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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Classification changed to U
By authority of JSC Security Class. Officer
Date 2-5-73 — 2-9-78 — Sally H...

APOLLO 13 ONBOARD VOICE TRANSCRIPTION (U)

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

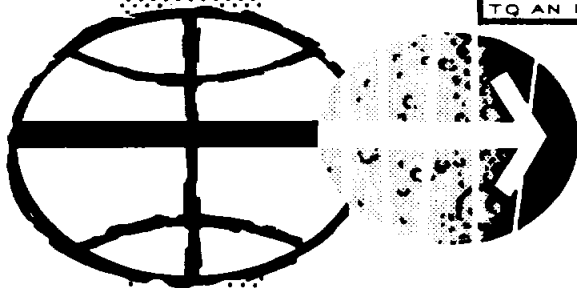
APRIL 1970

GROUP 4

DOWNGRADED AT 3 YEAR INTERVALS
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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 flightcrew 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 13 flightcrew 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 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.

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

The Apollo 13 mission was flown April 11 to 17, 1970.

Speakers in the transcript are identified as follows:

Spacecraft:

CDR	Commander	James A. (Jim) Lovell, Jr.
CMP	Command module pilot	John L. (Jack) Swigert, Jr.
LMP	Lunar module pilot	Fred W. Haise, Jr.
SC	Unidentifiable crewmember	
MS	Multiple speakers	

Mission Control Centers:

CC	Capsule communicator (CAP COMM)
LCC	Launch control center

The transcript is divided into three columns--time, speaker, and text. The time column consists of four two-digit pairs for 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.

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Day
Hour
Min
Sec

DAY 1

-00	00	00	10	LCC	10, 9, 8, 7, 6, -
-00	00	00	05	LCC	IGNITION -
00	00	00	00	LCC	4, 3, 2, 1, 0 -
00	00	00	01	LCC	LIFT-OFF.
00	00	00	02	CDR	The clock is running. ...
00	00	00	03	CMP	Yes.
00	00	00	05	CMP	Yaw program.
00	00	00	10	LCC	Clear the tower.
00	00	00	11	CDR	Clear tower.
00	00	00	14	CDR	The yaw complete and roll program.
00	00	00	16	CC	Houston; Roger roll.
00	00	00	19	CDR	2000 feet.
00	00	00	30	CC	13, Houston. GO at 30 seconds.
00	00	00	32	CMP	Okay, you're right on, Jim. You're right on trajectory.
00	00	00	34	CDR	Roll complete and we're pitching.
00	00	00	37	CC	Roger that. Stand by for Mode I Bravo.
00	00	00	42	CC	I Bravo.
00	00	00	43	CMP	I Bravo.
00	00	00	44	CDR	RCS COMMAND.
00	00	00	45	CMP	I Bravo.
00	00	00	48	CDR	One-and-a-half g's. Okay, high Q coming up.
00	00	00	52	CMP	Okay.

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00 00 00 55 LMP Cabin's coming down.

00 00 00 57 CDR ALT is looking good.

00 00 01 02 CMP Okay, you're right on - -

00 00 01 03 CC 13, Houston. GO at 1. We show the cabin relieving.

00 00 01 05 CMP Yes.

00 00 01 06 CDR 13; Roger.

00 00 01 07 CMP You're right on, Jim.

00 00 01 09 CDR Coming up on 2g's. ALT is looking good.

00 00 01 17 CDR Two g's.

00 00 01 26 CDR ALT is looking good.

00 00 01 31 CMP Okay, you're right on at 01:30. 10 4 - a little bit high - we're a little bit high, about 0.4 of a mile.

00 00 01 37 CDR Got to speak louder.

00 00 01 39 CMP Okay.

00 00 01 40 LMP Cabin's looking good.

00 00 01 43 CDR Two-and-a-half g's and we're looking good in alpha.

00 00 01 50 CDR 40 000.

00 00 01 55 CC 13, Houston. Stand by for Mode I Charlie.

00 00 01 57 CDR Roger.

00 00 01 58 CC ... I Charlie.

00 00 01 59 CDR MARK.

00 00 02 00 CDR I Charlie.

00 00 02 01 CMP/LMP I Charlie.

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00 00 02 02 CC And, 13; you're GO for staging.
00 00 02 04 CDR GO for staging. Roger.
00 00 02 05 CMP We're EDS, manual.
00 00 02 07 CDR Okay.
00 00 02 08 CC ... that.
00 00 02 11 CDR Three-and-a-half g's.
00 00 02 15 CDR Inboard. ...?
00 00 02 27 CC Confirm inboard out, 13; you're looking good.
00 00 02 29 CDR Roger.
00 00 02 42 CDR Coming up on 4g.
00 00 02 45 CMP Got a little flash out the window.
00 00 02 48 CDR S-II ignition.
00 00 02 50 CMP ...
00 00 02 51 LMP Yes.
00 00 02 52 CDR We have half a g; looks good.
00 00 02 57 CMP Okay, 3 min. That's the babe.
00 00 03 00 CC 13, Houston. Trajectory is good; thrust is good.
00 00 03 03 CDR Roger.
00 00 03 04 CMP She's right on, Jim.
00 00 03 06 LMP Stand by for tower JETT.
00 00 03 14 CMP Skirt SEP.
00 00 03 16 LMP Okay, tower JETT.
00 00 03 17 CDR Roger.
00 00 03 18 LMP/CDR Tower JETT.

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00 00 03 19 CMP Beautiful.

00 00 03 20 CC Confirm skirt SEP; Roger tower JETT; Mode II, Jim. Looking good.

00 00 03 22 LMP Look at that.

00 00 03 24 CDR Mode II.

00 00 03 28 LMP Look at the horizon out there.

00 00 03 29 CMP Yes. There it comes.

00 00 03 32 LMP That plume!

00 00 03 33 CDR Guidance initiate.

00 00 03 34 LMP That plume! Boy, is she boiling. That really - -

00 00 03 38 CMP Here.

00 00 03 39 LMP - - points away, there. Window is not too bad.

00 00 03 43 CC 13, Houston. Guidance is good, and the CMC is GO.

00 00 03 46 CMP Okay. Thank you.

00 00 03 47 CDR 13; Roger.

00 00 03 49 CMP Okay, we're Mode II; I'm set for staging.

00 00 03 52 CDR Mode II. Got them all RATE COMMAND and hang on.

00 00 04 00 CDR Four minutes.

00 00 04 03 CMP Okay, Jim, we're right on.

00 00 04 04 CDR Okay.

00 00 04 05 CMP Trajectory's looking good.

00 00 04 06 CDR Want a little bit more light?

00 00 04 07 CMP No, no. That's it - -

00 00 04 08 CDR How's this?

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00 00 04 09 CMP Yes. That's fine.

00 00 04 12 CDR 04:11.

00 00 04 13 LMP Cabin's settled out very nicely.

00 00 04 14 CMP Yes.

00 00 04 15 CDR Okay.

00 00 04 16 CC 13, Houston. You're GO at 4 minutes. The little red lines are right on the little white lines down here.

