, it's moving that way right now, Stu. You mean the balance indicator - UNBALANCE indicator?

03 10 01 15 CMP Yes.

03 10 01 16 LMP No, it is not in INCREASE yet. Okay, I'm going to NORMAL.

03 10 01 35 CMP Judging from P_c , I'd say we hadn't had crossover, but the time - -

03 10 01 38 LMP Yes.

03 10 01 39 CMP - - we sure have.

03 10 01 40 LMP The - time says we should have had - -

03 10 01 41 CMP Yes.

03 10 01 45 LMP It was a nice smooth one ... - -

03 10 01 46 CDR Give me a mark at 1 min?

03 10 01 48 LMP Okay. Stand by.

03 10 01 52 LMP MARK; 1 minute.

03 10 01 53 CDR Right on.

03 10 01 54 LMP Okay - -

03 10 01 55 CMP What's - Ed, what's the balance meter read?

03 10 01 58 LMP Balance is zero, and I'm going to INCREASE and leave it there for the last part of the burn.

03 10 02 02 CMP Okay.

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03 10 02 05 CDR Okay. Looks like the CMC's right on.

03 10 02 09 LMP Okay.

03 10 02 11 CDR We're GO for CMC cut-off. Okay, Ed, counting down to zero.

03 10 02 17 LMP All right.

03 10 02 22 LMP MARK; 30 secnds.

03 10 02 24 CDR Okay, it's going to be real close.

03 10 02 25 LMP Yes. We're in tight limits ... I'm going to go all the way.

03 10 02 30 CDR Okay, cut down - count down to zero.

03 10 02 32 LMP All right.

03 10 02 42 LMP Ten seconds.

03 10 02 44 CDR Going to be a little bit early on the cut-off.

03 10 02 46 LMP 5, 4, 3, 2, 1 -

03 10 02 52 LMP MARK.

03 10 02 53 CMP Okay, we've had SHUTDOWN. DELTA-V - -

03 10 02 54 CDR Okay, CMC blanks.

03 10 02 55 CMP - - THRUST A and B, OFF.

03 10 02 56 LMP Okay. Everything's good over here.

03 10 02 58 CMP Stand by for gimbal motors.

03 10 03 06 LMP Got it.

03 10 03 07 CMP YAW 2.

03 10 03 08 LMP You got it.

03 10 03 09 CMP PITCH 2.

03 10 03 10 LMP You got it.

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03 10 03 11 CMP YAW 1.

03 10 03 14 LMP You're too fast for me.

03 10 03 15 CMP Okay, YAW 1 back on.

03 10 03 17 LMP I got it.

03 10 03 18 CMP It's on now; are you ready?

03 10 03 20 LMP Okay.

03 10 03 21 CMP YAW 1.

03 10 03 22 LMP Okay.

03 10 03 23 CMP You ready - PITCH 1?

03 10 03 24 LMP Yes.

03 10 03 25 CMP PITCH 1.

03 10 03 26 LMP Okay.

03 10 03 27 CMP Okay. TVC SERVO POWER, 1, 2, OFF.

03 10 03 29 LMP 1 and 2's OFF.

03 10 03 31 CDR MAIN BUS TIES, OFF, Ed.

03 10 03 33 CMP Okay.

03 10 03 35 LMP ... 0.3 residual.

03 10 03 37 CDR BUS TIES are OFF.

03 10 03 40 CMP Okay. DELTA-V to STANDBY; OFF.

03 10 03 41 LMP Okay. Roll.

03 10 03 44 CDR Oh, beautiful!

03 10 03 46 CMP Look at those residuals.

03 10 03 47 LMP Plus 0.3, 0, and 0.

03 10 03 59 CDR ... How about them apples!

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03 10 04 02 LMP Oh, man, look what's out that window, too.

03 10 04 05 SC ...

03 10 04 11 CMP Hey, let's - let's wrap up the checklist - -

03 10 04 12 CDR Yes.

03 10 04 13 LMP Yes.

03 10 04 14 CMP - - and then we'll get to an attitude.

03 10 04 15 LMP Yes.

03 10 04 17 CDR Okay, let's see. We don't ... We do not null; we recorded that; EMS FUNCTION; you got all that.

03 10 04 21 CMP PCM BIT RATE, LOW, Ed.

03 10 04 23 LMP I'm on LOW.

03 10 04 24 CMP All right. Okay, a VERB 66.

03 10 04 30 CDR Okay, you got - That's on OFF. All right ... direct ... - -

03 10 04 34 CMP I got DIRECT ULLAGE.

03 10 04 35 CDR Okay.

03 10 04 36 CMP PITCH 1 and YAW 1 are open; I got BMAG to RATE 2; and Ed's on LOW. Okay. VERB 48 ENTER.

03 10 04 41 LMP You got a VERB 66, huh?

03 10 04 43 CMP Roger. VERB 21 ENTER, 21111, right?

03 10 04 48 LMP Right.

03 10 04 49 CDR And we're still B/D ROLL, too.

03 10 04 50 CMP B/D ROLL. ... PRO, PRO, PRO. Okay.

03 10 04 56 CDR Comm attitude. Did you get an update on this yet?

03 10 05 01 LMP On comm attitude? No.

03 10 05 02 CDR Okay. Load plus 0, plus 176, 0 - all zeros.

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03 10 05 08 CMP Yes. I think it was - -

03 10 05 13 CDR Plus 176, 00, plus all zeros.

03 10 05 21 CMP Okay, 00, 176, 0.

03 10 05 24 CDR Yes, that's it.

03 10 05 25 CMP CMC; RATE 2; RATE COMMAND. Next maneuver.

03 10 05 28 CDR Okay.

03 10 05 33 CMP Okay. Wide dead band, I'll take in a minute.

03 10 05 40 CDR You have DELTA-T_{ig} of zero; burn time was about
1 second short, I'd say, huh? ...

03 10 05 51 LMP Burn time - I had it 1 second early.

03 10 05 56 CDR Plus 11. Okay.

03 10 06 03 LMP Okay. Your fuel - oxidizer and fuel?

03 10 06 06 CDR Yes.

03 10 06 07 LMP I have - fuel is 35.1; oxidizer, 34.9; and about
a minus 40 - decrease.

03 10 06 19 CDR 40 decrease.

03 10 06 23 CMP Looks like a plaster-of-paris cast.

03 10 06 25 LMP It sure does, doesn't it?

03 10 06 26 CMP It doesn't even look real.

03 10 06 30 LMP ...

03 10 06 33 CDR It's absolutely ...

03 10 06 37 CMP I wish there was some other word besides "fantastic"
to describe it. But it does, it looks like some-
body has made a cast and poured it out there.

03 10 06 48 LMP It's really there.

03 10 06 49 CDR Really wild.

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03 10 06 50 CMP Man, I'll tell you, at this Sun angle, I won't have any trouble recognizing my landmarks. I haven't set myself up yet, but - -

03 10 06 56 LMP Are we maneuvering?

03 10 06 58 CMP Yes, we're maneuvering.

03 10 06 59 CDR That had to be a hell of a good burn; we figured that tailout was going to be 7.0 - it was 7.3 - -

03 10 07 06 CMP And you know, I - I saw it slip once - -

03 10 07 09 CDR And we had plus 0.3 to go; so that means - -

03 10 07 12 CMP I saw it slip once, so it's probably 7.2 - -

03 10 07 15 CDR Yes.

03 10 07 16 CMP - - at least - -

03 10 07 17 CDR Yes. That's sighting with an 0.3 on tthe V_{GX} .

03 10 07 21 CMP Not bad.

03 10 07 27 LMP What are you looking for?

03 10 07 28 CMP Yes, that map. Let's see, what was 180 ... time ... Al?

03 10 07 34 LMP I'll check. 38:30.

03 10 07 41 CMP 38:30. We're about 9 minutes.

03 10 07 49 LMP Not quite - Yes. Almost 10 minutes; 9 minutes and 40 seconds. Did you find the location?

03 10 08 15 CMP Okay.

03 10 08 37 CMP Oh, brother. ...

03 10 08 51 CMP Okay, there are the Loveletts. See, right straight over your head, there's two craters that got sort of - You have to look - You can probably see them out your window, Ed. The two complete craters with the ridges in the bottom? Yes.

03 10 09 12 LMP Yes.

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03 10 09 13 CMP Those are called the Loveletts.

03 10 09 14 CDR ...

03 10 09 16 CMP Yes, from the copulating craters. Off to your right, you'll see Mendeleev, the big huge - -

03 10 09 28 LMP Yes. Let's see. Turn around and look back along the track now, 180.

03 10 09 38 CMP Okay, let me turn over ...

03 10 09 56 CDR ...

03 10 09 58 LMP Pardon?

03 10 10 04 CMP Well, I can't see the Loveletts yet; I'll just turn over here.

03 10 10 12 LMF Okay, did anybody start a time?

03 10 10 16 CMP Huh?

03 10 10 17 LMP That's Mendeleev back - that we've already crossed over, isn't it? Right back - -

03 10 10 22 CMP Yes.

03 10 10 23 LMP - - there - that big son of a gun.

03 10 10 25 CMP Say, Ed.

03 10 10 26 CDR Yes ... the crater ...?

03 10 10 27 LMP Yes.

03 10 10 29 CMP Which way are we going?

03 10 10 30 LMP We're going this way.

03 10 10 31 CDR Yes, okay.

03 10 10 37 LMP And, let's see, you should have Tsiolkovsky over on your - your side here very soon, Stu. Right?

03 10 10 48 CMP Yes. Well, in a little bit.

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03 10 10 50 LMP It's - Yes, we're not quite there yet. Did you start a clock? I'm sorry.

03 10 11 00 CDR No.

03 10 11 02 LMP Okay, I'll see if I can start one.

03 10 11 06 CDR Well, we can start one.

03 10 11 07 LMP Let's start one just to keep track. And set it on - We'll set it on the time from 180, A1.

03 10 11 18 CDR Okay ...

03 10 11 22 LMP Yes, 38:30. Set it on - set it on 15 minutes, or 14 minutes - 38.

03 10 11 32 CDR Hey, wait a minute; we got the damn clock running at 14. How about that? Can you give me a mark on 15? ... It's beautiful.

03 10 11 41 LMP Okay; 12:38 - Let's see - Time is 38:30. So, if I take - -

03 10 11 56 CDR It would be ...

03 10 11 59 LMP Yes. Why don't you get it 14 if you got - get it at 30 seconds.

03 10 12 03 CDR Okay.

03 10 12 14 CDR Fourteen.

03 10 12 15 LMP Stand by. You've got 15 seconds.

03 10 12 29 LMP MARK.

03 10 12 31 CDR Okay, we got GET running.

03 10 12 38 CMP GET from the 180?

03 10 12 41 LMP Yes.

03 10 12 42 CDR Yes.

03 10 13 39 LMP Man, oh man.

03 10 13 51 CMP Tsiolkovsky's coming up on this window.

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Day 4

03 10 13 53 LMP Tsiolkovsky's coming up on that one?

03 10 13 55 CMP Yes.

03 10 14 40 CDR There's Mendeleev. ...

03 10 15 08 LMP I want to get around here and get a burn report off.

03 10 15 29 LMP 56, 1 minute.

03 10 15 42 CDR Minus 15 seconds.

03 10 15 44 LMP Okay. That's where we've got it.

03 10 15 48 CDR ...

03 10 15 56 CMP ... by number 1 zero-phase target.

03 10 16 01 CDR Did you?

03 10 16 02 CMP Yes. ... you can see, bigger than shit.

03 10 16 04 CDR Not zero-phase right now?

03 10 16 05 CMP No, but - I mean that - -

03 10 16 06 LMP ...

03 10 16 10 CMP ... say something to accommodate ...

03 10 16 24 LMP Houston, Apollo 14.

03 10 16 34 CDR Okay, Fredo. We had an extremely fine burn. The burn report as follows: burn time, 6 plus 11; residuals, 0.3 plus, 0, and 0; DELTA-V_C is minus 7 - -

TIME SKIP

03 11 40 32 CDR Go ahead.

03 11 41 02 CDR Yes.

03 11 41 16 LMP Man, that was a sharp dropoff.

03 11 41 24 CMP About TEI ...

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03 11 41 38 LMP Okay. I have RECORD, FORWARD, LOW RIT BATE - LOW BIT RATE, and COMMAND RESET.

03 11 41 46 CMP Did they start the tape, or did you have to?

03 11 41 48 LMP We started it.

03 11 41 52 CMP I'm supposed to do that. ...

03 11 42 02 CMP That's a ...

03 11 42 23 LMP Okay.

03 11 42 32 LMP Okay. I've got it right here.

03 11 43 03 LMP Okay. And we're lunar orbit ... Use normal lunar configuration. Here we go. PRIM; PRIM; HIGH; VOICE; PCM; RANGING; DOWNVOICE BACKUP, TAPE, OFF; DATA, NORMAL. VHF, off, off; VHF, RECEIVE ONLY, OFF; VHF RANGING, OFF; PCM/ANALOG; RECORD; FORWARD; NORMAL; NORMAL; LOW; OFF; POWER ...

03 11 44 34 LMP Okay.

03 11 44 44 LMP Okay. It looks very good to me.

03 11 44 52 CDR ... normal lunar configuration.

03 11 44 54 LMP Okay. I set normal lunar configuration. PURGE LINE HEATERS, on.

03 11 45 00 CDR ...

03 11 45 02 LMP 31?

03 11 45 03 CDR ... 32 ...

03 11 45 11 LMP Yes.

03 11 45 12 CDR Okay. ... purge ... and we got ...

03 11 45 37 LMP Okay. And what angles do I have? ... on OMNI C?

03 11 45 50 LMP Okay. If anybody wants to use the Myrtle, we ought to use it before we get a - -

03 11 45 56 CDR ...

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03 11 45 58 LMP - - before the ... and we need to make this waste water dump on the backside. ...

03 11 46 22 LMP I'd like (cough) - Let's see what our waste water tank shows. We've got 60 percent. Man, that's ...

03 11 46 35 LMP Yes.

03 11 46 38 CMP Well, I'm not going to do the sightings until just before the terminator - on the other side. We got the whole frontside pass, and we do want the - they wouldn't want any dump - dumping across the frontside, I don't think ...

03 11 46 49 LMP No. No. Definitely not.

03 11 47 07 LMP Well, they should keep their schedule on the backside, too.

03 11 47 32 LMP Okay.

03 11 47 51 CMP No - No, I - I'm making a fast pass on the garbage can, but a little high in trajectory.

03 11 49 22 LMP We ... the pass ... the backside pass after this one.

03 11 49 31 CMP Yes.

03 11 49 39 CDR Okay. ...

03 11 49 54 CMP No, what this is, is - we'll maneuver - we won't - Yes. We won't be torquing the vehicle to waste gas. This will just be a look at our landmark for a similar-type approach for tracking after SEP tomorrow, for the landing, and from the low altitude. Give me a hack at acquisition time. Even though on the actual tracking, you torque your spacecraft at 2 degrees per second. ... will become a problem. Okay. Here's the Hycon for the top - topo.

03 11 50 39 CDR Right on Descartes.

03 11 50 50 CDR If you leave it up ... Descartes again, huh? Wait a minute.

03 11 50 56 CMP No. You go to sleep after that one.

CONFIDENTIAL

03 11 50 59 CDR How are you supposed to configure the camera here? Okay. Your trigger's here and you actually photograph it there. And - ... eat and go to sleep. You ...

03 11 51 32 LMP Yes. That's ... while we're waiting.

03 11 51 38 CDR ...

03 11 51 41 LMP I just want to see the ...

03 11 51 43 CDR Yes ...

03 11 51 44 CMP About 100 hours, we wake up. Somewhere in that time frame.

03 11 51 48 LMP See what Stu's doing. See what kind of conflict we're really going to have in - getting dressed and that sort of thing.

03 11 51 54 CDR We actually - rest period officially ends at 99:30. The eat period - ... 20 ...

03 11 52 24 LMP Just a minute.

03 11 52 27 CDR That was a bit vague at that point.

03 11 52 29 LMP Yes.

03 11 52 42 CDR And we got the IM transmitter lights ... out.

03 11 52 59 CDR POO update. And - right here might give you some trouble. ... power ...

03 11 53 13 LMP Roger. Getting into ... now. Tried to look for -

03 11 53 33 CDR Okay. Let's see.

03 11 53 47 CDR 101:50 ... in the IM.

03 11 53 53 LMP Time we start activation, huh? 101:50. That's 16 hours from now. Not very long.

03 11 54 25 CDR Yaw is ... - -

03 11 54 26 LMP ...

CONFIDENTIAL

Day 4

03 11 54 27 CDR Pitch - pitch is supposed to be out, and yaw is supposed to be in. ... start ... Get those babies all hooked up. ...

03 11 55 02 LMP Al, what you looking for? Okay. They're all - all of those are in the flight data bag. These are on the suits.

03 11 55 19 CDR Yes. We can't talk it over now, because we're going to have get ...

03 11 55 22 LMP Okay. Everything's off.

03 11 55 25 CMP ... Okay. CMC, FREE and then AUTO on the VERB 48. You got the purge line heaters on?

03 11 55 38 LMP Yes.

03 11 55 42 CDR Okay, CMC, FREE - that's AUTO.

03 11 55 50 LMP ... and I got 15 minutes.

03 11 55 53 CDR ... 3, VERB 4 ... - -

03 11 55 54 LMP ... Myrtle here.

03 11 55 59 CDR We still want to do a B/D roll, won't we?

03 11 56 02 CMP Yes, might as well.

03 11 56 04 CDR I'm going to load 2110. Okay?

03 11 56 11 CMP Before you - Hold it just a second before you ENTER. Let me do that one more time, just to make sure we didn't get out of - Okay. Now enter it. Okay.

03 11 56 24 CDR What did you do that for?

03 11 56 26 CMP Well, see, we're in a 5-degree dead band.

03 11 56 27 CDR Yes.

03 11 56 29 CMP If you change that - if you change that to a narrow dead band, it will immediately fire and bring you over to the center of that 5-degree dead band. What cycling this to FREE and AUTO does is - it centers the dead band.

CONFIDENTIAL

03 11 56 41 CDR I already did it once before I called up the
48 ... - -

03 11 56 43 CMP Well, I was noticing the roll - the drift up. See,
you're going to a - a half a degree dead band - -

03 11 56 48 CDR ... drifted off.

03 11 56 50 CMP - - so, anything - more than a half a degree will
cause a jet to fire.

03 11 56 53 CDR Yes, okay. It was off half a degree?

03 11 56 56 CMP Well, you know, what - what's a half a degree. It
was off a little bit.

03 11 57 00 CDR The att - it was actually rolling apparently.

03 11 57 04 CMP Yes, we're - you know, we're - we were drifting in
a 5-degree dead band. It's just that I'm real -
See, we just had a firing there. Yes, after we sat
there and talked about it. It's - it's the PRO on
that 21101. Son of a gun. See, we just wasted
some gas. We were talking about it.

03 11 57 33 CDR We were talking ... ?

03 11 57 36 CMP Yes. But see, if you're moving, you've established
it at that point. But then, if you're drifting
along - and I should have remembered that, as many
times as I've ... watched that. Anyway, you ENTER;
and then when you PRO on - on the 21101, what you're
doing is, you're shrinking your phase plane now to
a half a degree dead band. But you don't change
the center.

03 11 58 06 CDR You change your center by going to FREE - -

03 11 58 07 CMP Yes.

03 11 58 08 CDR - - and back to AUTO.

03 11 58 11 CMP See, we had already drifted out, because we got
the firing.

03 11 58 13 CDR Yes. Okay. Well, we should have - -

03 11 58 15 CMP Just before we PROed - -

CONFIDENTIAL

03 11 58 16 CDR Just before you PROed - -

03 11 58 17 CMP Yes.

03 11 58 18 CDR - - not - not just before you ENTER.

03 11 58 20 CMP Yes.

03 11 58 21 CDR You had the right idea, but you did it the wrong way.

03 11 58 23 CMP Yes. Kind of.

03 11 58 26 CDR Okay. We're supposed to start the landmark tracking ... here.

03 11 58 38 CMP Okay.

03 11 58 39 CDR You can do that now ...

03 11 58 41 CMP Yes.

03 11 58 49 CDR Plus zero. ... if we load it that way?

03 11 58 54 CMP Yes, it should. Let's try it.

03 11 59 09 CDR How about that.

03 11 59 14 CMP Okay, we're CMC, AUTO.

03 11 59 16 LMP Do you want to use Myrtle, Al?

03 11 59 18 CDR Yes; just a second, Ed.

03 11 59 21 CMP Ready to go?

03 11 59 27 CDR Yes, I'll - I'll flush the water, Ed. I'll be right down there.

03 11 59 31 LMP Okay.

03 11 59 37 CDR And you can start the hydrogen and oxygen purge at 5 0. That's 10 minutes.

03 11 59 44 LMP Okay.

03 11 59 46 CDR And the waste water dump.

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03 11 59 52 LMP Okay. Get ... going.

03 11 59 54 CDR Do you want to use Myrtle, also?

03 11 59 57 CMP While it's in here, thank you. I don't really need - no, I don't really need - no, I don't need to. It's going to be awhile before I really get a chance to again. No, I talked myself out of it.

03 12 00 08 CDR Okay (laughter).

03 12 00 10 CMP You know, it wouldn't hurt us to get that waste water dump started.

03 12 00 13 LMP Yes. ... do it in a minute.

03 12 00 15 CMP ...

03 12 00 16 CDR Yes. I think ... be sure it's all out of the way, so it doesn't screw up your -

03 12 00 20 CMP Did you turn the heaters on any earlier, or did you turn them on right at 30?

03 12 00 24 LMP What, the hydrogen?

03 12 00 26 CMP No - yes.

03 12 00 28 LMP No - -

03 12 00 29 CDR Turned them on 3 minutes early.

03 12 00 30 CMP Okay. So we'll wait on that. But -

03 12 00 46 LMP This damn thing is ...

03 12 02 05 CMP Isn't that something? We - we got so shocked by looking up and seeing the Moon in the window, we didn't do a VERB 82 (laughter).

03 12 02 14 LMP ... have any doubts?

03 12 02 16 CMP No, not after a residual like that.

03 12 02 21 CDR No, everything was as advertised all the way down.

03 12 02 36 CDR As advertised all the way down. Okay ...

CONFIDENTIAL

Day 4

03 12 02 48 CMP No. Yes, my answer is no. Okay, what time is it? 42? Hell, let's get that water dump going. You ready, Ed?

03 12 02 58 LMP Yes, I'm ready.

03 12 03 01 CMP You ready for the valves?

03 12 03 03 LMP Let her rip.

03 12 03 19 CMP Okay. You want DUMP A?

03 12 03 22 LMP Let me have it.

03 12 03 24 CMP Okay. Ready, go. Cross off A.

03 12 03 32 LMP And there's sunup.

03 12 03 42 CMP When is AOS this REV? Did they give us a map - -

03 12 03 46 LMP They didn't. They - -

03 12 03 47 CMP I guess they ran out of time.

03 12 03 49 LMP - - let us get behind ...

03 12 03 50 CDR They gave us a map update, but they only gave it to us on the 180 degrees.

03 12 03 56 LMP We could extrapolate from the ... - -

03 12 03 57 CMP Oh, well - yes, the - at least as my - far as my Solo Book goes, the AOS/LOS was in a minute of - shown in the - on my Solo Book.

03 12 04 06 LMP ...

03 12 04 07 CMP All they do is read me the 180 time. So that's probably what they were doing here. In fact, I may have said that. If anybody would say that I said that, I would agree with them. ... not anywhere around the points of the Moon, are they?

03 12 04 34 LMP No ... can say what way we're pointing.

03 12 04 37 CDR We'll be up in the air, because the optics will be pointed down.

CONFIDENTIAL

03 12 04 41 LMP Yes.

03 12 04 42 CMP Man, let me see. I need to see the what maps? Oh, you put them - Yes - -

03 12 04 51 LMP I put up there.

