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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION



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DATE

*u*  
*Memorandum*  
*Sec. Clas. Officer*  
*3/5/73*  
*J. D. Yates*

# APOLLO 9 ONBOARD VOICE TRANSCRIPTION

(U)

## RECORDED ON THE LUNAR MODULE ONBOARD RECORDER DATA STORAGE EQUIPMENT ASSEMBLY (DSEA)

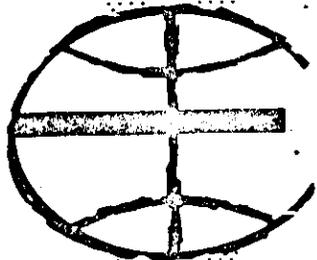
March 1969

GROUP 4

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## INTRODUCTION

This is the transcription of the Apollo 9 flightcrew communications as recorded on the lunar module (LM) data storage equipment assembly (DSEA). The DSEA tape cassettes, after use onboard the LM, were transferred to the command module for return to earth. The magnetic tapes, containing multiplexed voice and onboard-recorded mission elapsed time on a single channel, were then forwarded to the NASA Manned Spacecraft Center, Houston, Texas. Mission elapsed time was adjusted and appears as ground elapsed time in this document. Some of the timing was not recovered as is indicated by the blank or semiblank timing annotations in this transcript. The loss of timing is attributed to the fact that the design 3-second VOX record time delay was cut to 0.8 seconds. This change precluded the time-code translators from acquiring a lock on the timing signal. When the crew reconfigured to ICS mode (continuous recording), acquisition of lock on the timing signal returned to normal. 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 Apollo 9 mission was flown March 3 to March 13, 1969.

Communicators in the text are identified as follows:

CDR	Commander	James A. McDivitt
CMP	Command module pilot	David R. Scott
LMP	Lunar module pilot	Russell L. Schweickart
SC	Unidentifiable crewmember	

Mission Control Center:

CC	Capsule communicator (CAP COMM)
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In the text, a series of three dots (...) is used to designate those portions of the communications which 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.

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Day 2 - Page 1  
Tape 09-03601

DAY 2

01 20 00 46 LMP Gumdrop, Spider. How do you read?  
01 20 00 49 CMP ...  
01 20 00 52 LMP You're terrible. I got all kinds of noise here  
and I can't seem to squelch it out.  
01 20 01 03 LMP I got the squelches all the way up.  
01 20 01 15 LMP Same. Let me try my other PTT here. Okay, how  
do you read that?  
01 20 01 24 LMP Okay, fine. I'm going to try the VOX now.  
01 20 01 37 LMP Roger. 1, 2, 3, ...; 5, 4, 3, 2, 1.  
01 20 01 43 LMP Okay. How about now?  
01 20 01 47 LMP Okay. 1, 2, 3, 4, 5; 5, 4, 3, 2, 1.  
01 20 01 51 LMP Now, I'm going to switch antennas here.  
01 20 01 57 LMP Okay. I still got all kinds of noise; how do you  
read me?  
01 20 02 02 LMP ... you switching antennas.  
01 20 02 09 LMP That's a little bit louder, but I still got all  
the noise. Stand by.

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Day 2 - Page 2  
Tape 09-03601

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01 20 02 13 LMP Wait a minute. That's probably S-band noise. Let me turn down my S-band.

01 20 02 20 LMP Guess what. That was all S-band noise.

01 20 02 25 LMP Okay. I'm going back on the other antenna. How's that now?

01 20 02 31 LMP ... 5 square. Let's just stay here.

01 20 02 39 LMP Yes, I do have the tape on.

01 20 02 50 LMP Okay. Stand by. VHF B SQUELCH coming down.

01 20 02 54 LMP There it is. I've got it set on about 4-1/2.

01 20 03 06 LMP Okay. You ready to go over to A?

01 20 03 10 LMP Let's go Simplex A.

01 20 03 17 LMP Okay. How do you read on Simplex A?