00 00 04 22 CDR Sounds good.

00 00 04 30 CDR Coming up on one g.

00 00 04 31 CMP Boy, we're right on. We're about a mile and two-tenths high, though, but we're right on V_I and right on H-dot.

00 00 04 36 CDR That's ... One g. You could walk around here.

00 00 04 51 CMP I bet I never had such a view. Fred-o ... - -

00 00 04 55 CC 13, Houston. Coming up 5 minutes; you're looking perfect. Over.

00 00 04 59 CDR 13, Roger. Coming to gimbal motors.

00 00 05 04 CMP Okay. Watching 8.

00 00 05 32 CMP Inboard.

00 00 05 36 CC We confirm inboard out.

00 00 05 38 CDR That shouldn't have happened.

00 00 05 40 CMP No. That's 7:42. That's 2 minutes early.

00 00 05 44 CC 13, Houston. Stand by for S-IVB to COI capability.

00 00 05 48 CDR S-IVB to COI. Roger.

00 00 05 49 CC Roger. You've got it now, Jim.

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00 00 05 52 CDR We've got S-IVB to COI.

00 00 05 53 CMP Okay. Gim [sic] motors, Jim. Set 1.

00 00 05 55 CDR Okay. PITCH 1.

00 00 05 57 CMP Good.

00 00 05 58 CDR YAW 1.

00 00 05 59 CMP Good. PITCH 2.

00 00 06 00 CDR PITCH 2.

00 00 06 01 CMP Good.

00 00 06 02 CDR YAW 2 - -

00 00 06 03 CC You're GO at 6 minutes, 13.

00 00 06 06 CDR GO at 6. And, Houston, what's the story on engine 5?

00 00 06 14 CC Jim, Houston. We don't have a story on why the inboard out was early, but the other engines are GO and you're GO.

00 00 06 21 CDR Roger.

00 00 06 24 LMP Okay. We're - we're a little bit low on H-dot, now, but that's to be expected.

00 00 06 28 CDR Okay. We're Mode II, gentlemen, Mode II.

00 00 06 41 CC 13, Houston. You're still looking good; your gimbals are good; trim is good.

00 00 06 45 CDR Roger. We just checked the trim. It doesn't fit.

00 00 06 53 CC 13, Houston. Level sense arm time, 8 plus 38, nominal; S-II cut-off time, 9 plus 48. Over.

00 00 07 01 CDR Roger. Nominal on the level sense arm, 09:48 on the S-II cut-off.

00 00 07 06 CMP It's going to run - -

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00 00 07 07 CC Affirmative, and stand by for S-IVB to orbit.
You have S-IVB to orbit, Jim.

00 00 07 13 CDR Roger. We have S-IVB to orbit.

00 00 07 23 CDR Didn't like that inboard.

00 00 07 32 CMP Okay, we're 1400 feet a second low on V_I .
That's not too bad.

00 00 07 38 CDR Watch the trajectory closely, Jack.

00 00 07 41 CMP Yes, ...

00 00 07 48 CMP We're right at 8 ... - H-dot is a little bit
low; V_I is low, but that's understandable.

00 00 07 53 CDR Okay.

00 00 07 56 CMP You're S-IVB to orbit capability now.

00 00 08 01 CC 13, Houston. Looking good at 8 minutes.

00 00 08 05 CDR 13; Roger. How's those systems, Fred? Are
there any - -

00 00 08 08 LMP They're looking good.

00 00 08 13 CMP Okay, now, H-dot is low, Jim. ... S-IVB ought
to pick you up.

00 00 08 19 CDR Yes. Hey, I got a - We got a funny vibration
...

00 00 08 27 LMP Yes. Yes, there was a bit of noise, there. Yes.

00 00 08 31 CMP ...

00 00 10 28 LMP Right on 8; good on H-dot; 200 feet a second
low on V_{Isp} .

00 00 10 32 CDR Remember, we're Mode IV now.

00 00 10 34 LMP Yes, I got that. Mode IV.

00 00 10 46 LMP Looks good -

00 00 10 49 CDR What?

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00 00 10 51 LMP Everything looks good.

00 00 10 54 CDR Everything looking good.

00 00 10 57 LMP We're looking good, Jim; trajectory's looking good.

00 00 11 00 CDR Okay, ...

00 00 11 15 CMP ...

00 00 11 19 CDR What?

00 00 11 23 LMP Okay, going to ... deadband now, guys. We're 102.5 - shutdown velocity -

00 00 11 32 CDR 25 562.

00 00 11 34 CC Apollo 13, Houston. You're GO at 11-1/2, and predicted cut-off time is 12 plus 34. Over.

00 00 11 41 CDR Understand; 12 plus 34, predicted cut-off time.

00 00 11 45 CC ... affirm.

00 00 11 46 LMP 25 562 looks good.

00 00 11 58 CMP Okay - Do we shut down at - Fred-o?

00 00 12 02 LMP Yes.

00 00 12 03 CMP What's - Shutdown is when?

00 00 12 05 LMP ... you get the last page, Jack; you got the cleanup stuff.

00 00 12 14 CDR Stand by for SECO.

00 00 12 15 LMP All the systems stuff. You got to ... SECO.

00 00 12 18 CMP Yes.

00 00 12 20 LMP I'm going to just jump right in ...

TIME SKIP

00 00 23 25 CMP Hey, you guys, are you ready? I've done my other item there; I'm ready to give you - ...

00 00 23 30 CDR Well, all right, fine. Let's just get this one done first.

00 00 23 33 CMP Okay.

00 00 23 34 CDR What else do you have to do here?

00 00 23 35 LMP Okay. Going BIT RATE.

TIME SKIP

00 00 23 46 SC Okay.

00 00 23 47 CDR Okay. The pressure's okay?

00 00 23 49 LMP Yes. Let's see now, Jim, there's one more reading there; you gave me the - you gave me the helium pressure 4100. What's the manifold pressure on that one?

00 00 23 59 CDR The manifold pressure is reading about 80.

00 00 24 05 LMP Eighty? Okay, give me the number 1, then.

00 00 24 07 CDR Okay, number 1. And helium temperature is 80, helium pressure is 4100, and the manifold pressure is about 100.

00 00 24 18 LMP Manifold's about 100. Okay.

00 00 24 19 CMP Okay, Fred-o. Have a look - the cabin and suit doing? Before we - -

00 00 24 22 LMP They're both pretty equal, now, at about 5/5.

00 00 24 25 CMP/CDR Okay.

00 00 24 26 CDR Well, let's - We'll break the ...

00 00 24 27 CMP Okay, let's do it. Fred-o, here's your bag.

00 00 24 32 LMP Okay. Jim.

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00 00 24 39 LMP Okay, for that item, those two I can check off. You got the V-torquing angle?

00 00 24 43 CMP Yes.

00 00 24 44 LMP I've checked the caution and warning; you've done that. We're up - we're up to item 9.

00 00 24 49 CMP How we doing time line?