03 12 04 52 CMP - - ... the REV 1. The thing is, that was - Okay. The first one up is going to be Mosting A. And, let me see, I should be getting my camera configured. Well, I have plenty of time to do that.

03 12 05 47 LMP What would the 180 time be, Stu, on this REV?

03 12 05 54 CMP 084:44:53.

03 12 05 59 LMP Okay.

03 12 06 01 CMP Al's starting the clock over here.

03 12 06 02 LMP One minute late. Yes, okay. ... 2 minutes.

03 12 06 10 CDR ... Okay.

03 12 06 56 CMP Well, I just missed it - I'll get it at three.

03 12 07 03 LMP Okay. H₂ purge heaters have been on 20 minutes. We'll have to start the oxygen purge and then a hydrogen purge.

03 12 07 29 LMP Okay.

03 12 07 30 LMP MARK. Mark, mark, mark.

03 12 09 16 CMP Boy, I'm sure glad we cut out that TV show.

03 12 09 23 LMP Yes.

03 12 09 26 CMP It really worried me, when I saw where it was. Glad we got sort of a pseudoexcuse - to cut it out.

03 12 10 29 LMP Yes, there it is.

03 12 10 41 CMP This is really something. The most unreal looking real thing I've ever seen. If that makes any sense (laughter).

CONFIDENTIAL

03 12 10 53 LMP Probably not.

03 12 10 58 CDR ... Yes, it is ... vegetation. Something as common reference, you know - familiar reference. So you don't know how far above you are. So it makes it look like the scale is ...

03 12 11 16 LMP Okay. Let's terminate waste water dump.

03 12 11 19 CMP Okay.

03 12 11 20 LMP Fuel cell purge is complete.

03 12 11 25 CDR ...

03 12 11 34 CMP Okay, we're through with this ... heater.

03 12 11 59 CDR Fuel cell purge.

03 12 12 01 LMP The on-line heater's off.

03 12 12 03 CDR CMC is ... line heater's off. Okay.

03 12 13 00 CDR ... we're in attitude, I guess.

03 12 13 02 CMP Yes, we are. Eight minutes.

03 12 13 34 CDR OMNI C at 05.

03 12 13 40 LMP Say again?

03 12 13 41 CDR OMNI C is getting up in 12 minutes.

03 12 13 43 LMP Okay.

03 12 13 45 CDR 05. Sure hope you get to use that blue bag tonight.

03 12 13 57 LMP You and me both.

03 12 13 58 CDR Whaaa!

03 12 14 19 LMP Bad.

03 12 14 22 CDR Yes ...

03 12 14 40 CMP We ought to be right over -

03 12 14 46 CDR ...

CONFIDENTIAL

03 12 14 48 LMP Stu, are we south of our tra - of the map I have?
Are we going over Keeler now, approximately?

03 12 14 56 CMP No, we're - -

03 12 14 57 LMP We're past Keeler.

03 12 14 58 CMP We're going over Minnez - Meinez or something like
that, which is just off to my left.

03 12 15 05 LMP Okay, okay. I know where we are.

03 12 15 18 CMP It's quite true that I see ... I don't know how
accurate that is from this high orbit. We're at
22620 ...

03 12 15 58 CDR ...

03 12 16 54 CMP There's our Loveletts again. Little Lovelett.
That's oriented like that. Okay. ... That is
Chaplygin. ...

03 12 17 11 LMP Which one's Chaplygin?

03 12 17 13 CMP It's off my side.

03 12 17 19 LMP Are we headed for Mendeleev?

03 12 17 22 CMP That should be over on your right.

03 12 17 24 LMP That's what I thought.

03 12 17 44 LMP Yes. There it is. The tracks are across the mid-
dle of it.

03 12 17 53 CDR Those are definitely secondaries in the center of
Mendeleev.

03 12 17 58 CMP I'm - that's not the current thinking.

03 12 18 01 LMP Isn't it?

03 12 18 02 CMP No.

03 12 18 06 LMP That's a crater chain.

03 12 18 07 CMP Crater chain. Right. Davy and -

CONFIDENTIAL

03 12 18 09 LMP Yes, you can sure get fooled easily, but it sure looks like a - batch of secondaries.

03 12 18 14 CMP ... crater chain hadn't ever seen it. It does make a difference, doesn't it?

03 12 18 19 LMP I'm not about to argue with them at this point.

03 12 18 22 CMP What am I supposed to be doing? 84:58. I'm not doing anything, just checking my camera. Okay.

03 12 18 34 CDR And null bias check.

03 12 18 39 CMP They didn't want me to do that. ... the backside.

03 12 18 43 CDR Huh?

03 12 18 44 CMP You should have done that in the dark.

03 12 19 47 LMP ...

03 12 20 01 CMP Hey, my - my ...

03 12 21 10 LMP Are we supposed to be doing any photography at all on this ...?

03 12 22 11 LMP I have got the crater King out here, Stu, if you were looking for it.

03 12 22 19 CMP Yes, that's one of our targets. That's one of Farouk's favorite craters.

03 12 22 25 LMP Pretty damn interesting one, too.

03 12 22 39 LMP Really an interesting one. Huh? That one ... looks like ... got a rugged one right out here - with the central peaks.

03 12 23 02 CDR ...

03 12 23 05 LMP Sure does. Really got a very complex central structure.

03 12 23 08 CMP It's got one of the biggest central peaks around. It's a very unusual crater. But there are some dark areas in it that Farouk has gone on record as saying they are dikes.

CONFIDENTIAL

03 12 23 37 CMP High Sun. That's one right down there; just shows how it dominates the whole photograph. Just an extremely bright crater. Sun angle just isn't high enough for you to see it here. ... Yes, they're mining it [?], I think.

03 12 23 58 CDR What's the name of that one?

03 12 23 59 CMP It has no name. I've called it the Bright One. This is Langemak that we're just going over right down here.

03 12 24 39 CDR It's got to be fairly fresh, too.

03 12 24 42 CMP Yes. It's a very bright crater.

03 12 24 49 LMP Hello, Houston; 14. Loud and clear.

03 12 25 02 LMP Okay. Give me a second.

TIME SKIP

03 13 06 07 LMP Hey, Al.

03 13 06 08 CDR Yes?

03 13 06 09 LMP The lineations down here cross the - no, I don't have a big enough chart to cover all this. But they just point right up toward Imbrium. This transition between -

03 13 06 31 CMP Okay. Thank you.

03 13 06 41 CMP Man, we ... - -

03 13 06 42 LMP Just need a wider chart is all.

03 13 07 22 CDR Fantastic. A wild view out here with the ... like that, pointing it ... Well.

03 13 07 37 LMP Damn it, Copernicus ought to be coming into view.

03 13 09 29 LMP ... Ooh.

03 13 09 32 CDR What?

CONFIDENTIAL

Day 4

03 13 09 33 LMP We are really up there.

03 13 09 40 CDR ... isn't it?

03 13 09 42 LMP Yes.

03 13 11 25 LMP ...

03 13 13 07 LMP Okay. That's Eratosthenes. Yes.

03 13 13 48 LMP Houston, 14.

03 13 13 55 LMP The beautiful sight on the crater Eratosthenes, Timarcus [sic], and Wallace. Timarcus [sic] is - I mean Timocharis - is just as - just on my horizon, as we approach the terminator. Eratosthenes is about halfway to the horizon. They are very stark. It's a magnificent sight.

03 13 14 47 LMP Okay. Back to work.

03 13 14 48 CMP Okay. Stand by 1.

13 13 24 45 CDR Okay. We want to get into 40 for a couple minutes before we have LOS, so they can take a look at it.

03 13 25 04 CMP It might be for the P52, too. See, if we didn't have a roll, I don't know whether it would be a ... or not. Shouldn't be. ... Well, I won't try to figure that out.

03 13 25 19 CDR I don't think the roll off ... called 40.

03 13 25 25 CMP Yes. Okay. I need - ... I hook every time that come - -

03 13 25 31 Still maneuvering. What?

03 13 25 32 CMP I was just saying, I hook every time I come out of there. I can get my sextant out here.

03 13 25 37 CDR Still maneuvering here.

03 13 25 38 CMP Yes. Getting family close.

03 13 26 00 LMP How far are we away from that attitude?

CONFIDENTIAL

03 13 26 03 CMP Well, we're about on in roll, and pitch, we've got - oh, a couple of degrees to go.

03 13 26 09 LMP Is that all?

03 13 26 10 CMP Yes. We don't have but a few more degrees.

03 13 26 12 LMP All right.

03 13 26 26 LMP Houston, 14. I have you on the high gain.

03 13 26 30 CC ...

03 13 26 34 LMP Roger. Have you on the high gain, locked up.

03 13 26 38 CMP Okay. It says a 58.

03 13 45 31 SC ... again.

03 13 45 34 LMP Okay. Looks like we're there.

03 13 45 38 SC Looks like ...

03 13 45 41 LMP Yes.

03 13 45 51 CMP Okay.

03 13 45 53 LMP Okay. We've lost them altogether. Okay, there they go.

03 13 45 57 CDR What are we looking for today?

03 13 46 00 CMP Looking for number 12.

03 13 46 02 CDR Rigel. Okay. What have we got.

03 13 46 10 CMP Okay. You want a plus 288.30.

03 13 46 15 CDR Okay.

03 13 46 16 CMP Okay. You want a plus 27.100.

03 13 46 21 CDR 288.30, 27.100. ... star.

03 13 47 18 LMP Okay, Houston. There you are. Go ahead.

03 13 47 28 LMP Okay.

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03 13 47 34 CMP Okay, when you say hack it, I'll freeze them.

03 13 47 40 CDR HACK it.

03 13 47 43 CMP Okay. 27.8 by 27.1; it passes.

03 13 47 51 CDR Okay.

03 13 48 01 LMP Okay. Your being in pad burn attitude for the - is causing the comm problem. I'm sure it is. It's barely hanging on to enough signal strength to talk.

03 13 48 32 CDR Well, I still can't make that look like Rigel. There's a lot of light out there.

03 13 48 43 CMP I saw Orion awhile ago, but - -

03 13 48 45 CDR Yes, but so did I - but it sure doesn't look like it now.

03 13 48 48 CMP Yes, when I was looking for Procyon.

03 13 48 51 CDR Oh, all the light's coming from earthshine, I guess.

03 13 48 55 CMP Yes. But that's when - See, I had the 60-degree roll in; so the optics were pointed - better spot.

03 13 49 06 CDR ...

03 13 49 12 LMP Okay, LOS.

03 13 50 41 CDR Sure is strange that we can be able to see the rest of the constellations.

03 13 50 51 CDR Okay. Optics, ZERO.

03 13 51 09 CDR Not enough light out there, I guess. Okeydokey.

03 13 51 52 SC ...

03 13 51 54 LMP I can't see anything but stars.

03 13 51 56 CDR What?

03 13 51 57 LMP I can't see anything but stars, and we're no longer in earthshine anyhow.

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03 13 52 06 CMP ... I don't know if you want it up there or not.

03 13 52 08 CDR No, we're all through with it ...

03 13 52 11 CMP Okay. We're in P40, and let's check NOUN 40.

03 13 52 27 CMP Okay.

03 13 52 28 CDR It's plus 42 coming down on 18.

03 13 52 30 CMP And you agree to 206.4 as the total DELTA-V?

03 13 52 39 CDR Yes.

03 13 53 07 CMP ...

03 13 53 08 CDR Probably came from the LM. A lot of those little babies floating around; we brought them back, and they probably just floated out of our pockets.

03 13 53 22 CMP I'll put it over here, but it will probably float out of there, too.

03 13 53 53 CDR Have you hooked the ... on?

03 13 53 54 LMP 20.8.

03 13 53 57 CDR 20.8.

03 13 53 59 CMP Okay, what's your confidence on getting a hack on exact burn time now that you have looked at three of them, Ed?

03 13 54 07 LMP It's within 2/10ths. .

03 13 54 12 CDR Okay, great. Are you going to count down to zero ... 20.8? You have to shut it down on zero.

03 13 54 24 CMP We're going to wait until he calls zero, and then move the switches.

03 13 54 29 CDR Okay.

03 13 54 33 CMP I'll not try to have them off at the time he says zero.

03 13 54 37 CDR All right.

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03 13 54 39 LMP If you do that, the G&N and I are together, it will beat you - if it's -

03 13 54 44 CMP Sure. One ... - -

03 13 54 45 LMP If it's 2/10ths over, you'll have them off. Let's - let's say, 3/10ths on my time; you'll have them off within 3/10ths and we - we won't overburn more than 3/10ths.

03 13 55 01 CMP What's our ullage on this one?

03 13 55 03 CDR Four jets - -

03 13 55 04 LMP Four jets; 14 seconds.

03 13 55 07 CMP Hey, how's our reading - four - four jets; 14 seconds.

03 13 55 16 CDR How's our reading on what?

03 13 55 17 CMP The fuel and oxidizer. What are they?

03 13 55 21 LMP Right together; 34.9, 35.1; decreased by about 40 pound - 30 - 40 pound.

03 13 55 31 CDR Let me just jot that down - 34.9, oxidizer.

03 13 55 37 LMP 35.1, fuel.

03 13 55 50 CDR Okay. Did you get all your circuit breakers?

03 13 56 00 CMP I have done it. ... again.

03 13 56 01 CDR You're in - you're in RATE COMMAND. We've got B/D roll and you've got B/D roll.

03 13 56 35 CDR Okay. ATTITUDE DEAD BAND, MIN; RATE, LOW.

03 13 56 39 CMP MIN; LOW.

03 13 56 40 CDR TRANS CONTROL POWER, on.

03 13 56 41 CMP It's on.

03 13 56 42 CDR SCS TVC, two, RATE COMMAND.

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03 13 56 46 CMP Yes, they're RATE COMMAND.

03 13 56 48 CDR Okay. DELTA-V_{CG}, LM/CSM.

03 13 56 51 CMP LM/CSM.

03 13 56 52 CDR TVC GIMBAL DRIVE, PITCH and YAW, AUTO.

03 13 56 55 CMP They're AUTO.

03 13 56 56 CDR Okay. You're ready to - 4 minutes. You clear at 40 seconds.

03 13 58 26 CDR You got an AOS time with your ...? Do you have that?

03 13 58 32 LMP No.

03 13 58 34 CDR Okay. Let me give that to you.

03 13 58 35 LMP Okay.

03 13 58 40 CDR 87:15:06.

03 13 58 54 CDR If you don't have any voice at AOS, wait 30 seconds, check the high gain antenna, watch OMNI B, watch secondary transponder; after 3 mins, go to loss-of-comm cue card.

03 13 59 09 CMP Why don't you write that AOS time right there?

03 13 59 14 CDR/LMP ... right where?

03 13 59 15 CMP Right there. See, that's the things you'll have out.

03 13 59 21 CDR Okay. You wrote it down, didn't you?

03 13 59 24 LMP Yes. That's 87:15:06.

03 13 59 57 CDR What are you doing down there?

03 13 59 59 CMP Resting. This is really a comfortable position, mates. Pull on my legs like this. Really helps your back. - Doubled up.

03 14 00 15 LMP Man, I think we're going to sleep tonight.

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03 14 00 19 CMP We're still two REV's from the sleep period, aren't we?

03 14 00 21 LMP Yes.

03 14 00 22 CMP - - or a REV and a half.

03 14 00 23 LMP About that. Going to clean up, I think, after DOI, and we can start getting ready.

03 14 00 30 CMP No. I think we've got two REV's. We got - because of that bailout burn and stuff, we didn't get a chance to get Descartes, so - -

03 14 00 37 CDR - - get the LTC on Descartes.

03 14 00 39 CMP Yes, ... - I take a look at this landmark on this one, just for OJT, because there was nothing else we could do; and we've got to bring out the Hycon on the next pass around - -

03 14 00 50 LMP Get Descartes.

03 14 00 51 CMP Get Descartes. I'm kind of amazed at the detail you can see - -

03 14 00 54 LMP Boy; me, too.

03 14 00 55 CMP I was looking at all those pictures - -

03 14 00 57 LMP Man, it's going to be fun on this one. Whoo - It's going to be fun on this low pass.

03 14 01 04 CMP Yes. Wow -

03 14 01 07 LMP Hey, let's get out - let's grab our LM landmark chart for this low pass.

03 14 01 16 CMP Okay. We got plenty of time - after the burn?

03 14 01 23 CDR Yes.

03 14 01 24 LMP Yes, that's right. We've got plenty of time after the burn. No rush.

03 14 01 27 CMP I don't think you'll be in a good attitude to see it on this one - ...

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03 14 01 31 CDR Must be so - I've been tracking it and it's pretty well angled, as I recall.

03 14 01 37 CMP But after the - on the Hycon pass, the hatch should be toward Descartes, so we should be able to see something out of these other windows.

03 14 01 52 LMP Well, when you were - tracking with a 16-millimeter, I had a beautiful view out here. Course you - were you rolled?

03 14 02 03 CMP No.

03 14 02 04 LMP You were - -

03 14 02 05 CMP Well, we're going to be just about the same attitude. Let me see - this is 292. We're about 8 minutes to the burn - something like that. ... You want to do ...

03 14 02 36 CDR Okay. You going to start on bank A, and you're going DIRECT THRUST, ON, if you have to.

03 14 02 40 CMP No.

03 14 02 42 CDR You're not going to on this one?

03 14 02 44 CMP No.

03 14 02 45 CDR Okay.

03 14 02 46 CMP I'm not going to start for nothing. ...

03 14 02 48 CDR Okay.

03 14 02 49 CMP Are you trying to quiz me, or are you - -

03 14 02 54 CDR (Laughter) Yes.

03 14 02 55 CMP Well, that's good. Let's make sure we all know what we - -

03 14 02 57 CDR Be sure you know what you're going to do.

03 14 02 59 CMP Yes. I will bring on bank B, as soon as I can.

03 14 03 06 CDR Okay. ...

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Day 4

03 14 03 09 CMP Let me try that, Edgar. Edgar Allan Poe. Man, I used to love to read his short stories. He can - he can write about a person being dead better than anybody I've ever seen.

03 14 03 31 CDR Yes. I guess he was a real - he lead kind of a tough life, didn't he?

03 14 03 41 CMP Yes. Yes, he - He got a lot of his inspiration coming in and out of the DTs, I understand. How did you have it? Did you have it hooked like that?

03 14 03 53 CDR No, I had a strap on it before.

03 14 03 56 CMP Oh.

03 14 04 33 CDR Okay, Ed. Bring on the MAIN BUS TIEs.

03 14 04 41 LMP Okay. There's A - -

03 14 04 42 CMP - - only one-half - -

03 14 04 45 LMP There's B.

03 14 04 48 CDR Okay. Good. TVC SERVO POWER, number 1, AC 1/
MAIN A.

03 14 04 55 LMP Hey, Stu, when you click these things off, give me time to switch to the other - -

03 14 05 00 CMP I will. I'll do that.

03 14 05 01 LMP - - other ...

03 14 05 02 CMP Okay. TVC SERVO POWER, 1, AC 1/MAIN A, verified.

03 14 05 07 CDR 2, AC 2/MAIN B.

03 14 05 08 CMP That's verified.

03 14 05 09 CDR RHC POWER, NORMAL, two, AC.

03 14 05 12 CMP Okay.

03 14 05 13 CDR DIRECT, two, OFF.

03 14 05 14 CMP OFF.

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03 14 05 15 CDR BMAGs, one-half.

03 14 05 21 CMP Okay. One-half.

03 14 05 21 CDR SPACECRAFT CONTROL, SCS, and hand controller, armed.

03 14 05 25 CMP SCS; hand controller's armed.

03 14 05 28 CDR Okay. ...

03 14 05 34 CMP Anything that's looking not right on this one is a shutdown - we're not going to freak around.

03 14 05 55 CMP Okay. You ready for GIMBAL MOTOR?

03 14 05 56 CDR Okay. Bringing on number 1.

03 14 05 57 LMP Any time.

03 14 05 58 CMP PITCH 1.

03 14 05 59 LMP You've got it.

03 14 06 00 CMP YAW 1.

03 14 06 01 LMP You have it.

03 14 06 02 CMP Okay. We want a plus-Y trim - -

03 14 06 04 CDR Plus-Y trim and set plus 145.

03 14 06 05 CMP There's 1 - 45.

03 14 06 09 CDR And minus 0.7.

03 14 06 13 CMP Minus 0.7.

03 14 06 15 CDR Okay. MTVC.

03 14 06 17 CMP Okay. I have it.

03 14 06 19 CDR Okay. Tick it off. ... the handle. Ready for number 2?

03 14 06 21 CMP Okay. No MTVC. You ready for number 2?

03 14 06 25 LMP Bring them on.

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03 14 06 26 CMP PITCH 2.

03 14 06 27 LMP You have it.

03 14 06 28 CMP Got it. YAW 2.

03 14 06 30 LMP You have that one.

03 14 06 31 CDR Okay. Verify - -

03 14 06 32 CMP ... set.

03 14 06 33 CDR - - MTVC.

03 14 06 34 CMP Okay.

03 14 06 35 CDR Set trim.

03 14 06 36 CMP Okay. The trim is set.

03 14 06 37 CDR Okay. Back to neutral.

03 14 06 39 CMP Back to neutral.

03 14 06 40 CDR No MTVC; GPI, zero.

03 14 06 41 CMP Zero; no MTVC.

03 14 06 43 CDR Okay. RHC POWER, NORMAL, two, AC/DC.

03 14 06 47 CMP Okay.

03 14 06 48 CDR DIRECT, two, MAIN A/MAIN B.

03 14 06 49 CMP MAIN A/MAIN B.

03 14 06 51 CDR And you're ready for your final trim.

03 14 06 53 CMP BMAGs, RATE 2.

03 14 06 54 CDR RATE 2.

03 14 06 55 CMP Got that one.

03 14 06 56 CDR Here we go. Okay. Look happy.

03 14 07 06 CMP ... stop from shaking. Okay.

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03 14 07 12 CDR Okay. ATT 1/RATE 2.

03 14 07 14 CMP ATT 1/RATE 2.

03 14 07 16 CDR Ready for the gimbal test option.

03 14 07 18 CMP I'm ready. Up 2. Down 2.

03 14 07 23 CDR 0.1.

03 14 07 24 CMP Zeros. Up 2. Down 2. Zero.

03 14 07 32 CDR Plus 1.45; minus 0.71.

03 14 07 36 CMP Okay. 1.45; minus 0.7.

03 14 07 40 CDR Okay. Set the FDAI SCALE 5/5.

03 14 07 45 CMP 5/5.

03 04 07 48 CDR Okay, RATE, HIGH?

03 14 07 49 CMP RATE is HIGH.

03 14 07 51 CDR Check the DET at 67. 3, 2, 1 -

03 04 07 54 CDR MARK. Okay. Verify two SPS HELIUM VALVES in AUTO. Barber pole.

03 14 08 01 LMP Verify.

03 14 08 03 CDR Check N_2 A and B.

03 14 08 06 LMP You've got that.

03 14 08 08 CDR Okay.

03 14 08 09 LMP Helium pressure is a little lower than I expected to see it at this point. Let's say that's 1500 pounds.

03 14 08 15 LMP That's - that's about right. It's about 1000 during rendezvous, looking at the PDI.

03 14 08 22 CDR I guess we'll bring on the tape recorder soon as we have the burn, huh?

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03 14 08 27 LMP Yes, I'll get it on. They'll want it on late; I'll get it on late.

03 14 08 30 CDR Okay.

03 14 08 37 CMP Actually, I suspect we're probably in a blowdown mode on that helium right now.

03 14 08 47 LMP No, shouldn't be, not 1500 pounds.

03 14 08 50 CMP Yes, but I mean if we'd lost it all - -

03 14 08 52 LMP Oh, we could probably - yes, probably - -

03 14 08 54 CMP ...

03 14 08 55 CDR Okay. Bring her on bank A.