01 20 03 21 LMP ... square.

01 20 03 33 LMP VHF B TRANSMITTER coming - I mean VHF B TRANSMITTER to DATA.

01 20 03 42 LMP We want the tape off now also, right?

01 20 03 52 LMP Gumdrop, Spider. You want the tape off now also?

01 20 04 04 LMP Tape coming off.

01 20 27 00 LMP Okay, tape, we're starting the hatch installation and it's 44:27:00. Starting the tunnel closeout I should say.

01 20 27 17 CDR Dave, I don't guess you'll need me for anything, do you? Oh, shoot, he can't read me. Dave, I don't guess you'll need me for anything more in the tunnel here. I'll go ahead and close up our hatch.

01 20 27 28 CMP I'd like to check the capture latches.

01 20 27 30 CDR Oh, okay. I'm up here waiting for you.

01 20 27 34 CMP ...

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Day 2 - Page 3  
Tape 09-03601

01 20 27 37 CDR Yes, I see your problem.

01 20 27 39 CMP Roger, those hoses are really something.

01 20 28 31 LMP Sure getting a lot of noise on the S-band.

01 20 28 33 CDR Are we?

01 20 28 43 LMP Houston, Spider.

01 20 28 46 CC Spider.

01 20 28 47 LMP We're picking up an awful lot of noise and static on the S-band again here.

01 20 28 54 CC Roger, understand. Gumdrops, are you getting it also?

01 20 28 59 CMP Roger, not bad.

01 20 29 05 CDR Did you say you were not getting it bad, Dave?

01 20 29 08 CMP No, I'm not getting it bad, but Gumdrops sounds clear ... I'm staying in S-band.

01 20 29 14 CC Okay, copy that. Did you copy Spider?

01 20 29 18 LMP Roger, I copied.

01 20 29 23 CDR Davey, I'm right here.

01 20 29 26 CMP Okay.

01 20 29 57 CDR Yes. Okay, that looks like it did it.

01 20 30 02 CMP Okay, I get a pole; and it flipped off.

01 20 30 04 CDR Yes, and all 3 out.

01 20 30 06 CMP Roger.

01 20 30 08 CDR Alrighty, I'll see you later. I'm going to close the door.

01 20 30 11 CMP Alrighty, have a nice time.

01 20 30 13 CDR We will.

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Day 2 - Page 4  
Tape 09-03601

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01 20 30 14 CMP I'll get dinner ready when you're ready.

01 20 30 16 CDR Man, am I hungry.

01 20 30 22 CDR Okay, let's go back to - oop. Where did the clip go that was on it?

01 20 30 30 LMP I don't know.

01 20 30 41 CDR Well, shoot. Well, I'll let you read it to me.

01 20 30 48 LMP Okay, you got the hatch closed?

01 20 30 49 CDR No, I haven't. Is that - Is that's - what's next? Close the hatch; is that next?

01 20 30 53 LMP Right.

01 20 30 55 CMP ... how much longer do we have here?

01 20 30 57 CC Okay, we're going to have you here for about another 3 minutes, and then we're coming up over Antigua at about 53. And I would like to pass to Spider also that we would like to try to pick up the nominal flight plan at Antigua with the secondary S-band check. We recommended eliminating the COMM check, and whatever you have to do to pick up the flight plan at that time.

01 20 31 25 CDR Tell him I think that's a great idea.

01 20 31 28 LMP Okay, Houston, we read you. This is Spider. What time is that pass at Antigua?

01 20 31 35 CC Okay, Antigua will be at 53.

01 20 31 39 LMP Roger, we'll be ready for you.

01 20 31 40 CMP Gumdrop copies.

01 20 31 43 LMP ... - -

01 20 31 44 CC Spider, we have no good data for that AOT ... We'll have to eliminate that. ...

01 20 31 59 LMP Roger, understand.

01 20 32 02 CDR Okay, what - -

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Day 2 - Page 5  
Tape 09-03601

01 20 32 04 CC ... burn ...