00 00 24 51 LMP We're a little behind, but it's the kind of stuff that we can catch up lickety-split with.

00 00 24 57 CMP Okay.

00 00 25 04 LMP Okay. Let me get - make sure I got this item. I want A, SIMPLEX. Hell, it was already there. B to OFF. No, it wasn't. It's just a hard switch again. They really fake you out, these switches - -

00 00 25 18 CMP Yes. I've noticed - -

00 00 25 19 LMP - - they move so hard.

00 00 25 20 CMP I've noticed that, Fred.

00 00 25 21 LMF Compared with the simulator. Okay, let me check item 13 off; I've completed that one. Let's see.

00 00 25 30 CMP Yes. I've got - -

00 00 25 37 CDR Jack, be careful in your movements now.

00 00 25 39 CMP Yes. I'm not having any problems so far.

00 00 25 41 CDR Okay.

00 00 25 43 LMF PCM BIT RATE is LOW. I did the COMMAND RESET in NORMAL. I'll do it again, just to make sure. I have an A, SIMPLEX, and B, OFF. That's great. Jack, could you hand me one thing?

00 00 25 58 CMP What - what would you like?

00 00 25 59 LMF One of those spring jobbers, there. I can - -

00 00 26 00 CMP Yes.

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00 00 26 01 LMP - - flip across - -

00 00 26 02 CMP I was going to ask you, if you wanted one of those, Fred.

00 00 26 03 LMP Yes. Okay. Now that'll take care of my check-list for me.

00 00 26 15 CMP A springy jobber coming up.

00 00 26 17 LMP Thank you. No, no; you got one of the other ones with the hook?

00 00 26 24 CMP I got the wrong kind?

00 00 26 25 LMP Yes. It's a little longer one with the hook.

00 00 26 28 CMP Are they in the same - They in the same - ...?

00 00 26 35 LMP Now that's a good question.

00 00 26 37 CMP Well, I'll tell you - Let me - I don't see them down here, now.

00 00 26 41 LMP Sure enough. It really is zero g.

00 00 26 47 CDR Well, gentlemen, I'll break out my two gold pens.

00 00 26 50 LMP The longest Napierian trajectory in the world.

00 00 26 56 CMP Yes. We had - I had a long boost ride, didn't we?

00 00 26 59 LMP Man!

00 00 27 00 CDR Twelve minutes and 30-some seconds.

00 00 27 01 LMP I'll tell you, gang, I was a little worried for a pinch or two.

00 00 27 04 CDR When I called, "Inboard," I was - It was natural; then I looked at the time - -

00 00 27 07 CMP Yes - -

00 00 27 08 CDR - - and I said, "That's not natural."

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00 00 27 09 CMP We were 2 minutes early. Five minutes and 32 seconds, if you want to write that down.

00 00 27 12 CDR Okay, good. Okay, my helmet coming off.

00 00 27 15 LMP Shoot, if they recorded that - -

00 00 27 16 CMP - - (Laughter) Yes - -

00 00 27 17 LMP - - it'd be heck.

00 00 27 18 CMP (Laughter) I know it.

00 00 27 24 CMP Well, you know, I think I'll just - I'll just let this thing pull right up to the top.

00 00 27 29 LMP You haven't found that other one, yet, have you?

00 00 27 30 CMP No, Fred; I haven't -

00 00 27 32 CDR What are you looking for?

00 00 27 33 LMP A clamp. Oh - -

00 00 27 35 CMP I think those are down - those are in one of the lower -

00 00 27 38 LMP Okay. You want to give me that other one back here, I'll see if I - Trouble is, I got no hooks that are the right length apart for my goddamn ... Fiddle with it. I'll just hang on to it tight and ...

00 00 27 55 CMP By golly! Guys!

00 00 28 03 LMP Hey, that's - All that stuff about the helmet's being hard to get into the bag is the truth.

00 00 28 15 CDR Okay, let's see. At ... 52:36, we're going to pick them up over Canaries.

00 00 28 20 LMP Great - -

00 00 28 21 CDR And, gentlemen, you are now passing the beautiful Atlantic Ocean.

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00 00 28 30 LMP I'm glad we checked PGNCS.

00 00 28 37 CDR Say, I never thought - You guys want to take a look - look at - Excuse me a second. I'm going to turn out those floodlights. I wanted to show ... - When I turn out all the lights in just a second, you can see thunder and lightning on the horizon.

00 00 28 55 CMP Sure as hell can.

00 00 28 56 CDR And also, you might be able, if your eyes become accustomed to it - you might be able to see the - the airglow. There, you can. You can see the airglow.

00 00 29 05 CMP Yes. I sure can.

00 00 29 06 CDR See that airglow?

00 00 29 07 CMP I can see that lightning, too.

00 00 29 09 LMP Oh, I - I won't be able to see ...

00 00 29 10 CMP Hey, that's -

00 00 29 12 LMP El Scorpio, isn't it?

00 00 29 13 CDR Yes, but see the - Antares is in the airglow layer.

00 00 29 16 CMP Yes, it is. Right in it.

00 00 29 18 CDR And then right below that, way - about a half a degree, that's -

00 00 29 20 CMP The next star down there?

00 00 29 21 CDR Yes.

00 00 29 22 LMP Yes.

00 00 29 23 CDR So, if you lift the lights, we'll see again.

00 00 29 27 CMP Okay, I'm ready for the main REG check, Fred, if you're ready.

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00 00 29 30 LMP Okay. Go ahead. I'll tell you when. ... just call it on.

00 00 29 35 CMP Okay. MAIN REG B going closed. EMERGENCY CABIN PRESSURE selector 1, PUSH TO TEST.

00 00 29 45 LMP Did you PUSH TO TEST?

00 00 29 46 CMP Yes. There it is.

00 00 29 47 LMP Good.

00 00 29 48 CMP Okay.

00 00 29 49 LMP Good.

00 00 29 50 CMP MAIN REG B valve, OPEN; A going closed.

00 00 29 54 LMP Closed. Next step?

00 00 29 55 CMP CABIN - CABIN PRESSURE selector 2, PUSH TO TEST.

00 00 30 00 LMP Okay, that's good.

00 00 30 02 CMP MAIN REG valve B - or A, OPEN, and EMERGENCY CABIN PRESSURE selector, closed. Okay, Jim. I got to get to - to those ... here.

00 00 30 14 CDR Okay.

00 00 30 23 CDR Okay.

00 00 30 24 CMP ... down there?

00 00 30 27 LMP Up in L-2, Jack.

00 00 30 28 CMP Yes, that's where I'm looking.

00 00 30 32 LMP You're kidding. I thought you said the helmet was tough to get in this bag. Piece of cake. Have you got - have you got one of those big helmets?

00 00 30 41 CMP Yes - No, I don't think - unless I got a bigger head.

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00 00 30 44 LMP You don't have a Borman special, do you?

00 00 30 46 CMP No.

00 00 30 47 CDR We all have Borman specials.

00 00 30 48 CMP Really?

00 00 30 49 CDR Yes.