03 14 08 58 CMP That son of a bitch is a second off, but I'm not using this time. Okay. Band A is off. Let's sweep the cockpit. We missed that. ATT 1/RATE COMMAND - -

03 14 09 09 CDR Go to HIGH BIT RATE and RECORD; FORWARD; COMMAND RESET.

03 14 09 13 LMP Okay.

03 14 09 14 CMP - - CMC, AUTO; ATT 1/RATE 2; DELTA-V THRUST.

03 14 09 17 LMP RECCRD; FORWARD.

03 14 09 20 CDR Okay, good.

03 14 09 21 CMP You've got HIGH BIT RATE.

03 14 09 23 LMP You'll have HIGH BIT RATE in just a minute. I think those bastards told me not to turn it on early.

03 14 09 32 CMP We want them to get it, Edgar.

03 14 09 36 LMF Well, they're going to get it.

03 14 09 44 CDR Okay, four jets at 14 seconds.

03 14 09 47 CMP I'll hit her 14 seconds of ullage. On what - -

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03 14 10 14 LMP ... is good.

03 14 10 16 CMP Okay, THC is armed.

03 14 10 18 CDR Okay, we're looking pretty normal at 30.

03 14 10 20 CMP Okay, we're setting up trim. We're setting at attitude.

03 14 10 23 CDR DSKY's on time. Okay, EMS, NORMAL.

03 14 10 27 CMP EMS MODE is NORMAL.

03 14 10 29 CDR Okay, looking good.

03 14 10 31 LMP Give me plenty of lights over there. I don't want to miss it.

03 14 10 36 CMP All righty.

03 14 10 37 CDR Okay, looks good. 18, 17, 16, 15, ullage, 13, 12, 11 - we are counting - 10, 9 - -

03 14 10 47 CMP Steady as a rock.

03 14 10 48 CDR - - 8, 7, 6, 5, PRO, 3, 2, 1, 0.

03 14 10 56 CMP Bank A.

03 14 10 57 LMP Take out A and B.

03 14 10 58 CMP Bank B.

03 14 11 10 CDR 5, 4, 3, 2, 1 - -

03 14 11 15 CDR SHUTDOWN. Okay.

03 14 11 17 CMP G&N shutdown - -

03 14 11 18 CDR ... shutdown. DELTA-V THRUST, two, OFF. Bring off the GIMBALS MOTORS.

03 14 11 23 CMP Okay. You ready for number 2.

03 14 11 24 LMP 2's coming OFF.

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03 14 11 25 CMP That's minus 6.2 before we pick up with the count.
Okay, YAW 2 is OFF.

03 14 11 30 LMP Got it.

03 14 11 31 CMP PITCH 2 is OFF.

03 14 11 32 LMP You've got it.

03 14 11 33 CMP YAW - YAW 1 - ready?

03 14 11 34 LMP Yes.

03 14 11 35 CMP YAW 1, OFF.

03 14 11 36 LMP Got it.

03 14 11 37 CMP PITCH 1, OFF.

03 14 11 38 LMP You got it.

03 14 11 39 CMP TVC SERVO POWER.

03 13 11 40 LMP Okay.

03 14 11 41 CMP Okay.

03 14 11 42 LMP Let's go to LOW BIT RATE.

03 14 11 56 CMP What's our rule? It's less than 1, I believe.

03 14 12 03 CDR That's right. ... huh?

03 14 12 05 CMP Yes. This is a ... burn, anyway. ... your normal
burn ... This is a ... burn.

03 14 12 12 LMP Okay. Moving 1 foot per second.

03 14 12 14 CDR We're all right.

03 14 12 15 CMP Okay. That's PRO and a VERB 82.

03 14 12 16 CDR Okay.

03 14 12 17 CMP Put a VERB 82 in there, and won't have to go
through the time line.

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03 14 12 19 CDR Okay. Okay. Did you finish up on this? TVC
SERVO POWER, 1 and 2, OFF; BUS TIES, OFF?

03 14 12 27 LMP BUS TIES are OFF.

03 14 12 29 CDR Okay.

03 14 12 30 CMP Residuals.

03 14 12 31 CDR And, okay.

03 14 12 32 CMP Okay. We're looking for what?

03 14 12 34 LMP You're looking for -

03 14 12 38 CMP 9.1, aren't we?

03 14 12 39 LMP 9.1; 58.8.

03 14 12 43 CMP Okay. Record DELTA-V counter and residuals; EMS
FUNCTION, OFF; and STANDBY.

03 14 12 48 CDR ...

03 14 12 52 LMP I hacked your burn time as 20.6.

03 14 12 59 CDR 10.4 ...

03 14 13 00 CMP THC POWER is OFF; RHC POWER, DIRECT, two, OFF.

03 14 13 11 CDR Okay.

03 14 13 12 CMP Circuit breaker DIRECT ULLAGE are open. We have
PITCH 1 and YAW 1.

03 14 13 19 LMP What was DELTA-V_C, by the way? Do you know?

03 14 13 22 CDR Minus 6.2.

03 14 13 23 CMP What did they say we should have? Minus - -

03 14 13 26 LMP 6.7.

03 14 13 28 CMP Okay. I guess you shut down a little early.

03 14 13 31 CDR We shut down early.

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03 14 13 32 LMP Did it beat you to it?

03 14 13 33 CMP Oh, yes.

03 14 13 34 CDR Oh, yes. Yes. Okay. VERB 66 ENTER. Okay. You down there?

03 14 13 43 CMP Yes. BMAG MODE, three, RATE 2. Are you PCM BIT RATE, LOW?

03 14 13 48 LMP I'm PCM BIT RATE, LOW.

03 14 13 49 CMP Okay.

03 14 13 51 CDR Okay. We did not have an update on bailout burn attitude. Is that right?

03 14 13 55 LMP That's right.

03 14 13 56 CDR Okay. We're loading: Plus 32500 ENTER, plus 06300 ENTER, plus 000325 - 0630 - -

03 14 14 15 CMP Did you ever ENTER - Yes. You ... - -

03 14 14 16 CDR - - ENTER. That's all. Are you ready to maneuver?

03 14 14 20 CMP CMC, AUTO; RATE 2; and RATE COMMAND. Okay.

03 14 14 24 CDR Here we go. VERB 66 is in. That's in. ... burn time...?

03 14 14 31 CMP Did you - you did do a VERB 66, Al? Okay.

03 14 14 34 LMF I hold the burn time at 20.6.

03 14 14 37 CDR 20.6, huh?

03 14 14 39 LMF Yes.

03 14 14 49 CDR ...?

03 14 14 50 LMF No, 20.8.

03 14 14 52 CDR Oh, yes. You just flat shut down a little early.

03 14 15 00 CMP Yes, it sure did. Hell, he did his impulse burn better than that. ... seconds.

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03 14 15 12 CDR Well, what did you say that was? It was 2/10ths of a mile per foot per second?

03 14 15 20 CMP About 3/4ths. You mean to drop your perigee?

03 14 15 23 CDR Yes. Okay, we're ...

03 14 15 34 CMP Six-tenths of 75 would be approximately - -

03 14 15 39 LMP ...

03 14 15 40 CMP - - 0.45, right at a half a mile.

03 14 15 41 LMP A half a mile.

03 14 15 45 CDR What were they ..., Stu?

03 14 15 47 CMP They were looking for - -

03 14 15 48 LMP 10.1.

03 14 15 50 CMP CMC said it was going to go into a 9.9, and it went into a - -

03 14 15 54 LMP 10.1.

03 14 15 55 CMP 10.4.

03 14 15 57 LMP Yes. 10.4.

03 14 16 00 CDR That's good. You can get down in a hurry.

03 14 16 08 CMP Can you take it the rest of the way?

03 14 16 09 CDR Yes.

03 14 16 10 CMP All right.

03 14 16 16 CDR You just overburned, anyway, by God.

03 14 16 17 LMP Yes. We sure did.

03 14 16 19 CMP Now, you said zero, and I gave it a "huh" and started off - -

03 14 16 22 CDR Yes.

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03 14 16 23 CMP - - on the switches.

03 14 16 24 CDR You said ...

03 14 16 25 LMP ... switches. That's what I was watching.

03 14 16 26 CMP Yes. It was at the end of the checklist.

03 14 16 29 LMP I thought you got to it - -

03 14 16 30 CMP No.

03 14 16 31 LMP - - Stu.

03 14 16 34 CDR Okay, give me fuel, please.

03 14 16 36 LMP Fuel is 31.7; oxidizer, 31.4; and I'm on minus one - minus 90, decrease. Yes.

03 14 16 53 CMP Hey, while - while we got a couple of minutes, let me go back to that, if you're through with ... I want to make a note on that LOI burn about our PUGS operation because she didn't go as advertised at all.

03 14 17 13 LMP Well, the PUGS went pretty much as advertised, except for the crossover, Stu.

03 14 17 16 CMP That's what I meant. The PUGS indication is what I - -

03 14 17 26 LMP The crossover was just as smooth as glass.

03 14 17 39 LMP As a matter of fact, if I - hadn't realized it was time for crossover, I'd have still been controlling that thing about a minus 150 at the end of the burn, because there was no indication of - on the gages at crossover.

03 14 17 56 CDF You didn't have a high P_C that time, did you?

03 14 18 03 CMP No, it - it was about 105. Sounds like to me it was just - maybe just a tad over.

03 14 18 06 CDR Okay. Everything agreed then. P_C and burn time and EMS and G&N.

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03 14 18 14 CMP No. There's a "no vote" thing in there ...

03 14 18 17 LMP Right, no question as far as any of the onboard stuff is concerned. And that's the way it should be. Hey, look at that.

03 14 18 27 CDR Okay.

03 14 18 28 LMP We're back across the terminator.

03 14 18 30 CMP We're on our way down, this time.

03 14 18 32 LMP Yes.

03 14 18 38 CDR You want to ...?

03 14 18 40 CMP Yes.

03 14 18 41 CDR Okay.

03 14 18 50 LMP Are we maneuvering? We completed everything?

03 14 18 53 CMP No, we haven't half completed. We've got a hell of a long way to go.

03 14 18 58 CDR ... the bailout attitude.

03 14 19 00 LMP Yes.

03 14 19 10 CDR We don't have your time. You screwed that up.

03 14 19 13 LMP Pardon? Oh, that's all right. I'm - I'm - Man, we are noticeably moving across the landscape, now.

03 14 19 34 CDR Oh, yes. Now we ...

03 14 19 39 LMP Hey, Al; grab our damned IM cards, will you?

03 14 19 44 CDR I don't think you're going to be able to see the landing site. You'll be able to see stuff around it.

03 14 19 48 LMP Well, I'd like to look at it, anyway.

03 14 19 50 CMP Terminator's not - -

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03 14 19 52 LMP It's not quite there yet, I know, but I can see the approach.

03 14 20 01 CDR Which one do you want, Ed?

03 14 20 03 LMP Well, we only have one. That's in the LM bag, Al. What was that 180-degree time?

03 14 20 16 CDR We lost it.

03 14 20 18 CMP 86:53:05.

03 14 20 25 LMP 86:53:05. Here we go.

03 14 20 36 CMP Hey, Al, when you're - there - there's a book in there, my CSM Landmark Book; I put it in there for the burn, because I think you - I think it's over toward the right, maybe toward the back. Way back in there; it'll be about an inch and a half thick. ... There we go.

03 14 21 01 LMP Put that in there.

03 14 21 04 CMP Thank you.

03 14 21 29 CMP Chaplygin, it's a bright crater.

03 14 21 40 CDR That's a wild view out there, babe.

03 14 21 43 CMP See that bright crater right on the edge of Chaplygin there, too? Through my window maybe. See it coming right there? That thing really shows up. See that little bitty mother? It is really a - it is really a bright thing - in the - in the photo. This is a 2000 - this is really a 2001 epic - it's unreal.

03 14 22 07 CDR It's a hell of a view. It's coming zipping around, you know how you do - just like ...

03 14 22 20 LMP Okay, Stu, my chart starts with La Perouse - La Perouse clusters.

03 14 22 38 LMP Should be 21 minutes after - 20 sec - 20 minutes.

03 14 23 02 SC ...

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03 14 23 39 LMP We should - in a few more minutes.

03 14 24 05 CMP Man! What a view.

03 14 24 07 CDR What?

03 14 24 08 LMP We're losing our view. We should be coming up on the Crater Mendeleev.

03 14 24 14 CDR ...

03 14 24 16 LMP Pardon? Do you have Mendeleev out your side, Stu?

03 14 24 22 CMP No, it's off to your - to your right.

03 14 24 24 LMP That's right, you couldn't - We're too low for you to be able to see across. You have - you should be about over Chaplygin.

03 14 24 30 CMP We're past Chaplygin - we're going right over the Lovelett.

03 14 24 33 LMP Are you?

03 14 24 38 CDR Look at that.

03 14 24 39 LMP Yes. Yes.

03 14 24 42 CDR Isn't that wild?

03 14 24 44 LMP Dellinger and Pannekoek.

03 14 24 55 CDR Great Caesar's ghost!

03 14 25 06 LMP How come we're rolled so far left ... now? ... antenna?

03 14 25 09 CDR Yes.

03 14 25 21 CDR You get more of a feeling of the elevation from the ... here.

03 14 25 24 LMP Yes. Could I crowd you over just a hair, so I can look out your window?

03 14 25 28 CDR ...

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03 14 25 29 LMP Oh. Yes. We're losing all of it now, aren't we?

03 14 25 56 CMP You know, that - that sharp crater back at Chaplygin was rather phenomenal. Next time we come across there, if you get a chance to see it - it looks like it's been draped around the rim.

03 14 26 06 CDR Draped?

03 14 26 07 CMP With a - with a darker material. Kind of - It's real fascinating.

03 14 26 22 LMP Well, it is pitch black out this window. I can see stars out this window.

03 14 26 29 CDR That's good.

03 14 26 30 LMP I'll be damned.

03 14 26 42 LMP I can see your jets firing, too.

03 14 26 44 CDR It really must be nice ... Yes. We're there.

03 14 26 52 LMP We were there, huh?

03 14 26 56 CDR Roger. We are there. Okay, Imbrium.

03 14 27 00 CMP Oh, that's right.

03 14 27 03 CDR ... happy over there?

03 14 27 05 CMP Not quite at 65 yet. Wonder why it's - -

03 14 27 09 CDR Three.

03 14 27 10 CMP Oh, 63; okay, yes; it's there. It - it'll go ahead and die down - once it's ... 58 feet.

03 14 27 50 CDR The scheduled acquisition is at 16:08 ... maybe get a couple of things going.

03 14 27 57 LMP Yes.

03 14 28 01 CDR ...

03 14 28 02 LMP We're higher. We ought to get there - -

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03 14 28 03 CDR We're a little higher.

03 14 28 04 LMP - - a little early.

03 14 28 05 CDR Yes, we're higher, even though we're slower; we'll probably be a little early.

03 14 28 14 LMP What are you coming up on, Stu? Okay. You - you're coming up on 11:20.

03 14 28 28 CMP We ought to be able to see ... out there. We're just about north of it. You know, it's not as dark - the mare's not as dark as I expected it to be.

03 14 28 38 LMP Okay. It's sure darker than I expected it to be. Noticeably darker. I really didn't expect it to be that - at this altitude or this close - expect to be able to see that much difference.

03 14 29 26 LMP I'm going to see that I'm all set up for this acquisition. Minus 39; plus 325. Okay. I'm HIGH GAIN, MANUAL, WIDE. And 6 minutes away from it.

03 14 29 53 CDR Oh, it looks good through the sextant.

03 14 29 56 CMP What?

03 14 29 58 CDR Sure locks good through the sextant.

03 14 30 03 CMP Well, I think it's got a reddish tint to it out the window. Sort of like, you know, the south-west desert. You know, red hasn't been mentioned before. Do you see Tsiolkovsky over there?

03 14 30 23 LMP Oh, sure; that's Tsiolkovsky. Okay. I've got it. Yes. That mother is black out there, isn't it? And flat. And there are really a lot more color differences than I expected.

03 14 30 46 CDR Okay. What's that one that we talked about the other time that had that bench - the bench that looked like a quarry.

03 14 30 54 CMP Oh, the bright one.

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03 14 30 55 CDR Yes.

03 14 30 56 CMP Yes.

03 14 30 57 CDR It's got a reddish tint to it. Got a lot of boulders in it, too. That's a really sharp drop in the - in the walls of that baby - really sharp break.

03 14 31 21 CMP Okay. Langemak is coming up on this side - -

03 14 31 23 LMP Yes.

03 14 31 24 CMP - - almost dead underneath me.

03 14 31 31 LMF Langemak - got it.

03 14 32 01 CDR ...

03 14 32 33 CDR Man, there's a big crack in the ground. ...

03 14 33 00 CDR You want to take a look at this thing, Stu?

03 14 33 02 CMP Yes. Let me get a feel for what it's going to look like at lower altitude. What is that - NOUN 43 off of that card there. What is - what are the units on that thing. ... Okay. And it says we're at 43.6.

03 14 33 26 LMP Now we're at 43.6?

03 14 33 29 CMP Yes.

03 14 33 33 CMP VERB 32 ENTER, 87:22, and in 9 minutes we'll be down to - 30.4.

03 14 33 49 CDR Take a look at what I'm tracking.

03 14 34 06 LMP Okay; 1 minute to AOS.

03 14 34 07 CDR I guess, why?

03 14 34 09 CMP Awful blurry.

03 14 34 17 CDR Yes.

03 14 34 18 CMP Almost too blurry to do any good in here.

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03 14 34 21 CDR ... real big fissure in the ground. See it now?

03 14 34 30 CMP Wait a minute. We just passed something. Man, that looks wild, doesn't it? No. That was that crater that I saw. I didn't see the fissure.

03 14 34 44 CDR It looks like a fissure.

03 14 34 51 CMP Oh, you mean coming down the side of that crater?

03 14 34 53 CDR Yes.

03 14 34 54 CMP Yes.

03 14 34 59 CDR ...

03 14 35 01 LMP Eight seconds.

03 14 35 05 CMP Hey, you know I - It looks like it's more that - that draping though.

03 14 35 10 LMP There it is.

03 14 35 14 CDR Right on time.

03 14 35 17 CDR Houston, Apollo 14.

03 14 35 21 CC ...

03 14 35 25 CDR Okay. The burn went essentially normally. Burn time was 20.6 seconds with the following residuals on the G&N shutdown: plus 0.6, plus 0.2, 0; DELTA-V_C, minus 6.2. You with me?

03 14 35 53 CC ...

03 14 36 08 CDR That is correct. Fuel, 31.7; oxidizer, 31.4 - -

TIME SKIP

03 15 38 47 SC (Music - "Truck Driving Man")

03 15 39 00 LMP What is that?

03 15 39 04 CDR Go ahead, Houston.

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03 15 39 23 CDR Okay - -

03 15 39 24 CMP Okay, Gordon. Oh, ye of little faith. But don't sweat all - all the reminders.

03 15 39 45 LMP He could interpret that to mean don't give you those little reminders.

03 15 40 03 CDR Now, there's a good song. What's the name of that son of a bitch?

03 15 40 07 CMP "Truck Driving Man."

03 15 40 10 LMP Can I put this under here? It's the only one I've got big enough to hold it.

03 15 40 12 CDR Yes. Go ahead.

03 15 40 14 LMP Okay.

03 15 40 30 LMP I knew lunch was a little short today.

03 15 40 34 CDR Well, they knew we were going to be busy.

03 15 40 37 LMP Yes. Yes, we didn't (cough) - -

03 15 40 38 CDR We don't get any wetpacks tonight, huh?

03 15 40 49 LMP I'm going to have to look again. I thought we did.

03 15 40 57 CDR I'll check it.

03 15 41 08 CDR Yes, I might use a blue bag tonight.

03 15 41 13 LMP Well, I'm sure going to try. Hell, you - -

03 15 41 20 CDR Day - day - day 4, meal C?

03 15 41 24 LMP Yes, that's those other ones we have - -

03 15 41 26 CDR It says a greef-and-bav - beef-and-gravy wetpack. Stu's supposed to have a beef-and-gravy wetpack.

03 15 41 35 LMP And I'm supposed to have a beef-and-gravy wetpack.

03 15 41 38 CDR Stu, you're supposed to eat wetpacks tonight.

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03 15 41 49 CMP Well, they gave me too much hot stuff.

03 15 42 00 CDR We start over again after tonight.

03 15 42 04 LMP Yes?

03 15 42 09 CDR How many days of food do we have in there before we have to start making our own?

03 15 42 47 CDR Would you pull our wetpacks out of there, babe?

03 15 42 55 CDR Stu?

03 15 42 56 CMP Huh?

03 15 42 57 CDR We're supposed to have three wetpacks out of there.

03 15 42 59 CMP Out of here?

03 15 43 00 CDR Yes, beef and gravy.

03 15 43 21 CMP (Singing)

03 15 43 36 CMP Yes, that must have been the beef and gravy that I ate for lunch. I guess I'll eat that damn spaghetti.

03 15 43 42 CDR I'll eat the spaghetti.

03 15 43 43 CMP No, no; I - I'm not going to bitch about the food. I just won't eat it (laughter). I won't bitch.

03 15 44 03 CMP Somebody watching my flight plan while we're - -

03 15 44 05 LMP Yes.

03 15 44 08 CDR Watch your what?

03 15 44 10 CMP What time do we do something?

03 15 44 12 LMP We start maneuvering, 6 minutes.

03 15 44 13 CDR ...

03 15 44 22 CMP Oh, I'm sorry.

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03 15 44 27 CDR Babies stay pretty cool in that stuff - place in there.

03 15 45 25 CDR We're going to use the hot water only?

03 15 45 27 CMP What?

03 15 45 28 CDR Use the separator on the cold water - on the cold water only, right?

03 15 45 30 CMP Yes, I think that's the plan.

03 15 45 33 CDR Okay. Now let's see, you can put 3 ounces of hot in that baby. And I'll go up and unsnap the gun. Okay, that ...

03 15 45 52 CMP Oh, okay.

03 15 45 55 CDR ...

03 15 46 12 LMP May I have the scissors a minute, or are you using them?

03 15 46 52 LMP What are you doing, hot or cold now, Stu?

03 15 47 01 CDR He's doing the hot down there, Ed.

03 15 47 04 LMP Okay. See if I get anything hot. Yes, there's a hot.

03 15 47 50 SC (Music)

03 15 47 53 CDR Those guys actually sell any records of that stuff?

03 15 48 08 CDR Those guys actually sell many records of that stuff?

03 15 48 13 CMP He's got a TV show.

03 15 48 15 CDR Really?

03 15 48 16 CMP Yes, it's been on several years. It's the hillbilly Laugh In? I don't know if you ever happen to pass by - -

03 15 48 24 CDF Yes, we saw that the other night.

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03 15 48 28 LMP What? Hee Haw?

03 15 48 29 CMP You know, it's getting kind of hot in here. Is it to y'all?

03 15 48 36 LMP ... down to 70.

03 15 48 37 CDR Flow's down, I don't know.

03 15 49 51 LMP Probably ought to start a VERB 49 maneuver.

03 15 49 55 CDR Okay. Now we can do.

03 15 50 12 CDR Okay, it's going to be blunt end forward.

03 15 50 16 CMP What?

03 15 50 17 CDR Going to be blunt end forward. ... changing around.

03 15 50 23 CMP Did they change that?

03 15 50 24 LMP Yes.

03 15 50 28 CDR ...

03 15 50 33 CMP I wonder why in the hell they waited until now to do that.

03 15 50 35 CDR Seems kind of strange ...

03 15 50 38 CMP I mean that son of a bitch has been out for a long time.

03 15 50 41 LMP Yes.

03 15 50 45 CDR Okay, we're in RATE COMMAND; CMC, AUTO. All the jets are on; B/D ROLL. B/D ROLL.

03 15 51 10 CDR We're moving.