01 20 32 07 CDR Okay ...

01 20 32 09 LMP The hatch is closed and locked.

01 20 32 12 CC Gumdrop, I know with all the activity, I'd like to remind you of your CO<sub>2</sub> cartridge change that's due at 44:10.

01 20 32 20 CMP Roger, I'll have to get the tunnel closed out first, but I'll do it first chance.

01 20 32 24 CDR Why don't you read the rest of it, Rusty?

01 20 32 27 LMP Okay.

01 20 32 28 CMP Roger ...

01 20 32 30 LMP CABIN DUMP VALVE to AUTO.

01 20 32 32 CDR CABIN DUMP VALVE going to AUTO.

01 20 32 36 CC Spider - -

01 20 32 37 LMP Okay. CABIN REPRESS to AUTO.

01 20 32 38 CC - - bit rates.

01 20 32 40 LMP Roger, going LOW bit rate.

01 20 32 42 CDR CABIN REPRESS to AUTO. Clunk. Okay, we're AUTO.

01 20 32 51 LMP Boy, we got a lot of nuts and bolts around this thing.

01 20 32 54 CDR Yes ... we sure do. Okay, CABIN REPRESS is AUTO.

01 20 32 59 LMP Okay, PRESS REGS A and B to CABIN.

01 20 33 01 CDR PRESS REGS A and B to CABIN. PRESS REG A; PRESS REG B, CABIN.

01 20 33 11 LMP Okay, CABIN FAN CONTROL, CLOSE. Got it.

01 20 33 14 CDR Okay.

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01 20 33 15 LMP Look at this washer.

01 20 33 17 CDR Yes. Well, that's a good place for it. Okay, what's next?

01 20 33 25 LMP Okay. Glycol pump check.

01 20 33 28 CDR Okay.

01 20 33 29 LMP Except that's supposed to be done over the ground.

01 20 33 32 CDR Well - -

01 20 33 33 LMP That's desirable over the ground, but not mandatory.

01 20 33 36 CDR Let's do it. Let's do it now.

01 20 33 39 LMP R&D INSTRUMENTATION A, CLOSE. They might be ON; go ahead and do it.

01 20 33 42 CDR R&D INSTRUMENTATION A, CLOSE.

01 20 33 44 LMP DFI POWER, ON.

01 20 33 48 CDR DFI POWER, ON.

01 20 33 50 LMP GLYCOL PUMP to 1 - GLYCOL PUMP 1, OPEN; excuse me.

01 20 33 53 CDR GLYCOL PUMP 1, OPEN.

01 20 33 55 LMP Okay. What was that? That was DFI POWER, ON.

01 20 34 01 CDR No, that was MAS - that was GLYCOL PUMP 1, OPEN. I got that.

01 20 34 06 LMP Oh, okay.

01 20 34 07 CDR Why don't we have a component light on there?

01 20 34 12 LMP Because you didn't push in the circuit breaker yet. GLYCOL PUMP 1, CLOSED.

01 20 34 15 CDR Oh, yes.

01 20 34 17 LMP Okay, we got the component light. INSTRUMENTATION, SECONDARY.

01 20 34 22 CDR Okay.

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Day 2 - Page 7  
Tape 09-03601

01 20 34 24 LMP Okay, and it's 7. Wow!

01 20 34 33 CDR It really comes on, doesn't it.

01 20 34 34 LMP Good.

01 20 34 36 CDR Okay.

01 20 34 42 LMP Okay, now it's OPEN. GLYCOL PUMP to 2. ... is out of ... again.

01 20 34 57 LMP ECS GLYCOL PUMP AUTO TRANSFER, OPEN.

01 20 35 01 CDR ECS GLYCOL PUMP AUTO TRANSFER, OPEN.

01 20 35 04 LMP Okay, going to PUMP 1. Okay, there's PUMP 1. GLYCOL PUMP AUTO TRANSFER, CLOSED.

01 20 35 16 CDR AUTO TRANSFER, CLOSED.