00 00 30 50 CMP Maybe your damn bag won't fit anymore with that one ... have to slip it in this one.

00 00 30 54 LMP Yes. ... a little bit. I got a ...

00 00 31 06 CDR Okay. Got a ...?

00 00 31 09 CMP Yes.

00 00 31 12 CDR Well, is there anything else we can be doing right now? Like COAS?

00 00 31 14 LMP Yes.

00 00 31 15 CMP You can - -

00 00 31 16 CDR Yes.

00 00 31 17 CMP - - you can get out the ORDEAL box, if you could - -

00 00 31 18 CDR Yes - -

00 00 31 19 CMP - - could you do that, Jim?

00 00 31 20 CDR I'm going to try it right now.

00 00 31 21 CMP That would save me a trip down under there.

00 00 31 22 CDR Okay, that's right.

00 00 31 25 CMP Okay. Okay - -

00 00 31 28 CDR You got to watch the time right now for -

00 00 31 29 CMP Yes.

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00 00 31 30 CDR Okay.

00 00 31 35 CMP I don't - I got to go stow my water wings. You guys got your water wings on?

00 00 31 40 LMP No. I don't think I'm going to fiddle with that right now, Jack. They're not in my way.

00 00 31 45 CMP Yes. I'll trade. We can get that later.

00 00 31 46 LMP Hell, yes.

00 00 31 48 CDR Well, I'll tell you what - I blew mine on 8.

00 00 31 52 CMP Did you?

00 00 31 53 LMP Yes. But you were the guy that - Jack should take his off. He's the guy moving around.

00 00 31 57 CDR You're right.

00 00 31 58 CMP Okay. I'll take mine off.

00 00 32 00 CDR ... really want ...

00 00 32 05 LMP Man, I'll tell you, that first stage -

00 00 32 08 CMP ...

00 00 32 09 LMP When that shut down, man, I thought I was going through the instrument panel. I'll tell you, that was - I was so surprised ... I had heard about it.

00 00 32 20 CDR I should have warned you.

00 00 32 22 LMP (Laughter)

00 00 32 23 CMP Yes, well. Something else - -

00 00 32 24 LMP Well - -

00 00 32 26 CMP - - you got to get into.

00 00 32 27 CDR ... right in ...

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00 00 32 28 LMP Okay, let's see. Confirm normal, we've done that. We've stowed the water wings. Now it's the TSB is the only item left outstanding there.

00 00 32 36 CDR Okay, I have the ORDEAL in place. Now, do you want the camera bracket?

00 00 32 44 CMP Yes, you better leave that camera bracket up there.

00 00 32 50 LMP Yes. Yes, I can feel a little bit of the zero-g effect, a little flushing in the face.

00 00 32 54 CMP Yes.

00 00 32 55 CDR Yes, that's that - Your blood rushes to your head because your heart doesn't have anything to pump against.

00 00 33 02 CMP Yes, I can feel that, too.

00 00 33 05 CDR Okay, I have the camera bracket.

00 00 33 08 CMP Okay, have you got the - the ORDEAL mounted? I have - -

00 00 33 10 CDR The ORDEAL is mounted.

00 00 33 11 CMP - - ... - -

00 00 33 12 LMP Okay, Jim. Are you ready to get busy on getting the RADs on the line?

00 00 33 16 CDR I sure am.

00 00 33 17 LMP GLYCOL RESERVOIR BYPASS valve, OPEN.

00 00 33 19 CDR Okay, GLYCOL RESERVOIR BYPASS valve to OPEN.

00 00 33 25 LMP Okay, OUT valve, CLOSE.

00 00 33 27 CDR OUT valve, CLOSE.

00 00 33 29 LMP The IN valve, CLOSE.

00 00 33 31 CDR The IN valve going CLOSE.

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00 00 33 34 LMP Okay, now we need a little bit of quantity in the ACCUM - not the ACCUM, but we need the fuel valve on for about 5 percent on down to 45 percent. That's about what it was in the ..., too.

00 00 33 46 CDR Okay, what I'm going to do is - -

00 00 33 47 LMP CAP COMM said they wanted 50.

00 00 33 48 CDR - - ... the ORDEAL, then. The number 1 ball. Did you check the VERB 82?

00 00 33 57 CMP Yes, I did. I wrote it down.

00 00 33 59 CDR Okay.

00 00 34 00 CMP I did that whole thing.

00 00 34 01 LMP And we got the secondary RAD leak check to go. We got the "Unstow and mount TSB."

00 00 34 07 CMP Yes. I ... done that, too.

00 00 34 10 LMP And I got water wings in my lap here. That's it on that item - that page; it's done. So we're hanging up here. Let me proceed ahead and see what I can. I can do a purge. There are not any left for another 12 minutes or so.

00 00 34 28 CMP Let me get the - -

00 00 34 29 LMP ...

00 00 34 30 CMP I got to get - -

00 00 34 31 LMP EPS monitor check, I can do ... I've been looking ahead to see what Jim can do. It says a GDC aline somewhere in this thing.

00 00 34 36 CDR Okay, I'm setting the ORDEAL right now.

00 00 34 40 LMP Okay, well, that's the next thing you can do is a GDC aline. Okay, you may - you may get some MASTER ALARMS here, gang. I'm going to be doing a purge check. I'll just do the - -

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00 00 34 55 CMP Fred-o.

00 00 34 56 LMP Yes.

00 00 34 57 CMP Look what I got.

00 00 34 58 LMP What have you got?

00 00 34 59 CMP One with a hook on the end of it.

00 00 35 01 LMP Beautiful.

00 00 35 02 CMP Spring jobber-do.

00 00 35 03 LMP Thank you.

00 00 35 09 CDR Now, is there anything I can be doing?

00 00 35 10 CMP I am giving you the sequence camera here, Jim.

00 00 35 13 CDR Okay.

00 00 35 14 CMP I tell you, I haven't checked the setting.

00 00 35 16 CDR How about your optics?

00 00 35 17 CMP I've got them unstowed. Now. ... that'd be 32.

00 00 35 32 CMP ... camera. Here's the power cable.

00 00 35 36 CDR Thank you. Okay, 18 millimeter, f:8, and 250th.

00 00 35 47 CMP Now, let's see. Let me give you a - it's f:8,
250th, 7 feet, 12 frames per second.

00 00 35 54 CDR Okay. Go.

00 00 35 55 CMP Magazine A.

00 00 35 56 CDR Magazine A is on.

00 00 35 58 LMP Hey, Jack, where'd you find these?

00 00 36 00 CMP I found it right down in - Fred, in this stowage -

00 00 36 03 LMP Do you have any longer ones?

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00 00 36 04 CMP No.

00 00 36 05 LMP (Laughter)

00 00 36 06 CMP No. It - -

00 00 36 07 LMP But that wasn't quite that long.

00 00 36 08 CMP Yes, I know they do. And I'll tell you where
it is; it's down in - -

00 00 36 10 LMP Okay.

00 00 36 11 CMP - - A-8. Can you make do with that for a
minute?