03 15 51 15 SC (Music - "I've got a Tiger by the Tail," Buck Owens)

03 15 51 52 CDR (Laughter)

03 15 54 29 CMP I can't understand it.

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03 15 54 42 CMP Are we doing what we're supposed to be doing, leader?

03 15 54 47 CDR ... maneuver to 352.

03 15 54 49 CMP Okay.

03 15 54 50 CDR 146, 355.

03 15 54 57 CMP When do we get out the Hycon -

03 15 55 01 LMP ... camera in 10 minutes.

03 15 55 25 SC (Music)

03 15 55 54 CMP Another tissue box empty. I have to stow that -

03 15 56 27 LMP Hey, Stu, will you grab that bag of yellow pills and toss them this way, please?

03 15 57 09 LMP Get away from me, you noisy son of a bitch.

03 15 57 12 CMP Huh?

03 15 57 13 LMP I told that noisy son of a bitch to float around somewhere else.

03 15 57 23 CMP You're not clear enough. I don't know, they got bad acoustics.

03 15 57 31 LMP One thing about that, you can just let it float, and you can always find it.

03 15 58 33 CMP Why don't you turn it off, there, and save the battery? I need the switch system. Throw the tape over. Or did you do that?

03 15 58 44 CDR I'll get it in a minute.

03 15 58 54 CDR Flip it over and hear the other side?

03 15 58 57 CMP Yes, why don't you, if you don't mind. God, I didn't want to - didn't want to impose on you there.

03 15 59 12 CDR Yes, we'll do it. Seems to be something I'm missing in this country music.

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03 15 59 29 CMP It's - Don't put the cap on it, Ed.

03 15 59 31 LMP Huh?

03 15 59 32 CMP Don't put the cap on it; I'll take it.

03 15 59 35 LMP Are you going to - you going to put something in the bag or are you going to - -

03 15 59 38 CMP No, I was going - No, go ahead, if you're using it. I was just going to give Myrtle a drink.

03 15 59 44 LMP I'm going to give me one, too. Oh, hell.

03 16 00 09 CMP Why don't you let me use it while you're doing that?

03 16 00 20 CDR Recorder end up down there with you?

03 16 01 01 CMP Wish I'd had the camera out. I'd like taking a couple of pictures of those bright craters from that low orbit.

03 16 01 07 LMP Yes.

03 16 01 08 CMP With that dark -

03 16 01 13 SC (Music)

03 16 01 26 CMP Who in the hell is that?

03 16 01 54 LMP Oh, God!

03 16 02 14 SC (Music)

03 16 02 30 CMP Now that's country music. That's not uptown.

03 16 02 57 CDR You're right.

03 16 03 09 CDR Nothing uptown about that.

03 16 03 45 CDR Okay. We're here.

03 16 04 33 CDR Man, I couldn't have said I like that. Terrible!

03 16 05 00 LMP Well, Stu? We better get with it, baby.

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03 16 05 07 CDR Better start configuring the camera. Finish dinner later.

03 16 05 21 CMP Yes. Why don't you let me finish this?

03 16 05 24 LMP ... one is terrible ...

03 16 05 28 CMP Well, I went to all the trouble; I'm going to eat something.

03 16 05 38 CMP ... food packs are stuck ...

03 16 06 05 CMP That's a horrible record. Acoustics on it aren't any good.

03 16 06 10 LMP In love.

03 16 06 15 CDR Funny, this flight plan calls for - later on, it calls for blunt end forward.

03 16 06 20 CMP What?

03 16 06 21 CDR It calls for front end forward. ... Down here, later on, where it describes what to do, it calls for front end forward.

03 16 06 52 CDR Ugh.

03 16 06 56 LMP Burn 180 degrees. ...

03 16 07 04 LMP Stu?

03 16 07 05 CMP What?

03 16 07 06 LMP ... 180 degrees ... 1 minute - -

03 16 07 11 CDR I'll give you a mark.

03 16 07 13 CMP Okay.

03 16 07 26 CDR Need some more of those.

03 16 07 28 LMP Pardon?

03 16 07 40 CDR Okay, everybody, it's zero minutes. General quarters stations for the LTC. ...

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03 16 07 49 LMP Five seconds --

03 16 07 54 LMP MARK.

03 16 08 42 CDR Okay.

03 16 08 48 CMP Got to put that up in the tunnel?

03 16 08 53 LMP Everything else can remain, can't it?

03 16 08 57 CMP Yes.

03 16 10 36 CDR We need a grounding wire for this thing ... any way. We used to have ...

03 16 10 40 CMP Altitude chamber only.

03 16 10 45 CDR This is big end forward, right?

03 16 10 46 LMP Big end forward.

03 16 10 48 CDR Okay. What ... in?

03 16 11 19 CDR Okay. ...

03 16 11 24 LMP SCIENTIFIC POWER switch, OFF.

03 16 11 29 CDR OFF.

03 16 11 31 LMP AC UTILITY POWER, 201's OFF.

03 16 11 33 CDR It's OFF.

03 16 11 35 LMP Connect the vacuum line.

03 16 12 09 CMP Okay. POWER is OFF. MODE to STANDBY.

03 16 12 16 CDR Move your foot, Ed?

03 16 12 34 CMP I don't really like this strap that goes on around the magazine, because I don't want to have to piddle with it. I'm taking it off. It's a no-goodnik. That's ground use only. I didn't even think they were supposed to be on - on the flight - camera.

03 16 13 05 LMP With all the fuss ... wouldn't dare not have them on the flight camera. Okay, where does this go?

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03 16 13 34 LMP Okay, we got all the lines hooked?

03 16 13 41 CMP Okay, read them off.

03 16 13 43 LMP Okay, we've got the vacuum line, the overboard drain - -

03 16 13 48 CMP We don't have a vacuum line, yet. Okay, now we have a vacuum line.

03 16 13 52 LMP All right.

03 16 13 53 CDR The drain is open.

03 16 13 54 LMP Connect the power cable.

03 16 13 56 CMP Power cable is connected.

03 16 13 57 CDR ... battery is connected.

03 16 13 58 LMP Connect the control box.

03 16 13 59 CMP Control box is connected.

03 16 14 01 LMP Verify the POWER, OFF, and MODE, STANDBY.

03 16 14 02 CMP OFF; MODE, STANDBY.

03 16 14 03 LMP All right. Remove the pip pins and the lens cover.

03 16 14 26 CMP Okay.

03 16 14 30 LMP All right. We have to do checkout?

03 16 14 32 CMP Yes. It says configure camera, CM 3, LTC, black, BE forward, shutter, frame, LTC installation decal, record the time, and LTC checkout decal. Okay.

03 16 14 44 LMP Okay.

03 16 14 46 CMP So let's do a - Have you finished the installation decal?

03 16 14 51 LMP Yes. I'm ready for the checkout decal.

03 16 14 53 CMP Okay.

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03 16 14 54 LMP Okay. I veri - You ready?

03 16 14 56 CMP Yes.

03 16 14 57 LMP I verify the camera ... is closed. Circuit breaker's closed.

03 16 15 01 CMP P52, 146.

03 16 15 02 LMP Okay. I'm going to turn on the ...

03 16 15 07 CMP 06 NOUN 65.

03 16 15 08 LMP MAIN B. Circuit breaker SCIENTIFIC EQUIPMENT HATCH.

03 16 15 15 CDR Anybody want any 50 18?

03 16 15 16 CMP Yes. Get that?

03 16 15 20 CDR Yes.

03 16 15 21 LMP SCIENTIFIC POWER is on. AC POWER on 201, you can turn it on.

03 16 15 28 CDR On 100?

03 16 15 29 LMP 201.

03 16 15 30 CDR 201, right.

03 16 15 33 LMP All right. Turn your power on now, Stu. Mode, single.

03 16 15 38 CMP Okay. Power, on. Mode is single.

03 16 15 42 LMP Frame rate, eight per minute.

03 16 15 45 CMP Okay, wait just a second here. Okay, frame rate is eight per minute.

03 16 15 51 LMP Range, 10.

03 16 15 52 CMP Range, 10.

03 16 15 53 LMP Operate single frame for two frames.

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Day 4

03 16 15 57 CMP Okay, the FMC's working. Frame counter went up one.

03 16 16 01 LMP Mode to auto, three to five frames.

03 16 16 04 CMP Okay. Auto.

03 16 16 09 CDR Did you see it turn? Did you see the wheels turning over here, Ed?

03 16 16 10 LMP I wasn't watching. I feel them. Okay, I feel them. Go ahead. Auto, three to five frames.

03 16 16 18 CMP That was one, auto.

03 16 16 20 LMP Okay.

03 16 16 22 CMP Two, auto.

03 16 16 24 LMP All right. Verify SFC. We have.

03 16 16 27 CMP We have.

03 16 16 28 LMP And frame-controlled operation. End-of-film light, out.

03 16 16 33 CMP End-of-film light is out.

03 16 16 35 LMP Okay, turn it, Stu; I haven't seen it.

03 16 16 36 CMP Okay.

03 16 16 38 LMP Mode, standby.

03 16 16 39 CMP Mode, standby.

03 16 16 40 LMP Power, off.

03 16 16 41 CMP Power's off.

03 16 16 42 LMP Checkout complete.

03 16 16 44 CMP Okay. Let's get a time here off the clock. Okay, it'll be ... 87:66.

03 16 17 00 CDR 120.

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03 16 17 04 CMP 06, 65, and I'll ENTER on - 13:21. I -

03 16 17 15 CMP HACK. Okay. That was 13 hours and 21, 2, 3, 4, 5 - 13:21. Coarse time.

03 16 17 35 LMP What's the AOS time? ... page?

03 16 17 43 CMP About 8 after.

03 16 17 45 LMP Okay.

03 16 17 47 CMP Coarse time. Time was - time was - was 13:21. 13 ... 12, 13 - 13:21, 13:21 days. 7, 6, at a GET of 88:57:14.56. All right. Close up the camera ... What? All right. Okay, we configured the camera. Target 9, Descartes. We did not get a pad, did we? Initial range's going to be somewhere around 51. As a matter of fact, initial range will be 51.7. 51.7 at T-start.

03 16 19 26 CDR Did you get it up in time?

03 16 19 29 CMP Oh, yes. We've got a long way to wait.

03 16 19 31 CDR Okay, good.

03 16 19 34 CMP Okay, configure camera shutter: 1/200ths; range is on the pad, 51.7; intervalometer is 65. Going to bang them off one a second.

03 16 20 02 CMP Okay, I verify 200ths; range pad, 51.7; intervalometer; one and two frames; magazine W; frame number 5. LTC installation. Record time, 13:21, 766, 88:57:14. LTC checkout. Cycle CMC MCDE, FREE to AUTO. I don't want - We don't need that since we - you scratched out a - It had been changed. Okay, we're not changing the DAP. Did a VERB 49 maneuver to 352, 146. We'll get a tweak on this, I'm sure; 146 and 355. We're configured for big end forward. It's in the number 3 window, and it is the LTC camera.

03 16 20 58 CDR ...

03 16 21 00 CMP Okay, we'll get a tweak to the maneuver. We'll get a pad, and we'll be in business.

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03 16 24 08 CDR I guess you don't have any yellow pills, do you?

03 16 24 15 CMP One yellow pill.

03 16 24 16 CDR Well, do you need it?

03 16 24 17 CMP No. I got one. I brought it up here, but I got one on this cocoa ...

03 16 24 26 LMP There's your ... right behind you.

03 16 24 56 CMP Where do they have those, down in the pantry?

03 16 24 58 CDR Yes. Okay. ... AOS.

03 16 25 12 LMP ... because they're going to be passing pads like crazy.

03 16 25 18 CDR ...

03 16 26 34 CMP Well, we have the Moon back out, going by Tsiolkovsky. And we're jaded already. Two REVs and we don't even jump to the window on sunrise.

03 16 26 53 LMP We've had our second meal around the Moon.

03 16 26 57 CDR We what?

03 16 26 58 LMP We've had our second - -

03 16 26 59 CDR We've had our first one.

03 16 27 00 CMP Huh? When was the first one?

03 16 27 01 LMP We were eating during our first REV.

03 16 27 08 CMP No, we weren't.

03 16 27 09 LMP Hell we weren't! We were laying up here on the panel looking out the windows, and Al was passing food up. You were so excited that I guess you forgot it. That's what we were doing.

03 16 27 41 CMP Hey, Ed. Let me copy that topo pad, so I'll make sure I - I've got it.

03 16 27 48 LMP Be my guest.

~~CONFIDENTIAL~~

03 16 27 49 CMP Yes, I want to -

03 16 27 58 CDR You know, it sure does look like we're below the surface. You notice that, Ed?

03 16 28 07 LMP What do you mean, Al? You mean to look out the window?

03 16 28 08 CDR Yes.

03 16 28 09 LMP Yes. It does.

03 16 28 10 CMP Look at the horizon.

03 16 28 13 LMP Like we're way down.

03 16 28 15 CDR Some of those near craters stick up in the way of the far craters. Mighty low.

03 16 28 33 CDR We ought to be able to see Cone Crater fairly easily, though, for whatever it's worth.

03 16 28 40 LMP I think so.

03 16 28 46 CDR Cone and Star and Sunrise.

03 16 28 48 LMP Give me that ACS time again, Stu.

03 16 28 51 CMP About 08 or thereabouts.

03 16 28 52 LMP Well, it's already 09.

03 16 28 56 CMP Well, that's a wag [sic]. It says about 08.

03 16 29 00 LMP There we go.

03 16 29 10 LMP Houston, Apollo 14. How do you read?

03 16 29 25 LMP Roger. Read you loud and clear, here. We're standing by to copy map updates and photo pads.

03 16 53 08 CMP ... 933, 36.

03 16 53 11 CDR ... like hell. ...

03 16 53 17 CMP Say again?

CONFIDENTIAL

03 16 53 19 CDR I said there's a lot of ...

03 16 53 22 CMP And 23, 24, 25. ... on STANDBY. ... Roger. Power is on. Man, you got that lead time in just right, Gordon, for the transmission delay. Okay. 34, 36. We go AUTO and start the event timer.

03 16 54 09 CMP Here we go for the 16 crew.

03 16 54 31 CMP 2, 3, 4, 5, 6.

03 16 54 35 [Camera start]

03 16 54 43 CMP And she's running. Okay. And we've got T-start here at 24.

03 16 55 27 CMP ... 1, 2, 3 ...

03 16 55 55 CMP One plus 23.

03 16 56 53 CMP ... 21

03 16 57 07 [Camera speed change]

03 16 57 20 [Camera speed change]

03 16 57 24 CMP ... about frames 147 -

03 16 57 48 CMP Strange.

03 16 58 16 [Camera speed change]

03 16 58 37 CMP Roger.

03 16 58 39 LMF Roger. It seems to be functioning properly.

03 16 58 43 CMP Huh?

03 16 58 44 LMF It seems to be taking it up properly.

03 17 00 41 [Camera speed change]

03 17 00 46 LMF It's sticking. It's not taking - -

03 17 00 50 CMP No, I've got it. Stand by. 89:40:41 was T-stop.

03 17 01 00 [Camera stop]

CONFIDENTIAL

03 17 01 06 CMP Okay, Gordon, we got them. Let me write down something here, and I'll talk to you about it.

TIME SKIP

03 17 42 26 CMP I don't - No, I'm not in down here.

03 17 42 29 CDR You're not?

03 17 42 30 CMP No, I'm not on the front. Maybe it was just the camera coming up, because it was riding up. Maybe I just needed to push down on it. That feels good. Oh, hell. Just a second, Al, I've got to raise the damn thing back up again to get -

03 17 43 08 CMP No, it's cracked up here.

03 17 43 12 CDR Maybe this is your problem.

03 17 43 14 CMP Yes, it feels like maybe that. Okay. Let's bring her down now.

03 17 43 29 CDR Well I'll be durned.

03 17 43 31 CMP No, it's not -

03 17 43 39 CDR There it is.

03 17 43 40 CMP Now, there it is.

03 17 43 41 CDR Good?

03 17 43 42 CMP I'm good, if you are.

03 17 43 45 CDR Good.

03 17 43 57 CMP Okay.

03 17 44 16 CDR What do you suppose happened there?

03 17 44 17 CMP I think maybe that 65 frames a second is overtaxing the magazine or something. I think it's working. The magazine's taking up.

CONFIDENTIAL

03 17 44 35 CDR It started making that funny noise in here after it - The vibration ...

03 17 44 40 CMP On - on the camera, during the - during the run. Now, on this last run, it did it when I went to the single frame, but I had just finished up three or four frames at 65.

03 17 44 50 CDR Yes. Well, let's see. That's where you had it ...

03 17 45 02 CMP ... need some water ... Somebody want a drink?

03 17 45 07 LMP Yes. Okay. No. I'm going to try to use the bags. Sure you - That is the major item on my list.

03 17 45 23 CDR You about ready to go to sleep?

03 17 45 24 LMP Me?

03 17 45 25 CMP I am. I am flat ready.

03 17 45 32 CDR Okay, the canister comes out of where?

03 17 45 38 LMP The LiCH canister comes out of where?

03 17 45 49 CMP Nine into A, stow 7 and B-6.

03 17 46 29 CMP ... Okay. 123 286 ...

03 17 46 57 CDR ... in B-6. 9 into A.

03 17 47 20 CDR Okay, it's done.

03 17 47 23 CMP Okay, I'm marking it off.

03 17 48 08 CMP ... did you verify your tape motion, Ed?

03 17 48 17 CMP Okay.

03 17 48 58 CMP Ha, ha, ha. ... work on the DSKY now.

03 17 49 16 SC (Grunt)

03 17 49 27 CMP (Sigh) ...

03 17 49 30 CDR ...

CONFIDENTIAL

03 17 50 01 CMP On, crap. That's not fair. We're getting here. Went and called up a VERB - or NOUN 20, and now I've got to get rid of the son of a bitch.

03 17 50 31 CMP Thought I'd do a VERB 37 00. It's going to kill that VERB 79 wide dead band I've got going.

03 17 50 46 CMP Now how in the hell am I going to do that?

03 17 51 01 CDR What do you got going? Do you have a 79 going?

03 17 51 09 CMP Yes, and - without thinking I called up a NOUN 20.

03 17 51 17 CDR Yes.

03 17 51 19 CMP Now I've got a NOUN 20 on the son of a bitch.

03 17 51 28 CDR Well, you want - you want to leave that on there ...

03 17 51 36 CMP No.

03 17 51 47 CDR How about a - 16 65. You're still using the same - ... count ...

03 17 52 09 CMP Fitch is actually far enough off, but I'm afraid - Got - got about 20 off there in that piddling around (sigh). They wanted 286. Wanted a 10-degree dead band. I think I'm going to have to go back to that attitude. VERB 49 ENTER. Yes, I'm going to have to go back to that attitude ...

03 17 54 01 CDR How about a - How about a VERB 06? Is that ...

03 17 54 08 CMP Well, I just don't think they want - any - Anything on the DSKY is going - going to take - have to exercise the read counters.

03 17 54 57 CDR Get these jets off - off ... that change-of-pace plane.

03 17 55 14 CMP Yes. It will kill the - it will kill the VERB 79.

03 17 55 22 CDR Well, yes, but we'll need jets ...

CONFIDENTIAL

Day 4

03 17 55 25 CMP Well, see, we used a VERB - we're using the VERB 79 here to get a 10-degree dead band for the sleep period.

03 17 55 31 CDR Yes.

03 17 55 33 CMP So I don't want to go back to the -

03 17 55 35 CDR You mean you get ... gives you a new ... Is that right?

03 17 55 45 CDR See what I mean?

03 17 55 47 CMP Uh-huh, and we're there to 75, 80, 85; Okay. Let's - ENTER on that. We've got a blank DSKY, and we're there.

03 17 56 24 CDR You have blank - blank DSKY now?

03 17 56 26 CMP I have a blank DSKY; it's going to fire when it hits the edge of this 10-degree dead band, and then we should be good.

03 17 56 42 CDR ...

03 17 58 09 CDR Oh, yes. You all through?

03 17 59 01 CMP I guess I'd call them - what? You got a minus 35, 272, and then REACQ, huh? Okay, 80 out of 90.

03 18 00 02 CDR Want to use the Myrtle, Stu?

03 18 00 05 CMP Yes. I expect - might as well.

03 18 00 17 CMP RATE COMMAND, RATE COMMAND, RATE COMMAND.

03 18 01 06 CDR ...

03 18 01 32 LMP Okay. Got some yellow pills for the crew ... pantry, you suppose? Excuse me, Stu?

03 18 01 48 CMP Oh, I'm sorry.

03 18 02 22 CDR Where are the yellow pills?

03 18 02 58 CDR There are the yellow pills.

CONFIDENTIAL

03 18 03 52 CDR Okay, you want to talk over about tomorrow?

03 18 04 06 CDR Or do you want to get up a little bit early?

03 18 04 13 LMP Huh?

03 18 05 25 CMP Okay. From the time they have us getting up - They're going to wake us up at 99:30. Then - They're going to wake us up at 99:30; we've got an hour and a half listed for an eat period; then, they've got you putting on your suits. Are you all squared away on what you're going to take over?

03 18 05 31 CDR I think, if we just give ourselves a little extra time, we'll be all right.

03 18 05 34 CMP Yes. In fact, I've - Looking over this, I really don't see where we're going to be hurting.

03 18 05 38 CDR Well, we still ... one guy, the other guy ...

03 18 05 56 CMP You all don't wear helmets and gloves. You just take them with you?

03 18 06 00 CDR That's right. That's right.

03 18 06 07 CMP Yes. It won't take us long to get the tunnel clear.

03 18 09 40 CDR That's wild, isn't it?

03 18 09 50 CMP Sure is.

03 18 10 14 CDR Well, okay. Is that everything in the flight plan?

03 18 10 23 CMP Everything except chlorinate the water, as far as I can tell. Did you do the presleep checklist, Ed? You finished up the presleep checklist, comm and everything, didn't you?

03 18 10 40 CDR ...

03 18 10 47 CMP Oh, really?

03 18 10 50 CDR ... really.

~~CONFIDENTIAL~~

03 18 11 17 CDR Couldn't be much of ... now. Couldn't be much of ... now.

03 18 11 25 LMP Yes.

03 18 11 27 CMP What?

03 18 11 29 LMP Okay.

03 18 11 32 CDR ... should be minus 35. P72, right there.

03 18 12 00 CDR Okay, Ed. Lunar orbit of sleep. That's lunar orbit of sleep.

03 18 12 10 LMP Might be a problem.

03 18 12 53 CDR Okay. Why don't we just get up a half an hour early. Stu? ... schedule that at 99:30. If that's for sure, why don't we get up at 99?

03 18 13 09 CMP What time is that on the watch?

03 18 13 12 CDR Eight hours to the minute.

03 18 13 14 CMP Eight hours. That'll be 17:30.

03 18 13 28 CDR That sound reasonable?

03 18 13 41 CMP ...

03 18 13 44 CDR Huh? Oh, that's good. ... sounds all right.

03 18 13 55 CDR That way we'll be sure.

03 18 15 06 SC (Cough)

03 18 15 39 CMP Oh, did it ever!

03 18 16 58 CMP All right ... Where am I? Oh, there I am.

03 18 18 49 CMP If I can get out of your way here. I keep ... my feet tripped over.

03 18 23 04 CMP Go ahead, Houston. 14.

~~CONFIDENTIAL~~

03 18 23 26 CMP Well, I'll tell you what. We ended up with the - the same trouble. Let me - let me run through and tell you what did. Let me get the flight plan out here.

TIME SKIP

03 19 26 44 LMP You want the towel, don't you?

03 19 26 53 CMP What the hell. I thought I had a used towel over there.

03 19 26 57 CDR ... anyway.

03 19 27 03 CMP Here, here's a towel.

03 19 27 28 CDR Okay. ...

03 19 27 54 CMP Well, you're supposed to do like I'm thinking, not what I say.

03 19 28 36 LMP And let me have the water gun. The top is on it.
...