01 20 35 18 LMP R&D TELEMETRY CAL, ON for 15 seconds.

01 20 35 21 CDR Okay, ON.

01 20 35 27 LMP Maybe you turn that DFI on, it heats the glycol up to the point where it puts on the light.

01 20 35 32 CDR Huh!

01 20 35 43 CDR Okay, go ahead.

01 20 35 45 LMP Okay - -

01 20 35 47 CDR DFI POWER, OFF.

01 20 35 48 LMP DFI POWER, OFF. R&D INSTRUMENTATION A, OPEN.

01 20 35 51 CDR A, OPEN.

01 20 35 54 LMP Ohhhh, boy. This tape re - You want to get this stuff behind me?

01 20 35 58 CDR Sure, I'll get all that stuff, Rusty. You just read it to me, I'll ...

01 20 36 01 LMP Okay, SUIT GAS DIVERTER. Pull to EGRESS. This is - a pressure integrity check.

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01 20 36 04 CDR PULL/EGRESS.

01 20 36 06 LMP CABIN GAS RETURN to EGRESS.

01 20 36 09 CDR CABIN - Oh, CABIN GAS RETURN, EGRESS. Roger, EGRESS.

01 20 36 16 LMP SUIT RELEASE, CLOSE.

01 20 36 18 CDR CLOSE.

01 20 36 19 LMP PRESS REG A, CLOSE.

01 20 36 21 CDR PRESS REG A, going CLOSED.

01 20 36 25 LMP PRESS REG B, DIRECT O<sub>2</sub>.

01 20 36 27 CDR DIRECT O<sub>2</sub>. Okay, you ready?

01 20 36 29 LMP Ready.

01 20 36 59 CDR How you feeling? Okay? Alrighty. If you start feeling ragged, give me a holler and I'll just let you rest.

01 20 37 31 LMP Okay, you want to go to CLOSE, when we get to 8.85.

01 20 37 35 CDR I can't see it very well.

01 20 37 36 LMP Okay, I'll - I'll let you know. We're at 8 now.

01 20 37 40 CDR Okay.

01 20 37 53 LMP Okay, that's 8.85, essentially.

01 20 37 57 CDR Alrighty, CLOSE.

01 20 37 59 LMP Okay, the timer is counting. I'm reading 4.01, or something like that.

01 20 38 06 CDR I'm 4.05.

01 20 38 08 LMP Okay.

01 20 38 15 LMP ... a minute we want to read it again. Should be less than 0.3. And you want to go - CO<sub>2</sub> CANISTER to SECONDARY, right away.

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Day 2 - Page 9  
Tape 09-03601

01 20 38 31 CDR Okay.

01 20 38 35 LMP Boy, my throat is really dry.

01 20 38 37 CDR Yes, mine too. I'd sure like to get some water and something to eat.

01 20 38 40 LMP I don't know if I'm hungry or not.

01 20 38 41 CDR Yes, my stomach is just dead ...

01 20 38 45 LMP Okay, I'm reading 3.95.

01 20 38 49 CDR Yes, me too.

01 20 38 50 LMP Okay, you got about 5 more seconds. 5, 4, 3, 2, 1 -

01 20 38 57 LMP Go to SECONDARY.

01 20 38 59 CDR SECONDARY.

01 20 39 01 LMP Okay, and it's reading 3.75 now.

01 20 39 04 CDR Yes.

01 20 39 05 LMP And we'll time that.

01 20 39 12 CDR It felt nice and cool over here in the LM when I came over - with my helmet off.

01 20 39 25 LMP The temp is 68. Another 30 seconds.

01 20 39 36 LMP That's going to make it, too.

01 20 39 49 LMP ... seconds.

01 20 39 50 CDR Okay.

01 20 39 54 LMP And at that point, let me tell you what you're going to do.

01 20 40 01 CDR Okay, time's up.

01 20 40 03 LMP Okay, and it made it. CO<sub>2</sub> CANISTERS, SELECT, PRIME.