00 00 36 13 LMP Yes. I ...

00 00 36 14 CMP Until I get - Okay, have you got ORDEAL - You
got ORDEAL mounted?

00 00 36 22 CDR I - I have ORDEAL mounted.

00 00 36 24 CMP There we go.

00 00 36 25 LMP Okay - -

00 00 36 26 CMP I got to get - -

00 00 36 27 LMP - - right after - When did we insert, gang?
Twelve something?

00 00 36 31 CDR 12:32 ...

00 00 36 33 LMP Okay. I'm looking for where I put the first
line heater on, so it was roughly about 14
minutes. We've been - we've been 20 minutes.
Yes. ... Okay ...

00 00 36 43 CDR Don't forget I still got the radiators bypassed
here.

00 00 36 45 LMP Yes. Okay, what I need though, Jim, is to - We
got to pump up the - You want to - Let's finish
that item. I need to pump up the accumulator a
little bit. I mean use the accumulator to -
Yes - to get it up to 50 percent.

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00 00 36 58 CDR Okay, you tell me what you want me to do here and I'll -

00 00 37 01 LMP Can you reach the PRIM ACCUM FILL valve, right there on your left?

00 00 37 05 CDR I'll try.

00 00 37 07 LMP Yes, that's the PRIMARY. How are you doing, Jack?

00 00 37 11 CMP Okay.

00 00 37 12 LMP My countdown under way already?

00 00 37 13 CMP Yes. But, you want to have a few ...?

00 00 37 19 LMP Yes.

00 00 37 32 CDR Okay, I'm putting the cable for you.

00 00 37 39 LMP Excuse me a second; I want to ... the O₂ flow. Okay. Looks good. But if we get a MASTER ALARM, it'll come on with the H₂. Okay? Fuel cell 2. O₂ flow.

00 00 37 56 SC ...

00 00 37 57 LMP When it comes up flow, the H₂ banks up there like crazy. Looks like the simulator. The O₂ isn't like the simulator. Yes, it gets up there real slow. That old H₂ - Stand by for another MASTER ALARM. It banked up there like nothing flat. Okay. They're all back down to - -

00 00 38 20 CMP Before I get the - -

00 00 38 21 LMP - - normal.

00 00 38 22 CMP -- TSBs out, can I get P52 ... program start?

00 00 38 27 CDR Yes. Go ahead.

00 00 38 28 LMP Yes.

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00 00 38 29 CDR Get it to cover one that that doesn't.

00 00 38 31 CMP Yes. I'll ...

00 00 38 34 MS ...

00 00 38 35 CDR That's the fourth, Jack. Better do that.

00 00 38 37 LMP Okay. It's all optic tracking. I've done that. ZERO ... G&N POWER OPTICS, on, up. OPTICS MODE, MANUAL. ... DIRECT ... HIGH. OHC, MAX right.

00 00 39 01 CDR Okay, do I have a tool there someplace? Can I use an E tool?

00 00 39 09 LMP ...

00 00 39 11 CDR You got it uncovered?

00 00 39 13 LMP Got tool E?

00 00 39 14 CDR Yes, until I get that up for a fit.

00 00 39 15 LMP Okay ...

00 00 39 17 CDR Now, Fred, what do you want me to do?

00 00 39 19 LMP Okay, next - next thing is to - ... back - page - I need to find the ... fuel valve on. You can't take your eye off it. I got him out the window. Is that it? I got the airglow there.

00 00 39 43 CDR Okay.

00 00 39 52 LMP Make sure you get the right one, Jim. PRIMARY ACCUM - -

00 00 39 54 CDR Yes. I got it - I got - I got my - If I can get my hand down there, I got it made.

00 00 40 01 CMP Let me know when you turn them on. I only need about 5 percent; I don't need much.

00 00 40 13 CDR Okay. Coming ON.

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00 00 40 17 CMP Good. That's good. ... OFF.

00 00 40 19 CDR OFF.

00 00 40 20 CMP Okay, let me look a minute, here; I have to stabilize.

00 00 40 23 LMP ... up there.

00 00 40 25 CMP Okay. About one more shot.

00 00 40 27 CDR ...

00 00 40 31 CMP ... slowly, that really ...

00 00 40 32 CDR Okay, how's that?

00 00 40 33 CMP That's good. OFF.

00 00 40 35 LMP ... back down there ... go to OFF.

00 00 40 38 CMP It's right at 50, though; the hell with it, that's good.

00 00 40 40 CDR Is it good?

00 00 40 41 CMP Yes; that's about 49.9.

00 00 40 45 CDR Okay.

00 00 40 46 CMP It is definitely OFF, right?

00 00 40 47 CDR Yes.

00 00 40 49 CMP ECS RAD CONTROL; let me go to POWER. Okay, PRIM GLYCOL TO RADs out, Jim; NORMAL, push - NORMAL, push in.

00 00 40 59 CDR Okay.

00 00 41 03 CMP Oh, I know - Hey, how about giving me - Do I have G&N POWER at 8:21?

00 00 41 07 LMP Yes, sir.

00 00 41 08 CMP Okay.

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00 00 41 09 LMP You got it.

00 00 41 10 CMP Okay.

00 00 41 12 LMP I'll get it ready for you ... stars out there.

00 00 41 20 CMP I've got a star in the - -

00 00 41 22 CDR Sextant?

00 00 41 23 CMP - - sextant, but I have nothing in the -

00 00 41 26 CDR Well, it might take awhile to do it with the scanning telescope, because your eyes have to get accustomed to it. It might not be where there are stars.

00 00 41 36 CMP Well, I've got one in the - I've got one in the -

00 00 41 40 CDR What star did you pick?

00 00 41 43 CMP 24.

00 00 41 44 CDR 24, that's - Gienah. Is it right on in the sextant?

00 00 41 52 CMP ...

00 00 41 54 LMP Okay, while you got the tool and you're over there, Jim, do you think you could get the secondary RAD loop check done?

00 00 41 59 CDR Yes.

00 00 42 00 LMP That's the guy way down there, the very -

00 00 42 04 CMP ... -

00 00 42 05 CDR We'll run through it, Jack, if you could -

00 00 42 10 CMP ...

00 00 42 14 CDR Mark it ... Okay, GLYCOL TO RADIATOR, SECONDARY?

00 00 42 18 CMP ...

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00 00 42 19 LMP Yes, but it's to - RAD NORMAL. Let me know when. I'll start my watch.

00 00 42 28 CMP Hey, there - there we go. Now I got stars. I don't think they ... until just now.

00 00 42 34 CDR Okay, I'm going to take her to NORMAL now.

00 00 42 36 CMP Beautiful, gang.

00 00 42 37 LMP All right.

00 00 42 39 CDR Oh, I don't know if I did it or not.

00 00 42 41 LMP You - you turned it?

00 00 42 42 CDR I don't think so, I think ... right in there.

00 00 42 44 CMP Spica's right in there, you guys.

00 00 42 48 LMP Okay.

00 00 42 50 CDR I - You know, I can get down there good, but I'm always on -

00 00 42 54 LMP Well, you'd know if you got the screw in the slot.