03 19 30 04 CMP Yes, that ought to do it.

03 19 30 07 LMP ...

03 19 30 10 CMP What?

03 19 30 11 LMP ...

03 19 30 13 CMP No, put the - put the casing back on it, and use it to twist it off.

03 19 31 11 CMP What? You shouldn't - as long as you don't have anything in that casing; you're not pushing in on the needle.

03 19 34 53 CMP Hey, I think the more - I think from here on out, I'll chlorinate the water (laughter).

03 19 34 57 SC ...

~~CONFIDENTIAL~~

03 19 35 00 CMP Okay, thank you. Appreciate that (laughter).

03 19 35 33 CMP It's amazing how fast you can change your orientation.

03 19 35 34 SC Yes. ...

03 19 35 48 CMP Man, I looked out here a little bit ago - two REVs ago as we were coming out of the darkness - farside terminator, looking down there - and I - and I didn't know how I was oriented or how - which way the terminator was even running, and it looked just exactly like you were falling straight down - into the surface.

03 19 36 46 CMP Yes, I'm ready.

03 19 36 47 SC Huh?

03 19 36 48 CMP I'm ready.

03 19 39 50 CMP I just saw a flash - with my eyes wide open.

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

DAY 5

04 02 49 10 CMP I believe you cut him off, Edgar.

04 02 49 12 LMP Yes. Cut him off in midsentence. Yes. We got the two things he wanted.

04 02 49 26 CDR ...

04 02 49 34 CMP They need high bit rate.

04 02 49 47 LMP Houston, 14. Do you read now?

04 02 49 49 CC 14, this is Houston. Roger. We are reading you about 5 by 4. Over.

04 02 49 58 LMP Okay. I'm giving you PRIMARY SERVO ELECTRONICS, PRIMARY TRANSPONDER, and what else did you want?

04 02 50 03 CDR Oh, I'm sorry. Yes. Let me - -

04 02 50 04 CC ... We want to go back to TRACK mode, MANUAL; and we'll use the positions that you have set on the PITCH and YAW dials at present.

04 02 50 15 LMP Okay.

04 02 50 30 LMP Okay, Houston, there's MANUAL.

04 02 50 32 CMP Say again?

04 02 50 43 LMP God damn it. We have LOS? At what time?

04 02 51 18 CDR ...

04 02 51 21 CMP No, I didn't eat that last night. Never got around to it. Why don't you just leave it there? Maybe I'll eat it.

04 02 51 28 LMP Houston, 14. Do you read?

04 02 51 29 CMP Yes.

04 02 51 31 CC Roger, Ed. We're reading you. We'd like you to do a normal manual acquisition, switching back to WIDE BEAM and then coming on over.

~~CONFIDENTIAL~~

CONFIDENTIAL

04 02 51 42 LMP Okay.

04 02 52 12 CMP Okay. I'll start mixing up some chow. Al, what would you like first?

04 03 04 13 CMP Was that LOS? Must have dropped them. Yes. How in the hell does Bruce think I'm going to copy that shit like that? Oh, he said, "Well, we're 40 seconds from LOS," so he just starts reading, you know, just as fast as he can; and, you know, there's no way you can - -

04 03 04 30 CDR ... Hycon.

04 03 04 33 CMP Yes, this is - what we're going to do with the Hycon - They said they duplicated all the problems in the - in building 4, and it's a low-power problem, and they got all the - all the symptoms. I don't know why they want me to ... - -

04 03 04 54 SC ...

04 03 05 14 CMP Let's get out the flight plan there.

04 03 05 17 SC ...

04 03 05 22 CMP Verify DSE tape motion; LOW BIT RATE. Yes. It's moving. Okay. We verified that. Now we're in an eat period.

04 03 05 39 SC ...

04 03 05 48 CMP Well, they don't want him to do anything until the AOS, at least, which is at 100:30.

04 03 05 51 CDR ...

04 03 06 13 CMP Cried the king.

04 03 07 04 CMP "Screw them," said the commander, and all the subjects began to fornicate. That was a Roosa original, 1971, at 99 hours and 47 minutes into the midnight flight of Apollo 14.

04 03 07 29 SC ...

CONFIDENTIAL

04 03 07 31 CMP Yes, okay. Now, you - you went through the manual procedures, and you get three-quarters signal strength?

04 03 07 36 LMP ...

04 03 08 45 CMP Would you - would you like some more? I got several packages here. I don't - I just don't chew gum, and I - pack rat, like in survival, you - I save everything that I don't - -

04 03 09 38 CDR ... number ... on the top and the bottom ...

04 03 10 08 CMP I think that'd be a good plan.

04 03 14 25 LMP I'm sure they've got some - some rule that's mandatory for the biomed for the EVA.

04 03 14 59 CMP You want to bet a six-pack? I mean, I don't know, but I'm just - the way the system operates.

04 03 16 01 CMP I don't know why Bruce was in such a hurry to do this Hycon troubleshooting, anyway. I don't know when he thinks I'm going to do that.

04 03 19 27 CMP Hey, Ed. ... get Myrtle back ...

04 03 19 43 CMP ... comm carrier.

04 03 19 52 CDR ...

04 03 20 25 CDR What?

04 03 20 27 LMP ...

04 03 20 34 CDR I think ...

04 03 20 45 CMP Yes.

04 03 21 19 LMP Do you have anything else you can throw away ...? ...

04 03 24 00 CDR Sure that's exactly what you wanted ...?

04 03 28 00 CDR You don't have it on, do you?

04 03 28 13 CDR Just want to make sure, you know. ... TPI day, I didn't want the LMP to get nervous here. After ...

CONFIDENTIAL

04 03 31 28 CDR It's down in the bottom of that temporary stowage bag that we rigged up for you. Leave the top part open.

04 03 31 50 CDR Now, don't put it on top of any cameras or anything. I think so; I know ... It can sure get messy.

04 03 34 00 CDR The only camera I really need is ...

04 03 34 15 CDR Yes, it goes flying off into space ...

04 03 34 22 LMP What in hell do you expect?

04 03 34 25 CDR Yes (laughter).

04 03 34 32 LMP ...

04 03 34 40 CDR I get to go around and drag all the stuff back into the command module, and then ... (laughter).

04 03 34 47 LMP That's it. Just ...

04 03 37 32 CDR ... here. How about you mixing up the cold part, and I'll mix up the hot part. You agreeable to that?

04 03 37 40 LMP Okay.

04 03 37 53 CDR You know, I wish they wouldn't put that string on all that. I mean, it helps you find the stuff, but it's a bitch to - -

04 03 37 59 LMP ...

04 03 38 01 CDR Yes. What do you do with all the loose pieces of string? Yes, getting back to Stu. ...

04 03 38 58 CMP You know, they really - like say, like with the PDI or TEI, or something like that - you know, they take a one ... and - -

04 03 44 09 SC ...

04 03 44 21 CMP Well, that - that helps with the ... They - they'll take ... the one pad, and they claim that ... go three pads ...

04 03 44 44 CMP One in ... two.

CONFIDENTIAL

04 03 45 38 CMP Seven is standard ...

04 03 50 21 CMP Seem a lot lower - 40,000 feet over the Moon than 40,000 feet in an airplane - don't you? It's like you could reach down and touch it.

04 03 51 09 CMP I still don't know what gave us our trouble a couple of times.

04 03 53 16 CC Apollo 14, Apollo 14; this is Houston. How do you read. Over.

04 03 53 24 CMP Read you 5 square, Bruce. How me?

04 03 53 27 CC Roger, Stu. We're reading you with a good bit of background noise. We've got a few things to pass up to you at this time, if you're ready to listen.

04 03 53 43 CMP Okay. Stand by just 1.

04 03 53 45 CC Okay. In the meantime, Stu, for you or Ed, we'd like you to try a normal acquisition again on the high gain antenna, and, if that's NO GO, try acquisition in MANUAL and medium beam width. Over.

04 03 54 05 CMP Okay. Let me get down here and give it a go.

04 03 55 19 CMP Houston, how do you read 14?

04 03 55 21 LMP Al, are you using the same roll-on cuff?

04 03 55 25 CDR No.

04 03 55 26 CC Okay. Loud and clear, 14.

04 03 55 30 CMP Okay, Bruce - -

04 03 55 31 LMP Well, I dried mine, Al.

04 03 55 32 CMP - - doesn't seem to be doing too good. Still can't get the lockup solid all the way.

04 03 55 37 LMP I just wonder about - bacteria that's in there.

04 03 55 38 CMP I'm in AUTO and MEDIUM, now, and that's where you want it?

CONFIDENTIAL

04 03 55 42 LMP Just - just concerned about the bacteria that's in there.

04 03 55 45 CC That's affirmative, 14. And we're checking out Ed's biomed.

04 03 55 54 CMP Okay. Ed, they're checking your biomed.

04 03 55 59 LMP Okay.

04 03 56 01 CMP (Sneeze)

04 03 56 02 LMP That's what I hoped they might do.

04 03 56 03 CC Okay. In the meantime, an item of general interest on your orbital status. You started out somewhat high and are decaying at a slightly greater rate than predicted. However, the altitude at PDI will still be about 46,000 feet. That is 46,000 feet or 8.3 nautical miles; so your pericyynthion's still good. Over.

04 03 56 11 CMP Man, that'd be great, docking this baby at night. You know, that's a beautiful sight. Done good on that one. A little nighttime under your belt.

04 03 56 23 CDR Okay. There's LOS; tape motion.

04 03 56 27 LMP Great.

04 03 56 28 CDR You're on high gain and set up in the proper angles.

04 03 56 30 CMP Okay, sounds like good planning.

04 03 56 33 LMP That gives us more fuel than ever.

04 03 56 36 CMP 46,000 feet at PDI.

04 03 57 02 CC And, Apollo 14, Stu. Map update, REV 11, if you're ready.

04 03 57 07 CMP Negative; stand by 1.

04 04 57 49 LMP They got those torquing angles on the ground, didn't they?

04 04 57 51 CDR Yes. They said they got them.

CONFIDENTIAL

04 04 57 52 CMP They got the torquing angles, and I passed them ...

04 04 57 56 CDR Okay. One thing you haven't done, Stu, which you can get later - is your cameras are all here - You have to get that ...

04 04 58 02 CMP Yes. I - I'll get all those ...

04 04 58 07 CDR Okay. We're going right through gimbal lock on the GDC, and it's going right by. IMU's fine. Okay. CMP is removing the - tunnel hatch. CMP's removing the probe now. Okay. What was the DELTA-P, by the way, Stu? I'll just jot it down here.

04 04 58 43 CMP 0.28. I wrote it down there.

04 04 58 46 CDR Oh, did you? Okay. It's down again. Okay. 180 is 102:03:40. Three. That'll be 23:26. I could set it on 34.

04 04 59 45 CDR Okay, Stu. Your timer is running - coming up to 60, which is - the zero of which will be your 180 update time. Okay. You verify tape motion?

04 05 00 05 LMP That's verified.

04 05 00 08 CDR Do I record the tunnel angle as plus 0.9?

04 05 00 12 CMP ...

04 05 00 15 CDR All right.

04 05 00 38 LMP I didn't get to brush my teeth this morning.

04 05 00 45 CDR Okay, I'll crank in these. Get that GDC set up. 007.5 ...

04 05 01 28 CDR Can we help you?

04 05 02 02 CDR Do you want to use the spring or you want to use the strap?

04 05 02 07 LMP Need the spring to hold the nose down here.

04 05 02 28 CDR Oh, I see what tool R is for, is to take those Phillips-head screws off the whole cover, I guess.

CONFIDENTIAL

Day 5

04 05 02 45 LMP Not very tight. Yes. Go around it one. Much better (clearing throat).

04 05 03 15 CDR Let's see - we just leave these out in the bag here, I guess.

04 05 03 18 LMP Yes.

04 05 03 20 CDR What is it? Okay. Plus 0.9. Very good.

04 05 03 57 CDR Okay. Theoretically - on the overall scheme of things, 101:50 - -

04 05 04 03 LMP Roger. ... all the way on through.

04 05 04 05 CDR No. 101:52. So you got 8 minutes.

04 05 04 09 LMP (Cough) Okay. I think we're going to be ahead of it.

04 05 04 12 CDR Yes. We're going to be ahead of the time line.

04 05 04 50 CDR Boy, I sure hope those guys don't get nervous about that BAT 5.

04 05 04 54 LMP I do, too (clearing throat). You didn't put down anything.

04 05 05 00 CDR Well, jeez, he had a load on it the other day and the damn thing was holding up, wasn't it?

04 05 05 03 LMP Yes, but they're - -

04 05 05 04 CMP ...

04 05 05 05 LMP All right. We'll start through.

04 05 05 07 CDR Okay. We'll put down that you're starting up at 101:46.

04 05 05 14 LMP I'll give you a little room there, Stuart, and I'll come right over ...

04 05 05 32 CDR Going to get off - Turn your switches off before you get off comm.

04 05 05 35 LMP Yes. I'll holler for it. Might as well stay on comm here - -

CONFIDENTIAL

04 05 05 39 CDR I don't know who the hell is going to do it for you.

04 05 05 41 LMP Pardon?

04 05 05 42 CDR I don't know who's going to do it for you, Ed. I can't get over there, and Stu's going to be getting his suit on. You better - turn them off before you leave.

04 05 05 51 LMP Okay.

04 05 05 55 CMP ...

04 05 05 57 LMP Turned the comm switches off.

04 05 06 01 CDR You can just yell down, can't you?

04 05 06 03 LMP I guess so.

04 05 06 05 CDR Yes. See, otherwise - Stu'll be suiting, and - You probably can move a hell of a lot easier with that suit on - without those damn things on, too. Okay. Okay. How you doing, Stu?

04 05 07 17 CDR Okay, Stu. Can I help you with your suit in any way?

04 05 07 21 CMP Say again.

04 05 07 22 CDR Any way I can help you with your suit now?

04 05 07 25 CMP ...

04 05 07 32 CDR Yes, we're okay. All we've got is a switch to throw on this LM power. Okay. After the suit, next thing we've got is a switch to throw, and I can do that. That's 13 minutes from now. And the next thing after that - What's that?

04 05 08 34 CDR Okay. We're in attitude. I'll go to ENTER now. I'll aline the GDC for you, while I'm here. ROLL 1; ATT SET, IMU.

04 05 09 25 CDR GDC. Okay, Stu. You've got a good GDC.

04 05 09 58 CDR Are you getting your suit on?

CONFIDENTIAL

04 05 10 03 LMP No.

04 05 10 11 CDR Okay. Probe was removed. Drogue was removed.

04 05 11 07 CDR Yes, I'm aware of all that. The HIGH GAIN is - is selected from new attitude, and Ed verified - tape motion. Okay, here's a VERB 48 here. Do we change the DAP load here? Yes, we do. Go to wide dead band, here. Okay. Let's see, we just completed the 48 - 49 maneuver, Stu. And, I've gone to ENTER. We're sitting in POO in attitude - I'll just go ahead and change the DAP right here from narrow to wide without getting ... on it, right?

04 05 12 01 CMP ...

04 05 12 03 CDR We've gone through the 49; got the 58 gainer added, so we're sitting here. We got a narrow dead band; the flight plan says we swing to a wide dead band, here; going to do that right now without changing phase plane and getting any jet firing. Okay. VERB 48 ENTER; VERB 21 ENTER; and I'm going to a 2 and all 1's. Okay. llll. ENTER. And we're still using B/D ROLL. B/D ROLL is set up. We'll PRO on through. Okay, babe, you're in wide dead band.

04 05 13 17 CDR How's our friend, the LMP, doing?

04 05 13 41 CDR Got to go to a new REFSMMAT, Stu. Going to go to a new REFSMMAT. Have to go to a new REFSMMAT, when I get up in the LM. For me, I mean.

04 05 13 53 CMP Yes.

04 05 13 55 CDR Okay. Tell him, here I come. Nine reset, off. 101:54:00.

04 05 14 05 CMP 101:54:00.

04 05 14 19 CDR Okay, 4-D, is that zero? Okay, a quick check on it. Okay, very good. We're through with that page. Except for you getting your suit on.

04 05 14 32 CMP Yes. ...

CONFIDENTIAL

04 05 14 56 CDR (Laughter). Okay. It looks like he's still about -
4 minutes ahead. So, I'll go up 4 minutes ahead.
That'll put me 102 - 2:05; now it's 2:01. Okay.
Stu?

04 05 15 35 CMP Yes.

04 05 15 36 CDR Stu, I'm going to head on up there. Stay a little
ahead of things.

04 05 16 01 CDR Okay. Left-hand row, top switch, off.

04 05 35 35 CMP I think that's that damned empty box that's been
floating around for 3 days.

04 05 42 00 CMP Hey, Al. Here's a piece I think came out of you.
I think there's a fitting down here that came from
you. I don't know if you need it or not. No.
Look - Can - can you look over the edge? See it?
Where do you leave it? In here? Well, it was
floating out here. Where did he have it?

04 05 42 57 CMP Okay. I thought it may have come out of the LM.

04 05 45 10 CMP Stand by 1.

04 05 45 32 CMP Yes. Yes, just a second.

04 05 46 11 CC Kitty Hawk, Houston.

04 05 46 18 CMP Go ahead, Houston; Kitty Hawk.

04 05 46 21 CC Okay. We're ready with some updates - -

TIME SKIP

04 06 50 38 LMP Understand. 100, all zeros, 00072.

04 06 50 49 LMP Do you have a - an LOS time for me, Fredo?

04 06 50 55 CC Okay. I'm showing LOS in about 8 seconds.

04 06 51 03 LMP Thank you.

04 06 55 44 LMP How you doing over there, Stu?

CONFIDENTIAL

04 06 55 47 CMP Okay.

04 06 56 12 LMP Hello, Stu. How do you read?

04 06 56 14 CMP Loud and clear.

04 06 56 15 LMP Okay. Are you recording E-data on this pass?

04 06 56 20 CMP That's affirmative.

04 06 56 21 LMP Okay.

04 06 56 25 CDR How you doing over there, Stu?

04 06 56 26 CMP Okay. I got a little behind on my suit check. I left these other suit hoses on FLOW instead of OFF, and - so that kicked me a little behind by the time I psyched that out, but I'm about to catch up.

04 06 56 43 LMP Okay - -

04 06 56 44 CDR It looks like we're back on the time line ourselves. We're going to proceed with our PGA integrity check now.

04 07 02 15 LMP *** check the tunnel ... - -

04 07 02 16 CDR Stu, has the tunnel been vented?

04 07 02 20 CMP It's been at greater than 3.5 pounds, and I don't have my roll back on yet. It passed the check. I'm just getting my gloves off now. I'll get my roll jets on, and I'll trim you up to the AGS CAL.

04 07 02 38 LMP Okay. We not - we're not quite there yet. Thank you.

04 07 02 42 CDR We're ahead of the time line, Stu, so there's no hurry.

04 07 06 02 CMP Hey, are you firing jets up there?

04 07 06 05 CDR No, we just dumped a little of the cabin O₂ to check the suit valves - is probably what we pushed you - what gave you a little push.

CONFIDENTIAL

04 07 06 19 CMP Okay. Man, that went good.

04 07 06 32 CDR How about that, babe? I guess maybe they didn't make allowance for that in computing your - How goes it?

04 07 06 40 CMP Yes. They ought to have a call for me to go FREE or something there.

04 07 07 31 CMP Okay, I'm going to trim you up for the AGS CAL.

04 07 07 34 CDR Okay. Good.

04 07 08 22 LMP You know, Stu, on that DEPRESS firing, I guess there's nothing we can do except squirt a little bit out, and you'll have to stop it. It costs you fuel, under any circumstances, I guess.

04 07 08 32 CMP Yes, but see, I have to start a maneuver back to the AGS CAL attitude anyway. So - But no sweat. I'm going to - I'll go - -

04 07 08 44 CDR How are you doing on the fuel? How goes it ... anyway?

04 07 08 49 CMP I didn't have time to plot it.

04 07 11 35 LMP Stuart, when you're through with your maneuver, let me know, please, and I'll go ahead with my check.

04 07 11 42 CMP Okay.

04 07 15 29 CMP Okay, Ed, I'm here. But we ought to wait a minute or 2 here to make sure the rates are damped.

04 07 15 35 LMP Okay. This test is pretty gross, so it doesn't really hurt anything. This is for my rate gyros.

04 07 15 47 CMP Okay. All the rates are pretty well damped.

04 07 15 52 LMP Thank you.

04 07 17 41 CDR Okay, Stu, you ready for a snapshot on the NOUN 20?

04 07 17 47 CMP Okay. Get a VERB 06 55 up. I - I mean a NOUN - VERB 06 NOUN 20.

CONFIDENTIAL

04 07 17 54 CDR Okay.

04 07 17 56 CMP VERB ... VERB 06 NOUN 20, and I'm ready to ...

04 07 18 07 CDR One -

04 07 18 08 CDR MARK.

04 07 18 09 CMP Hey, give me another mark on that, AL.

04 07 18 16 CDR Okay. VERB 06 NOUN 20. Stand by, 3, 2, 1 -

04 07 18 25 CDR MARK.

04 07 18 26 CMP Okay, on your mark, I read plus 00, plus 69, plus 11304, plus 02288.

04 07 18 42 CDR Okay. I had as a GET 103:58:25, 00769 - That's a good one - 11304, 02288.

04 07 18 58 CMP That's affirmative.

04 07 18 59 CDR Okay.

04 07 20 20 CMP Okay, I just switched comm on ... How do you read?

04 07 20 23 CDR Beautiful. Loud and clear.

04 07 20 27 CMP Okay.

04 07 21 06 CDR Okay, Stu, could you verify that you have a B-3 thruster, off, o-f-f? Radar TRANSPONDER, OFF, O-F-F.

04 07 21 14 CMP Verify the transponder is off, and ...

04 07 21 20 CDR Okay.

04 07 21 21 CMP And verify G&C thruster 3 is cff.

04 07 21 24 CDR Good show. I'm going with the rendezvous radar check. Be back with you momentarily.

04 07 22 23 LMP *** Stu. I'm ready to start my AGS CAL.

04 07 22 36 CMP Okay. The rates are damped, and I'm going CMC, FREE, now.

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04 07 22 40 LMP Okay.

04 07 24 01 LMP Okay. You say you're CMC, FREE, now. Is that affirmative?

04 07 29 30 LMP Stu, you can enable all thrusters, except B-3.

04 07 31 58 CMP Say, Al, how much longer do you think it'll be before I can get B-3 out?

04 07 32 03 CDR Just a minute.

04 07 33 32 LMP It'll take about 2 more minutes, Stu.

04 07 35 01 LMP Okay, Stu, you can enable B-3.

04 07 35 07 CMP And can I turn my transponder off?

04 07 35 11 LMP Roger; that's affirmative.

04 07 35 12 CDR Affirmative.

04 07 36 00 CMP Okay. Are we going to start a maneuver?

04 07 36 02 CDR Okay.

04 07 36 03 LMP Okay.

04 07 39 54 CMP Hello, Houston. Do you read Kitty Hawk?

04 07 40 03 CMP Okay. ... standing by for a GO for SEP.

TIME SKIP

04 08 15 54 LMP And the camera has started, Fredo, as we crossed Lalande N and NA.

04 08 16 07 LMP Might even get a picture of Stu ahead of us; we're crossing Lalande C.

04 08 18 03 LMP Okay, Fredo. We're coming over Turner Crater. It looks just like on the map as we approach the site.

04 08 18 36 LMP They don't seem quite as long as on the map, Fredo.

CONFIDENTIAL

Day 5

04 08 20 27 CDR Okay, Houston. We've spotted the general - the general area of the landing site from Rima Parry on in. We didn't spot Cone Crater on this pass, however.

04 08 20 52 LMP And, Fredo, as we come up on Lansberg here, it's - the terminator's running right across it. And it is a big one. It really has some - a steep rim - or rather a high rim, a very noticeably high rim for here - from - from here. And it's right - the terminator goes right through it.