01 20 40 09 CDR PRIME.

01 20 40 11 LMP ... lights, OFF. SUIT CIRCUIT RELIEF to AUTO.

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01 20 40 15 CDR SUIT CIRCUIT RELIEF to AUTO.

01 20 40 17 LMP PRESS REGS A and B to CABIN.

01 20 40 21 CDR PRESS REGS A and B to CABIN.

01 20 40 24 LMP CABIN GAS RETURN to AUTO.

01 20 40 26 CDR CABIN GAS RETURN to AUTO.

01 20 40 32 LMP And SUIT GAS DIVERTER, PUSH to CABIN.

01 20 40 35 CDR Okay. Ready?

01 20 40 36 LMP Ready. Wow! That's like, now.

01 20 40 43 CDR Yes.

01 20 40 45 LMP SUIT CONTROL - Okay, I'd better get out a pen here. That's in FULL COLD on the SUIT and NORMAL on the CABIN.

01 20 40 55 CDR FULL COLD on the SUIT, let's see this - -

01 20 40 58 LMP No, that's where it is; I'm - -

01 20 40 59 CDR Oh. Okay.

01 20 41 00 LMP - - not asking you to put it there.

01 20 41 32 LMP Okay, regulator check is next. Let me see what - -

01 20 41 36 CDR Yes, we have about 12 minutes. Why don't we configure the S-band so that we're ready to support that thing? And then come back and we'll start the REG checks and stuff like that. We can pick these up later.

01 20 41 54 CDR Okay. As a matter of fact, if we don't have to use this card anymore - -

01 20 41 59 LMP ... have any steerable antennas, so he wanted the backup voice, okay?

01 20 42 03 CDR He what? I thought they wanted secondary S-band check at Antigua on the flight plan? Right here.

01 20 42 20 LMP ... the secondary S-band checks.

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Tape 09-03601

01 20 42 21 CDR Yes.

01 20 42 24 LMP Okay. We'll be ready to pick them up.

01 20 42 29 CDR Okay. Very good. Clip, hot dog. Alright, and we're - -

01 20 42 37 LMP Why don't we do the ascent battery activation and checkout, right now?

01 20 42 41 CDR Yes, we just did the pressure integrity check.

01 20 42 43 LMP Yes, we can catch that regulator check some other time.

01 20 42 45 CDR Yes.

01 20 42 56 CDR Let's see, that's the thing we have the new checksheet for, isn't it?

01 20 43 00 LMP Yes, I know what it is, if you want me to just go ahead and do it.

01 20 43 03 CDR Okay. Why don't you.

01 20 43 05 LMP Okay. DESCENT ECA CONTROL, CLOSED. Excuse me, ASCENT ECA CONTROL, CLOSED.

01 20 43 10 CDR Yes, here it is - here it is here - ASCENT ECA CONTROL, CLOSED; PYRO TEMP MONITOR, BAT 5.

01 20 43 15 LMP Okay, 5.

01 20 43 16 CDR BAT 5, NORMAL FEED, ON - -

01 20 43 17 LMP Hey, how about turning up the EL? Okay. Thank you. Okay, 5 coming on.

01 20 43 33 CDR What in heaven's name is that?

01 20 43 35 LMP It's on. Going to 6. 6 is ON. Okay, now - 1, 2, 3, 4, OFF. Right?

01 20 43 45 CDR Right, yes.

01 20 43 49 LMP Okay, 1, OFF.

01 20 43 53 LMP 2 going OFF.

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01 20 43 57 LMP 3 going OFF.

01 20 44 02 LMP 4 going OFF.

01 20 44 03 CDR And the current should be zero.

01 20 44 10 LMP Okay, let me look at BATS 5 and 6. 5 is reading 27; 6 is reading 24. ... pretty good. Okay, now we go to BACKUP FEEDS, right?

01 20 44 19 CDR Yes, BACKUP FEEDS, both, ON.