00 00 42 59 CDR Okay, now.

00 00 43 01 LMP Okay. Starting my watch. It's on SECONDARY.

00 00 43 03 CDR No, it's NORMAL now.

00 00 43 04 LMP Okay, you've got to leave it there for 30 seconds.

00 00 43 06 CDR Okay. Could you tell?

00 00 43 11 LMP What's that?

00 00 43 12 CDR Could you tell?

00 00 43 13 LMP Tell what?

00 00 43 14 CDR That I'm in NORMAL?

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00 00 43 15 LMP Yes.

00 00 43 26 CMP ... Good old Antares.

00 00 43 33 LMP Okay, that's it; put it back to close or off or wherever it - -

00 00 43 36 CDR BYPASS.

00 00 43 37 LMP BYPASS. Good. ... BYPASS?

00 00 43 40 CDR ... BYPASS.

00 00 43 41 CMP Well, he didn't show anything ... - -

00 00 43 43 CDR Okay, how is it? Okay?

00 00 43 44 CMP Yes. Looks good.

00 00 43 46 LMP Okay, I'm on page 2-14; coming up to EPS monitor check - -

00 00 43 50 CDR Okay, just be sure you -

00 00 43 51 LMP - - EPS. Checking them off.

00 00 43 53 CDR Check them all off, and ... -

00 00 43 56 LMP You got to do a GDC aline -

00 00 43 58 CDR I'll do that right now.

00 00 43 59 LMP You've got the sequence camera bracket and the ORDEAL, right?

00 00 44 02 CDR And those are all mounted, and we're all running on - -

00 00 44 04 LMP Okay, ORDEAL - -

00 00 44 05 CMP Hey, guys? Sorry.

00 00 44 07 LMP ...

00 00 44 08 CDR Yes. Okay, better record this down ... - -

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00 00 44 10 CMP I ain't got - I ain't going to let that pass,
man - -

00 00 44 13 CDR No?

00 00 44 14 CMP - - ... triangle bigger than hell.

00 00 44 15 CDR I'll give you a gold - gold star.

00 00 44 19 LMP ... got all that in your book, Jack?

00 00 44 21 CMP Yes. I'm going to write it on a ... here.

00 00 44 22 LMP Okay.

00 00 44 23 CDR I'll do a GDC aline now, Fred.

00 00 44 25 LMP Okay. Now I'm here, I'm going to go ahead and
... the secondary loop. Okay, SECONDARY LOOP
is coming on line, gang; AC 1 -

00 00 44 37 CMP Okay. Do we have to wait for MSFN to torque
this?

00 00 44 40 LMP That's that little extra whining you
hear, and it's the SECONDARY LOOP.

00 00 44 43 CDR Okay.

00 00 44 46 LMP Okay. ... go to the ...

00 00 44 49 CDR I can see the sludges in the ... burn.

00 00 44 53 LMP Yes.

00 00 44 56 CMP Damn! Sort of lost him.

00 00 45 01 LMP Okay. So that one is done, done - -

00 00 45 04 CMP Okay - -

00 00 45 05 LMP - - done, done, done to there - -

00 00 45 06 CMP Jim?

00 00 45 07 CDR Stand by.

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00 00 45 08 CMP Do I need a - to get MSFN? I don't need them to torque here, do I?

00 00 45 13 CDR I don't think so - Wait - Where are the torquing angles ...?

00 00 45 16 CMP I've got the torquing angles; let's see - ... - and it's 0.162 which is quite a bit less than - ...

00 00 45 40 LMP Okay, Jack, did you ever get my MAIN B breaker in down there?

00 00 45 44 CMP Yes, I did, in your COAS?

00 00 45 45 LMP Yes.

00 00 45 46 CMP MAIN B? I did.

00 00 45 47 LMP Yes. That's right.

00 00 45 48 CMP That's done.

00 00 45 49 LMP And - let me verify that the RADs and REACS CB sticks are out, and - off.

00 00 45 53 CMP Okay. ...

00 00 45 56 LMP Okay. I'll verify the MAIN BUS TIES are OFF -

00 00 45 59 CDR GDC's alined. 46 now. How we doing on the time line, Fred?

00 00 46 06 LMP Let's see, we're not - we're coming up 6 minutes - What we got to do is get the cameras - get the TV camera out next. We're about fixed.

00 00 46 18 CDR Okay.

00 00 46 19 LMP 01:05 is when I got to start playing with the TV.

00 00 46 22 CDR Okay.

00 00 46 23 LMP After we get our HSK LOS.

00 00 46 26 CMP ...

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00 00 46 28 CDR If you have time, I would suggest that you adjust your straps and strap it in again for TLI - just to make sure you got them okay.

00 00 46 40 LMP Okay. Still pressing on in here, and Jack's got to do that ...; I'll circle it.

00 00 46 47 CMP Okay, what do you have to do?

00 00 46 48 LMP The RADs and REAC breakers, six of them, out ...

00 00 46 55 CMP RAD, REAC, REAC, REAC - Okay, I can verify three RADs and three REACs out.

00 00 47 03 LMP Okay, good show.

00 00 47 17 LMP MAIN A 1 - MAIN A 2 -

00 00 47 34 LMP Okay. Bus voltage ...

00 00 47 43 CDR And, Jack, you want to put tool E down there on the handhold - toward the handhold?

00 00 47 47 LMP Yes. I haven't got ...

00 00 47 50 CMP Yes. I think I can get closer than that and ...

00 00 47 53 CDR Yes, that's right ...

00 00 47 56 LMP Okay.

00 00 47 59 CDR Okay, I've got the horizon out there and I've got the airglow layer. ...

00 00 48 12 LMP Okay, and we got the relay bus selected ... - I got to get this TSB ... Okay, item 15's done. And that makes one outstanding item, and I've got a couple from a few pages back.

00 00 48 31 CDR Okay.

00 00 48 32 LMP Right there. Unstow and mount TSBs - they're in A-1. ... down below. Hey, where do these - these guys go? They go right in the pocket of this L-shaped bag, don't they?

00 00 48 47 CMP ... water wings.

00 00 48 51 CDR I thought they went right behind you.

00 00 48 53 LMP Right there - Yes.

00 00 48 54 CDR Oh, yes. ... pockets.

00 00 48 59 LMP Okay. I'm up the ... monitor - ... look good -
H₂ flow - ...

00 00 49 26 CDR Okay, I ought to be getting down there - ...
How you doing, Jack?

00 00 49 34 CMP Good. Hey, how about that - Do you need - that
SECONDARY RAD valve?

00 00 49 40 CDR I got it.

00 00 49 42 CMP You got it already; okay.

00 00 49 43 CDR We got the secondary - we made the secondary
check; the filters finally came out a little
bit - -

00 00 49 46 LMP You did the ...

00 00 49 48 CDR - - and the ORDEAL's already out; the COAS is - -

00 00 49 50 CMP You got it running?

00 00 49 51 CDR - - ... little COAS ...