04 08 44 22 CDR Go ahead, Houston.

04 08 44 36 LMP Was that for Antares?

04 08 44 42 LMP Okay. We'll get it going around the corner.

04 08 45 00 LMP Hey, Houston, clarify -

04 08 45 39 CMP Kitty Hawk, Antares.

04 08 45 41 LMP You're loud and clear.

04 08 45 43 CMP Okay ...

04 08 45 47 LMP Okay. And you have it.

04 09 07 31 CMP Okay, Antares. How do you read on VOX?

04 09 07 37 CDR Okay. Loud and clear.

04 09 07 38 LMP Loud and clear. Tape recorder's on, S-band - ...

04 09 08 03 LMP Houston, I have you locked up on the steerable.

04 09 08 15 LMP Okay, let me keep you honest, Al.

04 09 08 28 LMP I ... hold off on it until you do.

04 09 08 32 CDR Give me about 5 seconds, Stu. I need another 5 seconds.

04 09 08 38 CMP ...

04 09 08 41 LMP *** Okay, BIOMED *** LEFT; PCM *** HI.

CONFIDENTIAL

04 09 08 47 CMP ... zero. Will you be ready to go at 5? Are you ready, Al?

04 09 08 55 CDR We're ready. Go.

04 09 09 01 CMP And you're hanging on the end of the probe. We'll wait until motions damp here. Okay. We seem real steady. I'm going to back off from you.

04 09 09 15 CDR Okay. Very good.

04 09 09 28 CDR Okay. We had a normal undocking, Houston.

04 09 09 36 LMP Okay. DEAD BAND, MIN; VERB 77; go to POO.

04 09 10 12 LMP Stu, are you going to be able to burn on time? Okay. We don't see you, but I guess we will when you light off.

04 09 11 03 LMP Give us a 15-second warning if you - can, Stu.

04 09 11 14 CMP About 35 seconds. Have 30. EMS, NORMAL.

04 09 11 21 LMP Great, we're watching. We're with you. Good; keep going.

04 09 11 59 CMP Okay.

04 09 12 00 CMP SHUTDOWN.

04 09 12 02 LMP Gee, we sure didn't see a thing, Stuart. Oh, I just saw a flash up there. His tracking light.

04 09 12 19 CDR Huh? See his tracking light on or something?

04 09 12 28 LMP Saw a couple of flashes.

04 09 12 31 CDR Yes - -

04 09 12 49 LMP You have a mighty invisible engine, Stu. It didn't have anything we could see at all from here.

04 09 16 42 CMP Okay, Ed. The burn went off. Surprisingly enough, it was 2-foot-per-second overburn; I turned it back to - to one and ...

CONFIDENTIAL

04 09 16 57 LMP That's interesting, Stu; we never saw your burn at all; but at the same time, when you burst into sunlight, you were right ahead of us. We were pointed right at you, but we didn't see a thing.

04 09 20 47 LMP Stu, we ha - have your - your apogee/perigee numbers for comparison, if you'd like them.

04 09 20 53 CMP Okay. I've got a 53.9 by 56.0.

04 09 21 00 CDR Okay, we're showing 56.1 by 63.5.

04 09 21 07 LMP Good enough.

TIME SKIP

04 10 43 44 CMP ... 1/200th - and, I guess, fire a frame, remove the magazine, look at the slit, see if it's an inch from the side rail - and I guess I see some sprockets in there, and then - if it is 1 inch, I'll put the magazine back in, fire another frame, and check that the slit is still there. If it's out in the center somewhere - Well, then we've got big problems.

04 11 28 20 CDR Go ahead, Houston.

04 11 28 45 CDR Okay, stand by. Let's get locked up on the main lobe, Fred.

04 11 29 08 CDR And, in the meantime, do you still read me?

04 11 29 15 CDR Okay, ASCENT BATs went on at 108:01:45.

04 11 29 33 CDR ...

04 11 29 35 LMP Okay.

TIME SKIP

04 13 38 11 CMP Houston, 14. How do you read? ...

04 13 38 30 CMP Well, how're the troops of Antares making out? Do you have an estimate on the landing spot yet, Ron?

CONFIDENTIAL

04 13 38 51 CMP How far from the spot? Did they - they come right in on the first pick?

04 13 39 05 CMP Roger. Are they right on the target?

04 13 39 26 CMP Oh, okay.

04 13 43 41 CMP Houston, 14 - Kitty Hawk.

04 13 43 51 CMP Hey, Ron, got any word on how the low-altitude pass on 14-1 and the high-altitude compare?

04 13 44 11 CMP Okay.

04 13 44 36 CMP Okay.

04 14 14 04 CMP All right, Ron. I tried to change the camera and put the sextant on and take a look at the site.

04 14 40 44 CMP And, Houston; Kitty Hawk.

04 14 40 51 CMP Hey, Ron. Has - Is somebody thinking up an - any words about our Descartes photography? Does it look like the Hycon's wiped out; are we going to do the COAS or - Any decision on that?

04 14 41 13 CMP Okay.

04 14 41 20 CMP And - somebody ...? Does it look like the Hycon's wiped out?

04 15 15 35 CMP Left, left, and ...

04 15 18 31 CMP That son of a bitch. ...

04 15 21 43 CMP Okay, we're getting ready to start the zero-phase observations on target 1. I'm now running - DET was started at - T-start at 111:59:43 and I'm waiting to try again.

04 15 22 20 CMP First target at 8:07.

04 15 23 26 CMP ... 5.

04 15 23 43 CMP Okay, starting at 9:05.

04 15 23 58 CMP ... yet. If not ... -

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04 15 24 29 CMP And approaching 4 minutes.

04 15 25 02 CMP Okay, there are my targets. Targets A, B, C.

04 15 25 26 CMP Okay, standing by to start the time. That's 5 minutes.

04 15 25 43 CMP MARK. Intervalometer going. Okay, I have targets A, B, and C. C will be the first into the zero-phase. Picked them up without any difficulty at all. ... anyway. Intervalometer ... again.

04 15 26 14 CMP And A, B - Okay, looks like C is just about in zero-phase now. And I really have lost C at zero-phase. That's a pretty good picture there. As it moved into zero-phase, it was essentially wiped out.

04 15 26 38 CMP Now it's coming back out again.

04 15 26 46 CMP Okay, B. You just almost lose B going to zero-phase. I can tell where it is by the other craters - pointing at it. But, if you didn't have that help, it'd be tough.

04 15 27 12 CMP And now we're going into - A's going in toward zero-phase. In fact, I'm quite surprised how washed out they do become. I had anticipated I would be able to stay with them a little more than that.

04 15 27 33 CMP Well, we're going - It's 7 minutes, so A will be moving towards zero-phase. And it's pretty much the same story. Zero-phase is that - is that condition - it - it really - Kind of surprising how it - how it wipes it out. I think you can tell the general area, on B in particular, that with the lead-in, you could - you could find it. With - with B, it's pretty much totally wiped out at - at zero-phase, and A had a little better landmarks around it.

04 15 28 25 CMP Okay, I'm switching to second target now. And A shows up extremely well. B is - you can see B here now. It's just starting to go into - into zero-phase as it moves on up. But B is a - B's a mighty rough target, even without zero-phase.

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04 15 29 09 CMP And you can - you can hang onto A pretty well. B - B, just - I just didn't find long enough to give a good - a good impression on that one - on that one. I guess, overall, I'd rate it - at -

04 15 29 47 CMP But A in - in target 2, you can almost hang onto - B in target 1 -

04 15 30 08 CMP Now, of course, target 2-B is hard to find even under good conditions, so - but it'd be impossible at the - at the zero-phase point. And I'm going to quit now, and I'll give you a little summary here. I'll rate these as I - by the criteria that we set up. Okay, on target 1, I'd rate C -

04 15 30 45 CMP Okay, I'm going to turn off the intervalometer. No. Let it run for another 20 seconds. But I - I'm so far out, I - I really can't - It says you got to let the DAC run until 12:24. Okay. All right, I'd rate - I'd rate C in area 1 - I'd rate C as low; B as medium, and A is - is low; 2-A, medium; and B, very low.

04 15 31 52 CMP I think what would really help you is - is relief around, like C was out pretty flat. And then, when it got zero-phase, it pretty well wiped it out. But - okay, and on my mark, the DAC will be going off. Stand by.

04 15 32 11 CMP MARK. I let it slip one.

04 15 32 13 CMP MARK. There, that was the last picture on targets 1 and 2.

04 15 32 21 CMP And just a little more on the debriefing. I think if there's some relief around, it helps you quite a bit. Like C was out flat, and you'd lose it. B, I had the good chain of craters going into it, so you could pick that up, and - and A, also. It was the landmarks that really - really had you pick it up. But when it's out flat, it just washed it out completely.

04 15 33 08 CMP Okay. Houston, Kitty Hawk.

04 15 33 59 CMP 344.7, 340.9, ...

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04 15 34 17 CMP Hello, Houston. This is Kitty Hawk.

04 15 36 57 CMP Kitty Hawk. How do you read?

04 15 37 07 CMP Well ... I never saw B at all, and A ... pick up ... zero-phase, B was just completely wiped out. ... clue is ... some relief by you, even in zero-phase ... best of the three ... pretty well hang ... and A was about ...

04 15 38 31 CMP Well ...

04 15 38 38 CMP Okay ... on the tape ... this other ...

04 15 40 50 CMP ... loud and clear. ...?

04 15 41 09 CMP Okay, you've always been loud and clear ...

04 15 41 30 CMP Okay, Ron; are you going to let the tape run for the ... next sighting?

04 15 46 55 CMP And, Houston; Kitty Hawk. Do you want me to terminate the charge on B and start one on Able?

04 15 47 10 CMP Okay.

04 15 55 36 CMP Okay, thank you.

04 16 00 36 CMP Okay, I'll do that.

04 16 00 56 CMP And stand by.

04 16 00 59 CMP MARK. Camera's running. Five minutes. Okay, and now I can pick up to Ptolemaeus, to Ptolemaeus A, and I can pick up Bright Crater. Yes, even at this low elevation, targets A and B show up real well. The trouble of it is, it doesn't look to me like the camera's on target, but - They're a little too far to the left. But, anyway, I can't see targets - both targets A and B by themselves. I guess I used that little bright crater up by B, maybe as a gouge, but it showed up pretty well. There's no problem on acquisition, Houston. Appear to just be getting better as I - as I come up in elevation. Of course, I guess it wouldn't surprise me to come up here and see that I picked up the wrong target.

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04 16 02 18 CMP

I really don't think this camera's pointed right, Ron. It's boresighted right down - looks like the junction between Ptolemaeus and Alphonsus. But, anyway, my - both targets A and B - had no trouble acquiring these and no trouble sticking with them. Even A is the - the hardest; it's not quite as straight. Now B had a - had a bright rim and showed up at the very start of the - of the observation. A is - is a little more subdued, but it was quite easy to pick up and hang on to. And that's - that's really a no-sweat on - on this one, much - much easier than the - those on the back-side. In fact, I rated some of those with zero. And I'd have to give them up on - on both these targets - Cone Crater.

04 16 03 34 CMP

And the hard part is over, once you acquire them at that low elevation. In fact, the elevation is as difficult as - any sort of Sun problem. That would be here, as we go - go towards the zero-phase; I guess it's probably still about 08:40 and I'd guess about 40 minutes to go. It's still hanging in there right now. No - no problem at all. Particularly B, it's - it hasn't the - the bright surface on the center across the crater - that makes it that much easier. Let's see, I can see the zero-phase. And I guess the camera was pointing at it as we get up here closer. And I can see zero-phase now, approaching target A, so this should be a - a good test. Been no problem to acquire up to now.

04 16 04 39 CMP

There's zero-phase just about on A, and the camera took the picture. Okay, we went through zero-phase on A with - with no problem - hanging on to the landmark itself.

04 16 04 56 CMP

Zero-phase is passing B - at this time. And it, again, is definitely no problem.

04 16 05 12 CMP

And now, as we come out of the - out of the zero-phase, it gets constantly better, of course. And I'll be switching targets at 09:58. It's 09:24 now. Both targets at Ptolemaeus are ready to pick up. Of course, it's no problem now picking those up.

CONFIDENTIAL

Day 5

04 16 05 59 CMP Okay, we're going to switch now and take a look at - at Parry. And - actually, this one here is again extremely easy. You can pick up both - both targets A and B as soon as you see it, no sweat. I think you'd use the - of course, you'd use the - Parry and Parry M to guide you into the area. But once you got into the area, why, A and B just stand out so good that, here again, it's - primarily - it's - the elevation angle helps, because we're up a little higher and - and, also, the bright crater stages show up extremely well. It's like you got the crater with a bright rim. It really helps with low elevation.

04 16 07 08 CMP In fact, zero-phase is approaching - approaching the area now. And both targets are - are hanging in there.

04 16 07 22 CMP Camera went just right at zero-phase. And here again, it was extremely easy to recognize the targets - this would be - really, again, a no-sweat proposition to pick the targets up. Zero-phase - really doesn't have that big an effect on - on these two targets.

04 16 08 10 CMP Okay. And now, I'll stop and rate them here; seems like a good time. I guess target A was extremely good all the way along. Target B, also, was quite easy to recognize. But here again, prim - primarily because of the - of the Sun shining on the - on the crater rim. An older, more diffuse crater would be more difficult to pick up, but with those - with those bright - bright rims - bright side to - both targets A and B, it was really no problem. Okay. And my last picture, I will give you a mark. When it goes off, it'll be a little past 12:32.

04 16 09 21 CMP And -

04 16 09 22 CMP MARK. Last picture on target 4. Camera is off.

04 16 11 11 CMP Okay. I'll get to moving here, and then I'll pick me up at - oh, maybe between 50 and 58. First frame number should be eight.

CONFIDENTIAL

04 16 13 42 CMP Okay. Just a couple of more comments while they're fresh in my mind. I think there was a big difference between the frontside and the backside passes, and that's primarily because, on the - on the front side, we're picking out craters that were out in a flat area. And they had the rim up behind them to - to guide you in on it. I think you'd - you'd use the - the large, gross features to get you pointed in the right area of the - of the mare or the flat surface, and - and then, the - the rim of the crater would - would - would show up. And you could guide in on it. Both those craters at Parry were quite fresh; they had a bright rim. The target A in the Ptolemaeus was fairly subdued - but still, yet, it did show up, and you could hold on to it right through zero-phase. So, let me see, I'd rate -

04 16 15 16 CMP I'd rate both - both targets 3 and 4 - high.

04 16 39 07 CMP A-3, C-4, B-3. A-3. C-4 - Okay, Ron. A-3, C-4, B-3, D-4.

04 16 39 57 CMP Okay. Make sure she's running.

04 16 41 40 CMP Verify ...

04 16 42 07 CMP Configure camera - the right one. ...

04 16 45 09 CMP Okay. On the zodiacal light: The - after the first 20-second frame, I got out of shut - sync on the shutter, and I fired off two more frames before I got down to - to 10 seconds. And then I went to 10 seconds and then 5 seconds, in order.

04 16 45 55 CMP And I was also a little late getting started. I started at about 6 minutes, instead of 5. And I'll get these others on time here; 8:20, we're looking for.

04 16 46 23 CMP Open.

04 16 46 36 CMP 27, 37. Okay, three - three on 10 -

04 16 46 59 CMP Okay. Two on 5.

CONFIDENTIAL

Day 5

04 16 47 08 CMP Okay. The 8:20 went just as advertised; 20, 10, and 5. So far, the only thing extra was the - one on the - first one.

04 16 47 50 CMP 16, 8, and 4 on 11:40.

04 16 48 29 CMP 11:40, 16, 8, and 4.

04 16 48 37 CMP 11:40, 16, 8, and 4.

04 16 49 37 CMP Record 11:40; 28, 29 - 16 ...

04 16 49 58 CMP Okay, I'm in sync. Okay, next one's 8.

04 16 50 09 CMP Eleven, okay, at 24.

04 16 50 21 CMP Okay, I got out of sync. I'm going to repeat the 4 on the 11:40 - plus. Okay.

04 16 50 36 CMP Okay. That's got it. That was an extra frame on the 11:40 sequence.

04 16 51 29 CMP Aaah (sigh).

04 16 53 15 CMP 13, 14, 15:00. Okay. I'm in sync; 16, 8, and 4.

04 16 53 32 CMP Okay.

04 16 53 40 CMP And there's number 4. Okay. There's two extra ones here. Let me give you another good 4.

04 16 53 53 CMP Okay. That takes care of the 15:00, with two extra shots in there.

04 16 56 12 CMP ..., 4, and 2.

04 16 56 37 CMP Okay, I'm in sync; there's the Moon. Should be in sync. Okay, I'm in sync. ... Okay. We have 8, 4, and 2.

04 16 59 34 CMP 21:40, one frame at 8.

04 17 00 17 CMP Okay. I took an extra 4 there, also. I wasn't sure whether the thruster fired.

04 17 01 30 CMP Okay, 25:00; 4, 2, and 1.

04 17 05 36 CMP I'm looking for 29:00 now.

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04 17 06 29 CMP 7, 8, 9.
 04 17 06 34 CMP 3, 4, 5, 6, 7, 8, 9, and 10.
 04 17 06 45 CMP 3, 4, 5.

TIME SKIP

04 18 41 44 CMP ... And it's not in here. And it's not in here, either. ...
 04 18 42 42 CMP 22.
 04 18 43 01 CMP ...
 04 18 45 01 CMP ... my butt out.
 04 19 34 18 CMP Houston, ... Kitty Hawk.
 04 19 52 42 CMP Okay. Can you read, Ron?
 04 20 02 44 CC And if you have a free minute, we would like some commentary on the depth of the MET tracks.
 04 20 07 38 CC Roger. Out.
 04 20 07 45 CC And 8 amperes before pressing the switch.
 04 20 16 44 CMP Well, great. Looks like we made it.
 04 20 35 34 CMP No, I didn't get that yet. Do you want to let it run on through until I come out AOS, or do you want - When do you want that terminated?
 04 20 35 49 CMP Okay.

TIME SKIP

04 21 29 07 CMP Okay. Thirty seconds, and everything looks good here.
 04 21 29 23 CMP Okay. ULLAGE is on.
 04 21 29 36 CMP And we've got -

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04 21 29 37 CMP

IGNITION. And she's steady as a rock.

04 21 29 54 CMP

And SHUTDOWN.

~~CONFIDENTIAL~~

DAY 6

05 11 55 26 CC Roger; I copied - copied all of that.

05 11 57 20 CC Roger. Serial number 1002 and 305.

05 11 58 05 CC Okay. Give me a call when you get there, and I'll start the timing.

05 11 58 16 CC Starting the clock.

05 11 59 59 CC Go ahead, Ed.

05 12 00 50 CC Okay. I got all - all readings, Ed.

05 12 00 58 CC Roger. High scale.

TIME SKIP

05 19 03 02 CMP Okay. We're getting ready to start the zero-phase observations on targets 5 and 6. We're a minute and a half past the T-start time; waiting for 5 minutes - to put on the camera.

05 19 03 25 CMP Passed over target 1.

05 19 03 36 CMP Sure is a lot of difference with this low Sun than there was yesterday. Kind of amazing about C; how - in particular, how it - You really lose it at zero-phase.

05 19 05 20 CMP Well, tell you what. At this low - Sun angle, you can see a B on target 2, but it's still - still almost unidentifiable; that's just really a tough target. A shows up real well at this low Sun angle. You'd be hard put to call which crater was B - at any Sun angle.

05 19 06 02 CMP Okay. At 04:20, turning on the DAC here shortly. Camera ...

CONFIDENTIAL

Day 6

05 19 11 13 CMP

And I lost them all - So on that one, at the switch point, I could not pick up target A at all. It was just too subdued. B was easy to pick up, and C also. C - C was - was very easy to pick up. Going through zero-phase, B was completely wiped out; A, I never did have to start with, so it was wiped out; and C - C held through zero-phase and reasonably well; but as it got further on up, it, too, got pretty well wiped out. I think it's the same bit of being on the - being on the backside. You just - The terrain is - You don't have the flat mare surface to give you the relief that - that you need to pick out - to pick out the targets. It's - what - very little contrast in albedo, and - you - you just don't have the - the ability to see the darks and lights like we did on the frontside pass yesterday. And, I guess, in summary now, for targets 3 - very easy to pick up at the time I picked them up; of course, the Sun was low on them. And I'm going to turn off this ... test lever under panel 18. Okay, I'll leave it on a little longer and debrief onto the tape. A - A, B, and C on target 3 picked up very easily. Saw them into zero-phase; surpris - B is a fairly shallow crater, but it even held up as good as C. I'd put B and C both completely wiped out at zero-phase. A held to zero-phase; but then, as it went on up, you surely couldn't have picked it up - by itself, if you didn't know the relation to some other terrain. All three of those were - Once you're well past zero-phase, it'd be a rather marginal target. And, on target 6, I never got A at all - it was already wiped out. B went real fast in zero-phase approach. C, you could still identify after zero-phase, but just because you knew it was there. And then, it got pretty well wiped out as it - as it went on

05 19 14 19 CMP

And I'm turning off the camera. It just made its last mark. I'll let it hit one more. Let it cycle one more time.

05 19 14 41 CMP

MARK. The end of the strip. Okay, Houston. How do you read Kitty Hawk?

05 19 15 11 CMP

(Whistling)

05 19 15 31 CMP Okay. Let me see if I can pick up the high gain.
05 19 15 48 CMP It ought to be getting better real fast.
05 19 15 57 CMP Okay. And stand by just 1; I'll make - I want to
make a couple of notes here. And - -

TIME SKIP

05 22 05 34 CMP ...
05 22 05 40 CDR ... ORB RATE ball.
05 22 05 44 LMP Okay. ...
05 22 05 50 CDR You got an ORB RATE ball.
05 22 05 51 LMP Okay.
05 22 06 03 LMP Yes ...
05 22 07 56 CDR He said everything's looking good, but then he
lost us.
05 22 07 58 LMP Yes ...
05 22 08 06 CDR ...
05 22 08 11 LMP Houston, Antares; ... again.
05 22 09 03 LMP ...
05 22 09 13 LMP It didn't ...
05 22 11 13 CDR Okay. ...
05 22 11 23 CDR ...
05 22 11 26 CMP Go ahead, Houston.
05 22 11 44 CMP Okay. ...? I've already ... one.
05 22 13 10 CDR Loud and clear, Houston. How me?
05 22 14 10 LMP Roger. ...

~~CONFIDENTIAL~~

05 22 14 23 LMP ...

05 22 14 36 LMP ...

05 22 14 41 CDR Okay. ...

05 22 14 57 CDR PCM, LO.

05 22 15 46 CDR ... cutoff. ...

05 22 15 51 LMP ... that supposed to be ...

05 22 15 53 CDR Is it?

05 22 15 54 LMP Yes.

05 22 16 55 LMP ...

05 22 17 05 LMP ...

05 22 17 12 CDR ...

05 22 17 16 LMP Okay. I've got ... 4 ...

05 22 22 30 LMP ... flow ...

05 22 22 35 CMP Okay, Antares. I ... maneuver.

05 22 22 40 LMP Okay, Stu.

05 22 22 59 CMP Okay.

05 22 23 17 CDR Okay. ... solution?

05 22 23 34 CDR ... degrees.

05 22 23 44 LMP ... NOUN ... need -

05 22 23 48 CDR ...

05 22 23 54 LMP Okay, you have 30. ...

05 22 24 04 LMP ... Okay, NOUN 58 ... 46 -

05 22 24 15 CDR ...

05 22 24 13 LMP 885, 287. All right.

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05 22 24 29 LMP ... 1, plus 1 ... 631. That's pretty close ...

05 22 25 00 CDR ... did you read our NOUN 81?

05 22 25 04 CMP Say again?

05 22 25 06 CDR Did you read our NOUN 81?

05 22 25 09 LMP Okay. We had 62 - plus 62 1, plus 0.1, plus 63 1, and I'll take yours.