01 20 44 31 LMP PRIMARY FEEDS, OFF.

01 20 44 32 CDR PRIMARY FEEDS, both, OFF; RESET.

01 20 44 42 LMP Okay, looks the same.

01 20 44 47 LMP ... back ON.

01 20 44 49 CDR Roger. BATS coming back ON, then.

01 20 44 50 LMP ON - -

01 20 44 51 CDR Go ahead, Gumdrops.

01 20 44 53 CMP Okay, the hatch is closed up; the probe works real good; the hatch works good. I'll just put the tunnel in DELTA-T, unless you want to run it in LM PRESS.

01 20 45 03 CDR We're pressurizing ourselves over here now, Dave. Hey, were you getting a lot of noise on VHF, then?

01 20 45 11 CMP No, but I seem to have a lot of noise - flow noise in here now.

01 20 45 17 CDR Okay, I was getting an awful lot of static all of a sudden there.

01 20 45 24 CDR Okay, when you get all those back on, Rusty.

01 20 45 26 LMP A is 36.8. ... 37.5.

01 20 45 34 CDR What's that? Oh - -

01 20 45 35 LMP PYRO A - -

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Day 2 - Page 13  
Tape 09-03601

01 20 45 36 CDR PYRO B.  
01 20 45 37 LMP - - and B.  
01 20 45 38 CDR Okay. Say that again. I'll write it down.  
01 20 45 39 LMP Okay, I'll get it here.  
01 20 45 41 CDR What is it? I got the pencil here, Rusty.  
01 20 45 43 LMP 36.8, 37.5. ... going to take this one back in now.  
01 20 45 48 CDR Okay.  
01 20 45 54 CDR Alrighty. We got that done.  
01 20 45 59 CDR Daylight AOT star visibility check. Oh, we're not going to get that done. I wonder what it looks like out through there?  
01 20 46 07 CMP Okay, Jim, you want to vent the tunnel, or do you want to leave it full?  
01 20 46 19 CDR It doesn't make any difference, Dave, I don't think.  
01 20 46 24 LMP Well, when we make our REG checks - -  
01 20 46 25 CDR Yes - -  
01 20 46 26 CMP ... hatch the ... check is to vent the tunnel.  
01 20 46 28 CDR Okay, why don't you go ahead and vent it?  
01 20 46 29 CMP Okay, we'll see how it works.  
01 20 46 31 LMP Are you going to suggest whether - -  
01 20 46 32 CMP Is your dump valve in AUTO?  
01 20 46 34 CDR Roger, we're all configured.  
01 20 46 36 CMP Okay.  
01 20 46 41 LMP Okay, we pick up the Antigua at 53, right?  
01 20 46 44 CDR Roger.

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Day 2 - Page 14  
Tape 09-03601

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01 20 46 45 LMP We have 7 minutes. Let's do something useful.  
You want to start that REG check?

01 20 46 50 CDR What the hell is that out there ... the tunnel.  
Well - -

01 20 47 04 LMP I don't know. That REG check takes us up and down  
here.

01 20 47 05 CDR Yes.

01 20 47 09 CDR Stay in BACKUP VOICE; S-band steerable antenna  
check - we don't need that.

01 20 47 20 CDR We've done the glycol pump check, haven't we?

01 20 47 23 LMP Yes.

01 20 47 24 CDR ..., get that checked off.

01 20 47 26 CDR We have the window shades on yet? Drogues and  
probe installation, OPS check and LM OVERHEAD HATCH,  
CLOSED; we've done that. Done that.

01 20 47 51 CDR Let's just stand by until we get to Antigua.

01 20 47 54 LMP Why don't you look ahead of that, Jim; and see  
what we can do?

01 20 47 57 CDR Well, we got to get the PLSS out. Get the PLSS  
PREP, install the ISA. Wonder where we install  
that?

01 20 48 08 LMP Hey, stow the - stow the OPS.

01 20 48 11 CDR Oh, yes, that's what we didn't do.