00 00 49 55 CMP Hey, Fred-o? ... that TSB. Okay?

00 00 49 58 LMP ... We're going to need it.

00 00 50 00 CMP Jim, do you need a TSB?

00 00 50 02 CDR ... a big one. Let's see; where did we stow
TSBs? We want to ...

00 00 50 11 LMP Here it is.

00 00 50 17 CDR Jack, whenever you get time, if you - want to
slow down a little bit, well, just come back
and we'll take these - lifevests off and get
this stowed out of the way.

00 00 50 26 CMP Okay. I'll be ready to do it whenever you -

00 00 50 46 CDR Once you get one of them in -

00 00 50 53 LMP How you doing, Jack? ... all right down there?

00 00 50 56 CMP Oh, yes. No problems yet. ... kind of worried
... 12.1 down ...

00 00 51 07 CDR Well, I wouldn't worry about it now. ... go
down yet. You're not getting those breakers;
that's what you're forgetting.

00 00 51 16 LMP The - Okay, now where - those - you want those
where?

00 00 51 20 CMP In front of the L-shaped bag, isn't it?

00 00 51 21 CDR In front of the L-shaped bag is - Why don't you
go down there and help him?

00 00 51 25 LMP Wait a minute, Jack; you don't go - I don't
think you go that way to get through.

00 00 51 28 CDR I think you come right down here, Jack, but -
Yes, there is - there's a ... - -

00 00 51 31 CMP Yes, but that's a long, long way to go.

00 00 51 32 CDR - - there's a ...

00 00 51 34 LMP Okay, you do that - and I'm going to get the
Hasselblad out for - this.

00 00 51 38 CDR Okay, now, if my - my hand controller is locked
and yours is locked - I'll tell you what, if
you can help me scootch over here a second - -

00 00 51 45 LMP Yes.

00 00 51 47 CDR - - I'll try and -

00 00 51 49 LMP Okay, I'll put my ..., Jim.

00 00 51 51 CDR Okay. Okay.

00 00 51 54 CMP Okay, I want to go back and see what - I've got

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to get the TV camera and the Hasselblad out,
and - -

00 00 52 00 LMP I think we ought to be having AOS, gang; we've
got - -

00 00 52 02 CDR 56 seconds.

00 00 52 04 LMP Okay. I - Let me call them.

00 00 52 11 LMP Look at me, Jack; I show gain.

00 00 52 13 CMP You show gain?

00 00 52 14 LMP Yes.

00 00 54 35 LMP How you doing?

00 00 54 36 CDR I got ... You got to get it when you're going
by.

00 00 54 39 LMP Okay.

00 00 54 40 CMP Yes, I've got - got it in my helmet bag right
now.

00 00 54 43 CDR Oh, okay, good.

00 00 54 49 CMP Boy, I'll tell you, that really bothers me ...

00 00 54 54 CDR Does it ...? Did you put it over far enough?

00 00 54 57 CMP Yes, that's where it went - when ... It's
looking good ..., and I don't think they
jettison until ...

00 00 55 05 CDR Oh.

00 00 55 08 CMP Okay. Now I've got to get the TV camera ...,
Fred-o - -

00 00 55 11 CDR Okay.

00 00 55 12 CMP - - ...

00 00 55 13 CDR You want to hand me that book, and I'll take a
look in it.

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00 00 55 15 CMP Yes. And also see if I've - all the things that I've done, ..., because I haven't checked them off a couple of places.

00 00 55 29 CMP Hey, Fred, what do you want first, TV camera?

00 00 55 32 LMP Yes. Just one more - Let me get through one more - system.

00 00 55 39 CMP That's off. That ... right down ... on the bulkhead.

00 00 55 43 LMP You get done, you're hooking up the cable. You got to do that part, though. We can't ... right there.

00 00 55 48 CMP All right. And I'll verify the CB power is off -

00 00 55 50 LMP ... off.

00 00 55 53 CDR I'm going to go back into the - ..., Jack; and look at ...

00 00 55 59 CMP Okay.

00 00 56 00 CDR ...

00 00 56 02 CMP Fred-o, you - How about a bracket?

00 00 56 04 LMP Well.

00 00 56 11 CMP Okay, that's ...

TIME SKIP

00 01 04 58 LMP Okay, Joe, I just wanted to - put on the TV switch at Honeysuckle to tune her up there.

00 01 05 18 CDR Fred, I'll read the pads, or you read the pads, or somebody read the pads.

00 01 05 22 CMP Hey, can I get a - a TV ...?

00 01 05 29 LMP Oh, yes, Jack. LOS Carnarvon.

00 01 05 35 CDR Okay. 1:45, 75 ... LOS at - ...

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00 01 05 51 CDR Okay, coming up. ...

00 01 06 07 CDR Fred, I'll get them when we get all relaxed.
I'll do that ...

00 01 06 14 CMP ...

00 01 06 20 CDR Hey, Jack, ...

00 01 06 25 LMP ...

00 01 06 33 CMP Yes, I can - yes, I can do it, Fred-o. ...

TIME SKIP

00 02 34 28 CMP ... now?

00 02 34 30 LMP ...

00 02 34 32 CMP ... 59 - ...

00 02 34 49 CDR What was this ...?

00 02 34 52 LMP ...

00 02 34 58 CMP ... and what are your FDAI angles ...?

00 02 35 01 CDR ...

00 02 35 03 CMP Okay, 59 - ...?

00 02 35 05 CDR ...

00 02 35 11 CMP Okay, I've got 59 and 30. How's that? Okay?

00 02 35 27 CMP ... the burn, ...

00 02 35 29 CDR ...

00 02 35 34 CMP Okay. ... burning, Jim.

00 02 35 37 CDR Okay. Here, I'll get out the ...

00 02 35 40 CMP ...

00 02 35 45 LMP ...

CONFIDENTIAL

[REDACTED]

00 02 35 46 CMP Burning!

00 02 35 48 CDR Okay. Watch that -

00 02 35 50 CDR IGNITION, Houston.

00 02 35 54 CC Copy that, Jim. Good deal.

00 02 35 56 CMP Okay. ... pitching her down a little bit, right here.

00 02 36 00 CDR ... There you go.

00 02 36 04 CMP ... Is that all right?

00 02 36 05 CDR Okay, you watch the - trajectory thrust?

00 02 36 09 CMP Yes.

00 02 36 25 CMP ... burned 14-second velocity V_I and ...

00 02 36 46 CDR ...?

00 02 36 47 CMP It's right on V_I ; we're right on V_I .

00 02 36 55 CDR Got both ... up?

00 02 36 58 LMP We got to leave these open.

00 02 37 06 CMP Okay, 01:30. Three minutes and - -

00 02 37 07 LMP 0.75.

00 02 37 09 CMP ...

00 02 37 17 CMP Right on - right on; ... little bit higher ...

00 02 37 30 CDR ...

00 02 37 35 CMP ...

00 02 37 37 CDR Watch the ...

00 02 37 44 LMP Okay, Jim, it's 2 minutes ...