05 22 25 21 CMP ...

05 22 25 32 LMP Okay.

05 22 25 35 CDR Getting pretty good on that sextant, huh?

05 22 25 38 CMP Yes ...

05 22 25 46 LMP That's affirm. We have VHF RANGING on A and RECEIVE on B.

05 22 25 52 CDR Do you want 59?

05 22 25 54 LMP No, I don't care.

05 22 26 05 CDR Okay. I'm going to call up 42.

05 22 26 10 LMP Pardon? Okay.

05 22 26 12 CDR Calling up 42.

05 22 26 17 LMP Okay. Our solutions are good enough. We'll go - go with your PGNS, A1.

05 22 26 25 CDR ...

05 22 26 37 LMP Stu? Stu, we're going to burn plus 62.1, plus 0.1, plus 63.1.

05 22 26 47 CMP Okay, I copy.

05 22 26 50 CDR Okay. ...

05 22 26 59 CDR ... burn attitude.

05 22 27 02 LMP Can you get the checklist while I finish targeting AGS?

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05 22 27 16 LMP Okay. I need VERB 16. ...

05 22 27 51 CDR Okay, Stu. We're in burn attitude. Looks like we're going to make the burn all right.

05 22 27 55 CMP Okay.

05 22 27 57 CDR Okay.

05 22 27 58 LMP Okay. I'm through with those. You can have them.

05 22 28 01 CDR Okay. Counting down ... check your DISPLAY/ENGINE OVERRIDE/LOGIC, closed; and DESCENT ENGINE OVERRIDE, open.

05 22 28 11 LMP Okay. What was the closed one?

05 22 28 13 CDR DISPLAY/ENGINE OVERRIDE/LOGIC.

05 22 28 15 LMP Okay, it's closed. DESCENT ENGINE OVERRIDE, open.

05 22 28 17 CDR Okay. RATE SCALE, 25.

05 22 28 21 LMP Okay. Let's get these helmets down.

05 22 28 32 CDR ... PGNS ...

05 22 28 46 LMP ...

05 22 28 51 CDR Now, mine will be okay.

05 22 28 52 LMP Yes, yours is all right.

05 22 28 58 CDR Okay. One minute ... seconds to go. You had a 400 plus 10000?

05 22 29 05 LMP 400 and plus 10000.

05 22 29 19 CDR Okay. To end ... ullage ...

05 22 29 27 LMP Okay.

05 22 29 35 LMP ... manual start ... in ... seconds.

05 22 29 39 CDR ...

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05 22 29 43 LMP ... see, you're not - you're not only arming with the abort stage; if you don't get it, go ENGINE ARM, ASCENT.

05 22 30 18 CDR Okay. ...

05 22 30 42 CDR ... set. Starting ullage. 6, 5, 4, PRO, 3, 2, 1. We have -

05 22 30 54 CDR IGNITION. ...

05 22 30 58 CDR CUT-OFF ...

05 22 30 59 LMP Man!

05 22 31 00 CDR Okay. We made the burn.

05 22 31 04 CMP Okay. Sounds like you got a good burn.

05 22 31 09 LMP Boy, that's a wild ride, Stuart.

05 22 31 13 CMP I've been told ...

05 22 31 17 CDR Yes, we're trimming now.

05 22 31 48 LMP Beautiful, Al; 0, 0, and 3. Let me write them down.

05 22 31 52 CDR Okay; 0, 0, plus 0.1.

05 22 31 54 LMP Okay, you got them; 0, 0, plus 0.1. AGS is plus 0.2, 501, minus 0 ...

05 22 32 25 CDR Okay ... reset. Now we ought to get back into AUTO TRACK.

05 22 32 38 LMP We should be in it.

05 22 32 42 CDR Okay.

05 22 32 57 CDR Radar needles are off.

05 22 33 01 LMP Say, you got a 50 18 to take you back.

05 22 33 03 CDR Okay. ...

05 22 33 16 CDR ... back in attitude ...

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05 22 33 19 LMP I just need to see the checklist. ... 1909 and 15 ...

05 22 33 32 CMP Antares, Kitty Hawk.

05 22 33 35 CDR Go ahead?

05 22 33 37 CMP Hey, I was wondering if I could get, say, 20 seconds; see if I could get the VHF locked up?

05 22 33 42 LMP Say when you need it.

05 22 33 43 CDR Give us a mark. We'll be quiet for 20 seconds.

05 22 33 46 CMP Okay, 3, 2, 1 -

05 22 33 47 CMP MARK.

05 22 34 09 CMP Okay, Ed. I got - I got a hunch that's it. We're 26 now.

05 22 34 13 LMP Right on. We say 26. That's pretty good.

05 22 34 17 CMP ...

05 22 34 20 CDR VERB 67 ...

05 22 34 28 LMP Yes, every time you get a reset, Stu, give us a yell.

05 22 34 31 CMP Okay.

05 22 34 35 LMP We won't know unless you tell us.

05 22 35 21 CDR Okay. How's your AGS doing over there?

05 22 35 23 LMP Mar, they're just staying right in there. Just hanging in pretty as can be.

05 22 35 37 CDR Say, Stu. They tell us from Houston, now, they want us to plus-X thrust anyway on the first docking attempt. You get that word from them?

05 22 35 46 CMP Say again; I missed that.

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05 22 35 48 CDR They called us from the control center a little while - well, before we left the surface, and said now, on the docking - on the normal docking, the first attempt, they want us to thrust plus-X with you anyway.

05 22 36 00 CMP Yes, that's what they said.

05 22 36 03 CDR Okay. Well, I'll thrust plus-X four jets then when you give me a contact.

05 22 36 09 CMP Okay.

05 22 36 13 CDR I'm not sure I like it, but -

05 22 36 16 CMP No, I'm not sure I will either. Why don't we go ahead and dock and see if we capture? And if not, I'll give you a GO for thrusting.

05 22 36 23 CDR I like that idea better. We'll just play it nominal first.

05 22 36 39 CDR Okay. ... 6. ... line-of-sight radar ... what it is. Line-of-sight ...

05 22 37 38 CDR You reset your ball?

05 22 37 40 LMP I haven't reset it. ...

05 22 37 42 CDR Okay, ...

05 22 37 43 LMP Now, here's a number to reset it on.

05 22 37 44 CDR Okay.

05 22 37 45 LMP 3922.

05 22 37 49 CDR Okay. What's it look like? ...?

05 22 37 51 LMP Minus 40. That's pretty damn close. If you'll change - let me give you an apogee and perigee to reset on. There's 44 1 by - by 59, so it's 44 by 60. Okay.

05 22 38 07 CDR Okay. Off and running.

05 22 39 32 CDR Ah, there's your docking light.

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05 22 39 41 LMP Yes, there he is.

05 22 39 42 CDR Tracking light, I should say. There he is.

05 22 39 47 LMP You reading - Can you see our light, Stuart?

05 22 39 52 CMP Yes.

05 22 39 54 CDR Yes, he said that solution he had was ...

05 22 39 57 LMP ...

05 22 41 52 CDR Okay. Final comp in 1 minute.

05 22 41 55 LMP ...

05 22 42 11 LMP I have an 11-foot midcourse, but I wouldn't count too much on it. It's not enough marks.

05 22 42 17 CDR We're just about right on the nominal track.

05 22 42 20 LMP Okay. That midcourse is what I initialized after TPI. They're not very good.

05 22 42 40 CMP ... ARIA ... uplink here.

05 22 42 45 LMP Yes, could be. You got a final - oh, you don't get a final comp until - -

05 22 42 52 CDR Right now.

05 22 42 53 LMP Okay.

05 22 42 59 CDR Right now.

05 22 43 12 LMP Okay, there they are; 0.9, 0.2, and 0.6 - -

05 22 43 14 CDR Okay, NOUN 81. Stu, you ready?

05 22 43 18 CMP Roger.

05 22 43 19 CDR Minus 0.9, plus 0.2, minus 0.6.

05 22 43 28 LMP Wait a minute.

05 22 43 29 CMP Minus 0.9, plus 0.2, minus 0.6.

05 22 43 32 CDR That's right, and I think we'll burn it RCS.

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05 22 43 35 CMP Okay. Mine are ...

05 22 43 42 CDR Not bad a-tall. Not bad a-tall. Everything's right direction; very close.

05 22 43 56 LMP Okay.

05 22 43 57 CDR You got them?

05 22 43 58 LMP Yes.

05 22 44 10 LMP Okay. You're in ATT HOLD, going AGS - Which one are you going to burn first? It's nearly all X right now.

05 22 44 31 CDR I wiped it out.

05 22 44 32 LMP VERB 16 NOUN 85.

05 22 44 36 CDR ...

05 22 45 10 CDR Did you write down the ...?

05 22 45 13 LMP No, I didn't, Al.

05 22 45 17 CDR ...

05 22 45 19 LMP Well, I can tell you what they are, because I - -

05 22 45 20 CDR Well, I mean for - you know - debriefing - -

05 22 45 21 LMP Yes.

05 22 45 22 CDR - - later on. Okay - -

05 22 45 24 LMP I did write them down, too.

05 22 45 28 CDR Okay, Stu, we'll do it. On time.

05 22 45 31 CMP Okay.

05 22 45 55 CDR Okay, we're burning.

05 22 46 02 CDR Burn complete. Okay. Plus 0.1 in all registers.

05 22 46 16 LMP Okay. In all axes?

05 22 46 23 CDR Right.

~~CONFIDENTIAL~~

05 22 46 28 LMP Okay. VERB 76; MODE CONTROL, AUTO.

05 22 46 32 CDR Okay, it's in AUTO.

05 22 46 37 LMP P35.

05 22 46 39 CDR We're in 35.

05 22 46 41 LMP Okay. VERB 93.

05 22 46 43 CDR Got it.

05 22 47 01 LMP ... 9.

05 22 47 38 CDR Yes, let me have that ...

05 22 47 41 LMP Okay.

05 22 47 53 LMP I want to put another film MAG on and get more of Stuart than I've got left on this one. I've got a batch of empty MAGs.

05 22 48 08 LMP 34.

05 22 48 20 CDR We're right on the nominal. Right on the nominal plot.

05 22 48 50 CMP Man, I tell you, your lights are really bright from out here.

05 22 48 54 CDR Glad you like it. Hey, you're in sunlight, huh? Yes, there he is.

05 22 49 37 CDR So are we in sunlight.

05 22 49 43 CMP Mar., that ...

05 22 49 46 CDR (Laughter) You get a little star down here?

05 22 50 20 LMP Okay, dock. T8.

05 22 50 44 LMP Okay; T8, 250 at 10.

05 22 50 52 CDR You got to focus it.

05 22 50 55 LMP Huh?

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05 22 50 56 CDR It says here you got to focus it. They don't tell you what the focus ...

05 22 50 59 LMP Well, anything on this one over - -

05 22 51 02 CDR ... feet?

05 22 51 04 LMP - - 6 feet's infinity.

05 22 51 07 CDR Okay.

05 22 51 13 LMP ... 50 at 10.

05 22 51 39 CDR Man, I'm glad we're not going for a long rendezvous today.

05 22 51 42 LMP Me, too.

05 22 52 07 LMP Stu, could you see us without the light? I'll turn it off.

05 22 52 10 CMP That's affirmative. I can see you fine.

05 22 52 13 LMP Okay. It's off. Give me another camera setting, Al. For this one, it's - -

05 22 52 20 CDR Okay. ... 50th, f/11.

05 22 52 26 LMP Okay. 250th. Okay, whatever the distance is -

05 22 52 34 CDR Take five shots, it says.

05 22 52 37 LMP Okay, I got ...

05 22 52 40 CDR Okay (yawning). You can start taking shots now, if you want.

05 22 52 42 LMP Pardon?

05 22 52 44 CDR Get - Venus up there.

05 22 52 53 LMP Now, if I can remember where I put my camera bracket.

05 22 52 59 CDR You had then down there.

05 22 53 04 LMP ... goodie I forgot.

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05 22 53 05 CDR Yes, I stuck that one in there while you were packing up.

05 22 53 30 CMP Boy, there's just hardly any ...

05 22 53 35 CDR Yes, I noticed that, Stu. It's the - seems to be right on the ball all the way. Right on the ball. The old bellyband.

05 22 54 26 LMP You got time to check and see if that angle bracket is over in the regular stowage? I thought I put it somewhere else to get it out of your way, and I can't remember where now.

05 22 54 47 CDR Here it is.

05 22 54 50 LMP Good show.

05 22 55 17 CDR Climbing up the hill.

05 22 55 22 LMP ... number 2 midcourse?

05 22 55 23 CDR Yes. We'll have comp in ...

05 22 55 32 CDR Nine thou and - -

05 22 55 34 CMP I tell you, now that is a wild sight watching ... intersect the terminator ...

05 22 55 46 LMP Twenty-nine thou ... Okay, we're bellying out just a little bit. Say again, Stu?

05 22 56 01 CMP I was saying that's a wild sight, looking down on you with the - just now starting to cross the terminator.

05 22 56 09 CDR Yes, I'll bet it is.

05 22 56 21 CDR I'll bet it is.

05 22 56 46 CMP Hey, you know, I saw the - I could see the ALSEP ... over ...

05 22 56 51 CDR That's what they said. Ron was telling us that. Man!

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05 22 56 58 CMP I got a real good track on you on my pass yesterday, the shadow. It really showed up, man. Big long shadow coming out the LM.

05 22 57 08 CDR Great. You think we were pretty close to the landing site?

05 22 57 16 CMP I'd say you were.

05 22 57 54 CDR Okay. We're in final comp now for ...

05 22 58 25 CDR Okay, NOUN 81, Stu. Minus 0.1, minus 0.2, minus 1.4.

05 22 58 35 CMP Okay. I copy minus 0.1, minus 0.2, minus ...

05 22 58 39 LMP ...

05 22 58 43 CDR ...?

05 22 58 44 LMP Yes.

05 22 58 55 CMP Okay, mine is plus 0.6, minus 0.2 ...

05 22 59 07 CDR Okay, very good.

05 22 59 24 CDR I guess we'll burn it.

05 22 59 26 LMP Okay.

05 22 59 30 CDR If I can still help you over here.

05 23 00 35 CDR Okay. We'll burn Z first. As a matter of fact, that's all we've got left.

05 23 00 43 CMP Okay. As a matter of fact, that's all we've got left.

05 23 01 09 LMP Okay; trim to lll?

05 23 01 13 CDR Plus lll. Okay. Burn's complete, Stu.

05 23 01 17 CMP Okay.

05 23 01 22 CDR Okay, put me back on the checklist now.

05 23 01 25 LMP Okay. Go to P00.

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05 23 01 33 CDR Okay.

05 23 01 36 LMP VERB 48, 11 - Oh, you had to change that. Your VERB 48, 13002.

05 23 01 43 CDR Yes, well, we're supposed to load four jets, you see, in case we have to -

05 23 01 47 LMP Yes. Well, do you want to put that in now or wait?

05 23 01 49 CDR Yes, might as well.

05 23 01 50 LMP Okay, 13002.

05 23 02 05 LMP Okay. DAP's changed. Go PL7.

05 23 02 13 CDR We read you loud and clear, Houston.

05 23 02 21 CDR Well, things just about as nominal as they could be. We had good TPI and midcourses of around 1.9 and 1.1 feet per second, DELTA-V total. Give you the exact numbers if you want them, but everything's just about nominal.

05 23 02 42 LMP And you're locked up on the steerable, Houston.

05 23 02 47 CDR Okay, Ed'll give them to you.

05 23 02 48 LMP Stand by.

05 23 02 50 CDR Ed'll give them to you.

05 23 02 53 LMP Okay. The numbers for TPI: NOUN 81, plus 62.1, plus 0.1, plus 63.1; burned on time; and nulled PGNS to 00 plus 0.1.

05 23 03 19 LMP Okay.

05 23 03 20 CDR Okay, you got NOUN - -

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DAY 7

06 04 08 37 CMP Roger, Gordon.
06 04 08 46 CMP ...
06 04 09 39 CMP Roger, Gordon.
06 04 15 36 LMP ...
06 04 16 15 CMP ...
06 04 19 16 CDR ...
06 04 25 04 CMP ...
06 04 34 03 CMP Your problem's loud and clear, Ed.
06 04 35 40 CMP Normal, one-half.
06 04 35 52 CMP ...
06 04 36 03 CMP Okay ...
06 04 36 30 CMP Not at all, really.
06 04 38 26 SC ...
06 04 39 03 CDR ... point zero ...
06 04 42 54 CMP Oh, no.
06 04 43 05 SC ...
06 04 43 25 CMP Yes. ...
06 04 43 35 CMP Well ...
06 04 43 57 CMP No. No, I didn't feel that one.
06 04 44 10 CMP And we want ...
06 04 44 29 CMP ...
06 04 44 39 CMP ...
06 04 44 59 CMP ...

06 04 45 08 CMP You know ...
06 04 45 18 CMP You know ...
06 04 45 56 CMP I know.
06 04 46 11 LMP Oh, yes.
06 04 46 12 CMP Okay, we're ...

TIME SKIP

06 18 48 08 LMP Houston, Apollo 14.

TIME SKIP

06 20 49 07 LMP Roger. That's what I understand as a normal acquisition, but I - I thought I heard the word REACQ a couple of times, implying a position of the antenna, and I was confused on that one.
06 20 49 25 LMP Okay, Houston.

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DAY 8

07 02 34 16 LMP Okay.

07 02 34 40 LMP Houston, 14.

07 02 34 46 LMP Okay. It seems to have popped right up very nicely this time.

07 02 34 54 LMP That's affirm.

07 02 35 01 LMP Okay.

07 02 35 12 CDR Ed, whre's a pair of scissors? Never mind.

TIME SKIP

07 18 46 28 LMP Houston.

07 18 46 39 SC ...

07 18 46 46 CDR Okay.

07 18 48 37 LMP ...?

07 18 48 39 CMP ...

07 18 48 44 LMP Well, don't do it now. Move on.

07 18 48 57 LMP ... let me do it.

07 18 55 07 LMP Very good.

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DAY 9

08 23 37 39 CDR Don't see any horizon at all, huh?

08 23 37 40 CMP Not yet, no.

08 23 37 41 CDR Probably too much light in here. Why don't you flip your floods off and see if you can see a dark horizon.

08 23 37 48 CMP The Moon is awful bright. I sure don't. All I see is a -

08 23 38 04 LMP In other words, it must be shifting. Let's see, we've got - on the tape recorder - we have 30 minutes of high-bit-rate recording, don't we?

08 23 38 24 CMP 30 minutes? Yes. There's a decal down there that tells you that. You might verify. I think it's 30 minutes for 4 hours or something.

08 23 38 32 LMP I thought there was, too, but I don't see it.

08 23 38 35 CMP Right by the HIGH switch? I saw that somewhere ... - -

08 23 38 39 LMP That's right. Right, 30 minutes in 2 hours. Okay, we've got 10 minutes to interface and 13 minutes, so with 23, we've got plenty of high-bit-rate time.

08 23 39 05 CDR Houston, 14.

08 23 39 18 LMP Okay, Stu, you - okay, there's the Moon. I've got the Moon in 2. Moonset is 25:15.

08 23 39 30 CDR Houston, Apollo 14.

08 23 39 45 CDR Well, I got signal strength.

08 23 39 46 LMP Yes. We're on the right antennas. Everything looks good now.

08 23 39 58 CDR Hello, Houston; Apollo 14.

08 23 40 28 CMP There's the horizon.

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08 23 40 29 CDR Finally found one, huh?

08 23 40 30 CMP Yes.

08 23 40 35 LMP Houston, Apollo 14. Do you read?

08 23 40 41 CC Apollo 14, this is Houston. Over.

08 23 40 43 LMP Okay, Bruce, we have you now, loud and clear.

08 23 40 48 CDR Okay, as we reported, we got a good separation; we're back in plane; and we're following the horizon on down. Yes, there it is. Look at the airglow. No. Hell, that's -

08 23 41 07 LMP Yes, there's the horizon.

08 23 41 08 CDR Yes. It's a good solid horizon. You really don't see any airglow.

08 23 41 13 LMP Not from the dark side.

08 23 41 17 CC Apollo 14, Apollo 14; this is Houston. Say again? You're very weak. Over.

08 23 41 21 LMP I'll get it. Houston - -

08 23 41 22 CDR Okay, Houston. We have had good separation; we're back in plane, are following the horizon down. Over.

08 23 41 30 CC Roger, we copy you now, loud and clear. And you're looking very good from down here, 14.

08 23 41 42 CDR Okay; everything's fine up here.

08 23 41 49 LMP Boy, I hope that Moon stays in the window here, so we get the picture.

08 23 41 53 CDR Supposed to be set on the left-hand side, isn't it?

08 23 41 55 LMP Yes. And it's almost sitting out of my window.

08 23 41 56 CDF I got it.

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08 23 41 57 LMP Yes, but it's - My window's the one that's got the camera in it.

08 23 42 00 CDR Oh, you want it then.

08 23 42 01 CMP We want to try to get a picture of the Moon sitting there. We show -

08 23 42 05 LMP If you could yaw to about 5 degrees -

08 23 42 06 CDR Give it to me. Give it to me. I'll do it hand-held, if you want.

08 23 42 10 LMP No, hell, you could - .05g's get you right after that. Let's don't - -

08 23 42 12 CMP Two minutes.

08 23 42 13 LMP Yes, let's don't take the camera out of the bracket. Might not get it back in time.

08 23 42 16 CDR All right.

08 23 42 20 LMP I think it's going to be close enough.

08 23 42 23 CDR Okay, what's next on the checklist?

08 23 42 25 LMP That's it, .05g's next - RRT is next, rather.

08 23 42 30 CMP Okay, Al, here we need - -

08 23 42 32 CDR Some more light.

08 23 42 33 CMP Yes. Thank you. Beautiful. We need CMC, RATE CCMMAND, in case we go SCS; and, other than that, she looks good.

08 23 42 50 CDR Need EMS ROLL and .05g, also.

08 23 42 53 CMP That's right, and we need this to back up at 32.

08 23 42 58 CDR If it doesn't work.

08 23 42 59 CMP If it doesn't work. No matter what that reads, at 32, this switch goes off.

08 23 43 06 CDR 32?

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08 23 43 08 CMP At 32, right here.

08 23 43 10 CDR Oh. That's true. If you don't have your .05g light.

08 23 43 18 CMP Yes. If - if it didn't start itself. Damn, that Moon's -

08 23 43 34 CDR It's really hard to see it.

08 23 43 35 CMP Yes. I think I'll put it back up a little bit. Oh, there's the - the terminator coming.

08 23 43 41 CDR Yes, if you roll a little bit, Ed'll get it.

08 23 43 46 LMP Yes. Yes. Okay, it's coming in nicely now.

08 23 43 56 CC Apollo 14, this is Houston - -

08 23 43 57 LMP Great, great.

08 23 43 58 CC - - We show you with 98.4 amp-hours left on the water and 56 hours endurance. Over.

08 23 44 05 CDR Okay; 98.4 and 56. Thank you.

08 23 44 09 LMP That's - that's great - -

08 23 44 10 CC Roger.

08 23 44 12 LMP Got a good view.

08 23 44 13 CMP Okay. There's some airglow.

08 23 44 17 LMP Yes. It's starting to glow. We got a - Oh! Man, oh man; you can see it!

08 23 44 21 CDR Well, we better run the camera.

08 23 44 23 LMP No, I don't want to waste film yet. Wait until it starts to set.

08 23 44 27 CDR Okay.

08 23 44 28 CMP Well, let me see. You've got -

08 23 44 30 LMP We've got a minute - I've got 45 seconds.

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08 23 44 34 CMP Oh, give it 45 seconds. Now, turn her on.

08 23 44 36 LMP No, just a little more; I haven't got that much film.

08 23 44 37 CDR Oh, turn it on, for Christ's sake. Run it at - -

08 23 44 41 LMP I've got my film budgeted.

08 23 44 43 CDR Run at slower speed, for Christ's sake. Then you could - do something.

08 23 44 48 CMP Hey, you've only got 30 seconds (laughter).

08 23 44 50 SC (Sound of camera running)

08 23 44 51 LMP You bastards are running my film out before I get the chutes.

08 23 44 54 CMP Oh, I'd rather have that than the chutes.

08 23 44 55 LMP Oh, man that sure is pretty. Back home again. Keep it in the window. You're letting it get too high on me - -

08 23 45 01 CMP All right.

08 23 45 02 LMP - - I mean, too far down.

08 23 45 04 CDR There she goes. The real - -

08 23 45 08 CMP And moonset, Houston.

08 23 45 10 CDR The real moonglow.

08 23 45 12 CC Roger, Stu.

08 23 45 13 SC (Camera stops)

08 23 45 14 CDR Yes, that was the real moonglow.

08 23 45 16 LMP Okay.

08 23 45 17 CC Right about on time.

08 23 45 18 LMP Right on time. About 2 seconds early.

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08 23 45 22 CDR Okay. Well, we ought to get back in some kind of attitude here.

08 23 45 29 LMP Okay. Okay, I'm going - be on my cards here in just a minute. You'll be on your own.

08 23 45 38 CMP We're at 154, pitch.

08 23 45 42 LMP Okay, 154 is your attitude. We're waiting for RRT, which is exactly 2 minutes from now.

08 23 45 51 CMP Stu needle looks like she's taking a notion to come off the peg.

08 23 45 58 CDR The which needle?

08 23 45 59 CMP The pitch steering needle.

08 23 46 01 CDR Oh, the steering. You said the Stu needle, and I wondered what the hell - which needle you'd adopted.

08 23 46 08 LMP Okay, Stu, you're going to have RATE COMMAND, CMC, AUTO at .05g, right?

08 23 46 13 CMP Okay, yes. Yes, well, CMC, anyway. If you want AUTO, I'll put her there now.

08 23 46 16 LMP Okay.

08 23 46 18 CMP That should be taken out of the checklist. But that fills all the squares.

08 23 46 23 LMP Yes. You can have AUTO whether you need it or not, huh?

08 23 46 29 CMP That's right. Entry DAP does not look at the MODE switch.

08 23 46 32 CDR Oh man, are we coming down!

08 23 46 33 CC Apollo 14, this is Houston through AFIA 2. How do you read? Over.

08 23 46 35 CDR Loud and clear, Houston.

08 23 46 41 CC Roger. Reading you the same, 14.

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08 23 46 44 CDR Okay. We're standing by for RRT.

08 23 46 53 CMP And our thanks to the ARIA troops for the memento they sent before launch.

08 23 47 00 CC Okay. I'll pass it on to the rest of them. I'm sure some of them are monitoring the loop.

08 23 47 06 CDR Okay.

08 23 47 07 LMP Okay; 47.

08 23 47 14 CDR Needles converging. Nicely. Nicely.

08 23 47 27 SC (Scound of camera running)

08 23 47 28 LMP Okay, there's 20 seconds. RRT.

08 23 47 35 CMP See you're - now, see you're starting it here a good minute before anything happens.

08 23 47 38 LMP No. Well, I'll shut it off a little bit more.

08 23 47 39 SC (Camera stops)

08 23 47 41 CMP When you had - when you had something good going -

08 23 47 43 LMP Yes, but I've got to get my hands down right now. 5, 6, 7 - RRT?

08 23 47 48 CMP RRT.

08 23 47 49 CDR Okay.

08 23 47 50 CMP About 17, we should start picking up some g's. Okay, troops, we're on our way.

08 23 47 55 CDR Here we go. On the way.

08 23 47 56 CC Okay, Apollo 14. It's about 8 seconds to beginning of blackout.

08 23 48 00 CMP Here she comes.

08 23 48 01 CC We'll talk to you when you come out the other side.

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08 23 48 02 CDR Okay, Bruce.

08 23 48 03 CMP Here she comes.

08 23 48 04 CDR Okay. Sounds good.

08 23 48 05 CMP Okay. We're CMC.

08 23 48 06 CDR Okay. ... - -

08 23 48 07 LMP And stand by.

08 23 48 08 CDR - - zero g.

08 23 48 13 CMP Okay. We're CMC CONTROL.

08 23 48 15 LMP MARK. .05g.

08 23 48 16 CDR MARK. .05g.

08 23 48 18 CMP 32. Okay, I started it.

08 23 48 20 CDR You got the light?

08 23 48 23 CMP No. I started it, though.

08 23 48 26 CDR EMS, .05g, ROLL.

08 23 48 28 CMP I've got them.

08 23 48 31 CDR Okay, you got the .05g, EMS ROLL switch?

08 23 48 34 CMP That's right. CMC in RATE COMMAND. Okay - -

08 23 48 37 CDR Okay.

08 23 48 38 CMP - - passing one g.

08 23 48 39 CDR Okay, 1.4.

08 23 48 40 CMP Okay, passing 2g's.

08 23 48 43 CDR 2.

08 23 48 45 CMP 2.4.

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08 23 48 48 CDR 2.8.
08 23 48 49 CMP Passing 3g's.
08 23 48 50 CDR 3.2.
08 23 48 51 CMP Passing 4g's.
08 23 48 52 CDR 3.7. Locks good; 4.2.
08 23 48 53 CMP Passing 5g's.
08 23 48 54 CDR 4.7, 5.2, 5 - 5.5. Okay. ... 5.8.
08 23 49 03 CMP Locking good.
08 23 49 04 CDR 6.3.
08 23 49 05 CMP Okay.
08 23 49 06 CDR 6.6.
08 23 49 07 CMP Very good.
08 23 49 08 CDR 6.7.
08 23 49 09 CMP It's stiff.
08 23 49 10 LMP That should be it.
08 23 49 11 CDR 6.75.
08 23 49 12 CMP Okay.
08 23 49 13 CDR Coming back off; 6.7.
08 23 49 14 CMP Okay. Watch for a roll.
08 23 49 15 LMP Okay.
08 23 49 16 CDR Now, we're starting to roll.
08 23 49 17 CMP It's commanding a roll.
08 23 49 18 CDR Starting to roll.
08 23 49 20 CMP Okay; g's are coming off. Peak g checks well.

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08 23 49 24 CDR Yes. Entered 1 - 180.

08 23 49 27 CMP Okay, we're at 180. It's falling.

08 23 49 33 CDR Very good; 4g. How do you look?

08 23 49 34 CMP I'm steady; 4.

08 23 49 35 CDR Beautiful. Beautiful.

08 23 49 37 CMP Steady; 4g.

08 23 49 38 CDR Beautiful.

08 23 49 39 CMP On two counts.

08 23 49 42 CDR Okay; 140, it was. Plus 140. Plus 96.

08 23 49 51 CMP Good show.

08 23 49 52 CDR Plus zero.

08 23 49 53 CMP Good show. Good roll; we've passed V_{CIRC}.

08 23 49 56 CDR Okay. We want zero roll. Zero roll.

08 23 50 05 CMP Man, it sure dug in there.

08 23 50 07 CDR Yes.

08 23 50 08 CMP Come on. Get past - It's got to stay up or we're going to be short.

08 23 50 13 CDR Zero roll.

08 23 50 18 CMP It's getting its potential back.

08 23 50 19 CDR Okay.

08 23 50 21 CMP Let's check velocity, if you can reach it.

08 23 50 23 CDR Okay.

08 23 50 24 CMP NOUN - -

08 23 50 25 CDR VERB 60 NOUN 74 ENTER. 21340.

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08 23 50 29 CMP Okay. I'll give you - -

08 23 50 30 CDR 21140. Give me a mark.

08 23 50 32 CMP Hey, you give me a mark on - because yours is computing.

08 23 50 37 CDR Okay, 26, 24.

08 23 50 39 CMP Okay, we're good. You can go back - -

08 23 50 40 CDR 23.

08 23 50 41 CMP Go back to normal display. It's commanding 60 degrees.

08 23 50 45 CDR Okay, 60 degrees (cough).

08 23 50 46 CMP It's got 60.

08 23 50 47 CDR Okay. Did CI look good?

08 23 50 49 CMP Yes. CI was exact.

08 23 50 50 CDR Okay. Great. 70 by 72.

08 23 50 52 CMP Okay. It's got its potential back now.

08 23 50 55 CDR Plus 75.

08 23 50 56 CMP Okay.

08 23 50 57 CDR Plus 76.

08 23 50 58 CMP Okay.

08 23 51 00 CDR Okay, over the top.

08 23 51 01 CMP It's coming over.

08 23 51 02 CDR Minus 80. Minus 80, 83.

08 23 51 09 CMP It's falling.

08 23 51 10 CDR Minus 90.

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08 23 51 21 CDR Minus 88.

08 23 51 22 LMP Okay, we should be in the blackout. Here's 335.

08 23 51 25 CDR Okay.

08 23 51 27 LMP We still don't have signal strength.

08 23 51 30 CMP Okay, we're still on - about 400 on the EMS scroll.

08 23 51 34 CDR Okay. Minus 80. Minus 78.

08 23 51 39 CMP And it's flying it. Okay, potential's bleeding off.

08 23 51 41 CDR Minus 66.

08 23 51 42 CMP Okay, that's good. It's bringing it up.

08 23 51 44 CDR Minus 64.

08 23 51 46 CMP Okay. We're still on the dot. We're probably going to go back in for about 3g's here - -

08 23 51 53 CDR Minus 58. Minus 49.

08 23 51 58 CMP Okay.

08 23 51 59 CDR Minus 38. Houston, Apollo 14. How do you read?

08 23 52 05 LMP No signal strength, Al.

08 23 52 08 CDR Okay.

08 23 52 09 CMP Okay, the EMS is minus 50 - -

08 23 52 11 LMP It's starting to come in now.

08 23 52 12 CMP It's agreeing well. Past 200. It should be leveling it off, and it is.

08 23 52 19 CDR Minus 50.

08 23 52 20 CMP Dug in just a little bit.

08 23 52 21 CDR Yes.

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08 23 52 23 CMP Going right at 3g's.

08 23 52 25 CDR Aah. That's good.

08 23 52 26 CMP That's only a g and a half.

08 23 52 28 CDR Minus 21. ...

08 23 52 29 LMP Houston, Apollo 14. How do you read?

08 23 52 31 CMP Okay, the range potential's beautiful. It's really doing a great job.

08 23 52 34 CDR Minus 42. Minus 15. Just a little glitch.

08 23 52 42 LMP Houston, 14. How do you read?

08 23 52 44 CDR Cross range and down range.

08 23 52 45 CC Okay, 14. You're coming in loud *** ARIA 3. How did it go?

08 23 52 51 LMP Oh, very good. We're pressing right on down.

08 23 52 55 CMP Things are looking good, Bruce. EMS, CMC checking real well.

08 23 52 58 CC Good show, Stu. On television, looks like a beautiful ***

08 23 53 03 CDR Okay. Minus 48. How do we stand on steam PRESS?

08 23 53 08 LMP Just a minute, I can't get my watch.

08 23 53 11 CDR Minus 50 - You got so many watches, you can't pull your arm up. Minus 60.

08 23 53 15 LMP About a minute to 90K.

08 23 53 18 CDR Minus 65. 63. Okay.

08 23 53 25 CC 14, Houston. Samca Rescue 1 has S-band lock with you. Over.

08 23 53 33 LMP Roger. Thank you.

08 23 53 36 CMP Okay.

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08 23 53 37 CDR Okay, over the top. Minus -
08 23 53 38 CMP ...
08 23 53 39 CDR Plus 60.
08 23 53 41 CMP Okay.
08 23 53 42 CDR Plus 62.
08 23 53 46 LMP We estimate 30 seconds from 90K, Bruce.
08 23 53 50 CMP Okay. We're passing 50.
08 23 53 54 CDR Okay. Plus 76. Cross range and down range are hanging right in there. Burn is 1.0 and plus 145.
08 23 54 04 CMP Okay. The EMS checks real well with - -
08 23 54 06 CDR Okay.
08 23 54 07 CMP - - what it's doing. It says it's going to head us to target.
08 23 54 12 CDR Okay.
08 23 54 14 CC Okay; 6 plus 28, 14.
08 23 54 18 LMP Okay. No steam PRESS pegged yet.
08 23 54 21 CMP How's ring 1 doing? It's looking good.
08 23 54 24 CDR Minus 82.
08 23 54 25 CMP It's there.
08 23 54 28 CDR Minus 80. Minus 67; starting back.
08 23 54 37 CDR There she comes.
08 23 54 38 LMP Steam PRESS starting up.
08 23 54 39 CDR There she comes.
08 23 54 41 LMP I got it.
08 23 54 42 CDR Okay. Minus 62.

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08 23 54 46 CMP EMS is saying an overshoot.
08 23 54 47 CDR Minus 60.
08 23 54 49 LMP MARK; 90K.
08 23 54 50 CDR Okay.
08 23 54 51 LMP Steam PRESS pegged; 90K.
08 23 54 53 CMP EMS says we're going to have a slight overshoot.
08 23 54 56 CDR Okay, over the top; 72.
08 23 54 57 CMP Okay.
08 23 55 00 CDR Okay, and NOUN 67, I read 2704, 17269; 2704, 17269.
08 23 55 12 CMP Altimeter's off the peg; 60 grand.
08 23 55 14 LMP Okay.
08 23 55 15 CC Okay.
08 23 55 16 LMP I concur.
08 23 55 17 CC We copy that, 14. You're looking real good.
08 23 55 18 CDR And the altimeter's off the peg.
08 23 55 20 CMP Okay. Passing 50K, Bruce.
08 23 55 23 LMP Okay, CABIN PRESSURE - -
08 23 55 24 CC Roger. Passing 50.
08 23 55 25 LMP - - BOOST/ENTRY.
08 23 55 26 CMP Okay. Pyro's are going armed. BOOST/ENTRY?
08 23 55 28 LMP BOOST/ENTRY. PYROs, ARM.
08 23 55 30 CMP Okay, there's BOOST/ENTRY and the pyro's are armed.
08 23 55 33 LMP Okay, standing by for -

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08 23 55 35 LMP 30K.

08 23 55 36 CMP Okay. We passed - -

08 23 55 37 LMP Get me stable at 40.

08 23 55 38 CMP We're passing 40.

08 23 55 39 CDR Yes. We're stable.

08 23 55 40 LMP Okay. Call 30, then.

08 23 55 43 CMP All right.

08 23 55 44 CDR It's still steady as a rock -

08 23 55 46 CMP Okay. Pyro's are armed. We are BOOST/ENTRY.
Okay, about 32.

08 23 55 52 LMP Okay, I have you a little earlier - higher than
that.

08 23 55 54 CMP Okay. There's 30,000.

08 23 55 56 LMP ELS LOGIC, on.

08 23 55 57 CMP ELS LOGIC.

08 23 55 58 LMP ELS, AUTO.

08 23 55 59 CMP ELS, AUTO. I verify them both. Stand by for the
drogues.

08 23 56 01 CDR Stand by for the drogues.

08 23 56 02 LMP All right.

08 23 56 03 CDR Stand by for apex cover.

08 23 56 04 CMP Yes, apex cover.

08 23 56 07 CDR/CMP There it goes!

08 23 56 09 LMP There's the drogue.

08 23 56 10 CDR There goes the drogue.

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08 23 56 11 CMP And there goes the drogue.

08 23 56 12 LMP Drogues are out.

08 23 56 13 CDR Hey, beautiful.

08 23 56 19 LMP Thank you, Bruce.

08 23 56 20 CDR Nice going, Bruce.

08 23 56 21 LMP Real fine job.

08 23 56 23 CMP Okay. What's the checklist say?

08 23 56 27 CDR Ed, what's the checklist say?

08 23 56 28 LMP Okay, we're just waiting for mains. Stand by.
Cabin pressure's going up. Waiting for mains at
10K.

08 23 56 36 CDR All righty.

08 23 56 37 CMP Okay, you're passing 14; 13.

08 23 56 44 LMP I'm watching your pressure. It's confirming.
Cabin pressure's confirming.

08 23 56 49 CMP Passing 12.

08 23 56 50 CDR O₂ FLOW HI. Ignore it.

08 23 56 52 CMP No sweat.

08 23 56 54 LMP Okay, we're about 12,000.

08 23 56 55 CMP We're passing 11.

08 23 56 58 CMP And there go the drogues. And the mains are out
free. Oh, we got all three.

08 23 57 02 CDR Three.

08 23 57 03 CDR/LMP Got all three.

08 23 57 04 CDR They look great (laughter).

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08 23 57 05 CMP We got three beauties.

08 23 57 06 LMP They look great!

08 23 57 07 CMP They're dereefed.

08 23 57 09 LMP Dereefed and - Oh, boy! That's marvelous.

08 23 57 12 CMP Okay, we got three good ones. What do you think of that?

08 23 57 13 CDR/CMP/ Three.
LMP

08 23 57 14 CMP Aah, look at that - Beautiful! Okay, stay on the checklist. We're passing 8.

08 23 57 17 LMP Try to get rid of this camera.

08 23 57 21 CDR Okay.

08 23 57 23 LMP Okay.

08 23 57 25 CMP Beautiful.

08 23 57 26 LMP VHF antenna, recovery. Okay.

08 23 57 32 CMP Okay EMS is OFF.

08 23 57 34 LMP VHF A, SIMPLEX.

08 23 57 36 CDR Roger, Fredo.

08 23 57 37 CMP Okay. SURGE TANK, OFF.

08 23 57 39 R Apollo 14, Apollo 14; this is Recovery, Recovery. Over.

08 23 57 42 CDR I got it.

08 23 57 43 LMP REPRESS PACKAGE, OFF.

08 23 57 44 CDR Apollo 14, Recovery. Reading you loud and clear.

08 23 57 46 CMP REPRESS PACKAGE is OFF.

08 23 57 47 LMP ...

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08 23 57 48 CMP I've done that.

08 23 57 49 LMP DIRECT C₂ valve, OPEN.

08 23 57 50 CMP Okay. DIRECT C₂ valve coming OPEN.

08 23 57 53 LMP CABIN PRESS, CLOSE.

08 23 57 55 CDR Reading you loud and clear, Recovery.

08 23 57 57 CMP Okay. CABIN - CABIN PRESS, CLOSE. Okay.

08 23 58 02 R Apollo 14, Apollo 14. This is Recovery, Recovery, Recovery. We hold you visually. Reactivate recovery beacon. Over.

08 23 58 12 CMP Okay. Press ahead.

08 23 58 13 CDR Roger.

08 23 58 14 LMP Okay. We have COMMAND MODULE RCS LOGIC ... and CABIN PRESS, CLOSED. You got that?

08 23 58 18 CMP Yes.

08 23 58 19 LMP COMMAND MODULE RCS LOGIC on.

08 23 58 21 CMP Okay.

08 23 58 22 LMP COMMAND MODULE PROPELLANT, DUMP.

08 23 58 24 CMP Okay. ...

08 23 58 27 NEW Recovery, New Orleans. Request astronaut voice report from Apollo 14. Over.

08 23 58 33 R Roger. Wait 1. Apollo 14, Apollo 14; this is Recovery. Over.

08 23 58 38 CMP Hey, Al?

08 23 58 40 CDR Yes.

08 23 58 42 P-1 New Orleans, Photo. Photo is about a mile short. All three chutes look good. Appear to be dereefed.

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08 23 58 48 NEW Photo, Roger.

08 23 58 54 R Photo, this is Recovery. Have you heard any voice transmission?

08 23 58 58 P-1 Negative, negative. Apollo 14, Apollo 14, Photo. Over.

08 23 59 00 CMP ...

08 23 59 03 CDR What?

08 23 59 05 P-1 No joy.

08 23 59 07 NEW Roger. Switching to secondary.

08 23 59 08 P-1 Roger. I'll remain there, too.

08 23 59 11 NEW Apollo 14, New Orleans. Over.

08 23 59 20 R Apollo 14, this is Recovery. Over.

08 23 59 30 LMP Okay.

08 23 59 31 CMP We're back. Four thousand. Plenty of time. ...

08 23 59 33 CDR Okay. Purge.

08 23 59 34 NEW Apollo 14, Apollo 14, New Orleans. Over.

08 23 59 36 CMP Okay.

08 23 59 37 CDR I read you loud and clear, New Orleans.

08 23 59 38 NEW Roger. Request your report.

08 23 59 42 CDR Say again, please.

08 23 59 44 P-1 New Orleans, Photo. Apparently dumping RCS at this time.

08 23 59 50 NEW Roger, Photo.

08 23 59 51 CMP Give me the checklist, Ed.

08 23 59 52 LMP Okay. ... complete.

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08 23 59 53 NEW Apollo 14, New Orleans. Request crew status and voice report. Over.

08 23 59 57 CMP Okay.

08 23 59 58 LMP Let's get the ... on.

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DAY 10

09 00 00 05 LMP We're right on schedule. ... to 3000.

09 00 00 12 P-1 New Orleans, Photo on station. Three good chutes
- -

09 00 00 14 LMP ... COMMAND MCDULE RCS AUTO to OFF.

09 00 00 15 P-1 - - Apparently has completed dumping.

09 00 00 19 CMP Okay.

09 00 00 21 NEW Photo, Roger.

09 00 00 22 P-1 And my bearing, New Orleans, 148 radio at 4 and
a half.

09 00 00 27 NEW Roger. We hold you on radar.

09 00 00 29 P-1 Roger. Out.

09 00 00 31 NEW Apollo 14, Apollo 14, New Orleans. Over.

09 00 00 35 CDR This is 14. Read you loud and clear.

09 00 00 37 NEW Roger. Request crew status and position.

09 00 00 41 CDR Okay. The crew is fine, and we have completed
the dump and the purge. We're on the checklist,
and everybody's in good shape.

09 00 00 50 NEW Roger. Request position.

09 00 00 51 CMP Shut the freak up.

09 00 00 55 CDR Oh, we ...

09 00 00 56 LMP Yes.

09 00 00 57 CDR Okay. ...

09 00 00 58 LMP Okay. You're okay to go ... cabin pressure ...

09 00 01 06 NEW Apollo 14, New Orleans. Request computer read-out.

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09 00 01 09 CDR Okay. I give you a 2701 and 17266. 2701, 17266.

09 00 01 16 NEW Roger. Copy.

09 00 01 17 P-1 And passing a thousand feet.

09 00 01 20 NEW Okay.

09 00 01 21 CMP Roger, we're through a thousand.

09 00 01 23 NEW Roger.

09 00 01 24 CMP Okay, we're through a thousand, Ed. CABIN PRESS, CLOSED.

09 00 01 27 LMP Okay. They're both CLOSED. MAIN BUS TIES coming OFF.

09 00 01 30 CMP Okay, passing 600 feet.

09 00 01 32 R ... approximately one-half mile.

09 00 01 33 CMP Stand by for a shock; 500 feet, crew.

09 00 01 37 CDR ...

09 00 01 38 LMP Okay.

09 00 01 39 P-1 Stand by for splash on third mark.

09 00 01 42 CMP Okay. I got ... 100 feet. I show a hundred feet.

09 00 01 49 CDR 100 -

09 00 01 50 P-1 Mark. Mark.

09 00 01 57 P-1 MARK.

09 00 01 58 [SPLASHDOWN]

09 00 01 59 CMP We did it, Ed.

09 00 02 00 CDR You got it.

09 00 02 03 CMP Hey, I think we made it.

09 00 02 04 CDR Hey, we did.

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Day 10

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09 00 02 05 CMP We made it. ... Good show.
09 00 02 08 CDR Okay. Ha ha!
09 00 02 10 LMP ... circuit breaker ...
09 00 02 12 NEW Apollo 14, this is New Orleans. Welcome home.
09 00 02 14 CDR Thank you, sir.
09 00 02 15 CMP Thank you, sir.
09 00 02 16 CDR We're Stable I. Everybody's in good shape.

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