00 02 37 51 CDR Houston, everything looks okay so far.

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00 02 37 55 CC Houston; Roger.

00 02 38 06 CMP Okay; we got 02:30 coming ..., Jim?

00 02 38 17 CMP Right on ... Right on H-dot; we're right on 8.

00 02 38 31 CMP Three minutes -

00 02 38 47 CMP ...

00 02 38 48 CDR All right.

00 02 39 02 CMP 3:30, Jim. 3.4.

00 02 39 06 CDR 3.4. Okay.

00 02 39 17 CMP Okay. We're right on.

00 02 39 19 CDR Okay. ...

00 02 39 27 CMP Okay, at 4 minutes. ...

00 02 39 36 LMP ...?

00 02 39 38 CDR Okay.

00 02 39 42 CDR Okay, we'll hold this down; we've got a little vibration.

00 02 39 45 LMP ...

00 02 39 47 CDR Yes.

00 02 39 57 CDR No, ... thousand, 200 ...

00 02 40 06 MS ...

00 02 40 07 CMP We're looking at 4 point ... -

00 02 40 09 CDR 4 point ..., okay.

00 02 40 16 CMP Right on at 30. A little bit high.

00 02 40 24 LMP And, Houston, we're noticing a little vibration during this burn.

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00 02 40 37 LMP Five minutes ... 4.6.

00 02 40 41 CDR Okay.

00 02 40 46 CMP ... a hundred ...

00 02 40 50 CDR Okay.

00 02 40 51 CMP H-dot is a little high ...

00 02 40 54 CDR Okay.

00 02 40 59 LMP 5:30 - 5 point - ... the same countdown, Jack,
and then start counting up.

00 02 41 06 CMP Okay.

00 02 41 07 LMP ...

00 02 41 08 CMP ... V_I ...

00 02 41 11 CDR ...

00 02 41 15 LMP Five seconds.

00 02 41 16 CMP Five ..., okay.

00 02 41 19 CDR Better get ...

00 02 41 22 CMP 5.0. ...

00 02 41 28 CDR/CMP/ 5 -
LMP

00 02 41 29 LMP 4, 3, 2, 1 - 1, 2, 3, 4 -

00 02 41 34 LMP Okay.

00 02 41 38 CDR ENGINE OFF. ...

00 02 41 39 LMP ... is three-quarter overburn.

00 02 41 42 CC Copy. Engine off.

00 02 41 44 LMP Freeze the DSKY.

00 02 41 45 CMP I did.

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00 02 41 46 LMP Okay, and now we'll - -

00 02 41 49 LMP Okay, Jim, it's SCS TVC SERVO POWER 1, OFF.

00 02 41 52 CDR 1's OFF.

00 02 41 53 LMP PCM BIT RATE, I got LOW. EMS MODE - Wait, let Jack get it. Minus 3.0.

00 02 41 57 CMP Boy, beautiful.

00 02 41 58 LMP You got that, Jack?

00 02 41 59 CMP Yes.

00 02 42 00 LMP EMS MODE to STANDBY?

00 02 42 01 CMP ...

00 02 42 03 CDR EMS MODE to STANDBY.

00 02 42 04 LMP STANDBY. FUNCTION, OFF.

00 02 42 06 CDR FUNCTION, OFF.

00 02 42 07 LMP SEQUENCE PYRO ARM, two, SAFE.

00 02 42 08 CDR SEQUENCE PYRO ARM, two, SAFE.

00 02 42 09 CMP That's a ..., too.

00 02 42 12 CDR Okay.

00 02 42 13 LMP Okay. SEQUENCE - FDAI 1, INERTIAL.

00 02 42 18 CDR FDAI 1 going INERTIAL.

00 02 42 20 LMP And lock your hand controller.

00 02 42 22 CDR Hand controller is locked.

00 02 42 24 LMP Okay, Jack, you clean up the DSKY and eventually get the POO.

00 02 42 27 CC ... we'll have you through Hawaii in 3 minutes.

00 02 42 30 CDR Roger. Through Hawaii in 3 minutes.

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00 02 42 33 LMP Okay.

00 02 42 34 CMP Okay - -

00 02 42 35 LMP So we're standing by until Jack gets through that - jazz -

00 02 42 38 CDR How does that look, Jack?

00 02 42 40 CMP Looks good.

00 02 42 45 LMP Okay, it's a VERB 66 ENTER, Jack, after you get - after you get the POO. Wait until you get that.

00 02 42 52 CMP ...

00 02 42 57 LMP Okay, now you all switch - En route, Jack, you got to do a couple of things.

00 02 43 07 CDR In Hawaii, we'll get their ... - -

00 02 43 12 CMP Okay. You - let me put this - put this up under here - -

00 02 43 17 LMP Okay.

00 02 43 18 CDR And we'll have to switch COMM carriers so I can take this suit stuff off.

00 02 43 20 LMP Yes. We'll have to take the suit power off.

00 02 43 23 CDR Yes. And we'll - -

00 02 43 24 LMP And what would be nice for you to do, Jack, if you can - -

00 02 43 27 CMP Okay. What do you want me to do?

00 02 43 28 LMP - - is, first of all, WASTE STOWAGE VENT valve, CLOSED.

00 02 43 30 CMP Okay. I'll do that right now.

00 02 43 38 LMP I've got the HIGH GAIN POWER, OFF, and I'm getting - I've got those two breakers in on 225. WASTE STOWAGE VENT valve is CLOSED.

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00 02 43 44 CMP CLOSED.

00 02 43 45 LMP Now, get the TV camera out from under there, will you?

00 02 43 47 CMP Okay.

00 02 43 48 LMP And I'll be dickering with that -

00 02 43 51 CMP ... -

00 02 43 52 LMP ...

00 02 43 54 CMP TV camera's - -

00 02 43 57 LMP Thank you. May as well get me the monitor and all that jazz.

00 02 44 00 CMP I'll go do that now.

00 02 44 02 LMP And the bracket. I'll be fiddling and getting this baby ready.

00 02 44 06 CMP One bracket.

00 02 44 08 LMP Thank you.

00 02 44 27 CMP Okay, Fred-o, now here's the monitor.

00 02 44 37 LMP Okay. Got a - Thank you. Okay. ...

00 02 44 53 LMP Okay. Okay. The ... are off - done.

00 02 45 14 CDR Stand by. ...

00 02 45 21 CMP It's funny.

00 02 45 25 CDR Okay, my SUIT POWER's going OFF - -

00 02 45 28 CC ... - -

00 02 45 29 CDR - - ... you got COMM - -

00 02 45 30 CC - - through Hawaii. Over.

00 02 45 32 CDR Roger, Houston; 13 through Hawaii. How do you read?

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00 02 45 37 CC 13, Houston. You're weak but clear; it'll probably get better in a second. We're standing by for the burn report.

00 02 45 43 CDR Roger. Jack, we need the burn report just briefly.

00 02 45 45 CMP Okay.

00 02 45 46 LMP Here, I'll get it.

END OF TRANSCRIPTION

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