01 20 48 13 LMP Yes. And get these helmets out of here. That's  
what - that's something we can do. Tell you, I  
wish I could help you, but I don't - -

01 20 48 20 CDR Yes, that's okay. You can help me more by just  
being able to continue reading the checklist.  
... straps that go - around this thing here. For  
the - -

01 20 54 17 LMP Tape, ON - - Okay, tape, we're doing the secondary  
S-band check. And it's - 44:54:20.

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Day 2 - Page 15  
Tape 09-03601

01 20 54 23 CMP And, Houston, Gumdrops. Tunnel's closed out, and everything works just like it should.

01 20 54 32 CC Roger, Gumdrops; thank you.

01 20 54 41 LMP And Houston, this is Spider. How do you read?

01 20 54 44 CC We're reading you loud and clear, Spider. We had a data dropout here, let's hang loose; see if we can get a data check back.

01 20 54 58 CDR Roger.

01 20 54 59 LMP I could hear your data dropout.

01 20 55 02 CC Very good.

01 20 55 13 CC And Spider, this is Houston. Could you give us HIGH bit rate?

01 20 55 17 LMP Roger; going HIGH.

01 20 55 36 CC Spider, we'll have to hang loose here for a minute. I'm getting you VHF now, we don't have a good lock on S-band.

01 20 55 43 LMP Roger.

01 20 55 48 CC And, while we're waiting, could you comment on if you accomplished these - with the exception of the COMM checks, are you up on the flight plan, now?

01 20 55 59 LMP We got the glycol check done and a suit integrity check done. We have not accomplished the regulator check or the rest of the COMM or the daylight star visibility.

01 20 56 11 CC Okay, we're scrubbing the daylight star visibility and the COMM checks. How about the ascent battery?

01 20 56 18 LMP Roger. The ascent batteries checked out okay, and the pyros. You ready to copy?

01 20 56 22 CC Go ahead.

01 20 56 23 LMP Roger; 36.8, 37.5, A and B.

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01 20 56 27 CC Roger. Copy 36.8 and 37.5. Thank you.

01 20 56 32 LMP Roger.

01 20 56 40 LMP And for your information, the ascent batteries were sharing just about equally.

01 20 56 45 CC Roger. Understand.

01 20 56 54 CC And Spider, we have got a data check. Let's go on with the secondary S-band check. Step 2.

01 20 57 02 LMP Roger. POWER AMP going to SECONDARY.

01 20 57 09 CC Roger.

01 20 57 21 LMP Okay, and we're on secondary transmitter/receiver. How do you read?

01 20 57 26 CC Roger. I'm reading you loud and clear; let me verify that it is S-band, Spider.

01 20 57 30 LMP Okay.

01 20 57 33 LMP You want me to lift that, Jim?

01 20 57 34 CDR No. I can get it out, I think.

01 20 58 18 LMP Roger.

01 20 58 45 LMP And, Houston. We're back in PRIMARY/PRIMARY. And be advised on the primary transmitter/receiver, I've got a squeal.

01 20 58 55 CC Roger. Understand, you're PRIMARY/PRIMARY, and there is a - there is a squeal - You're coming through loud and clear here without any static at all. Let's stand by for a data; I'll give you a call.

01 20 59 06 LMP Roger.

01 20 59 08 CC And, Spider, also we'd like to, at your convenience, get an E-memory dump in here. It's a little ahead of schedule, but we'd like to get it now, so you can give us a VERB 74 sometime on your mark.

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Day 2 - Page 17  
Tape 09-03601

01 20 59 19 LMP Roger. Stand by.

01 20 59 29 LMP Okay, - 3, 2, 1 -

01 20 59 32 LMP MARK.

01 20 59 38 CC Roger. We - we got your - we got your mark, you want to stand by and see if we got it. We might have you repeat it again, shortly. And let me see if we're through with this check.

01 20 59 58 CC And, Spider, this is Houston. ... completed your secondary S-band check tests?

01 21 00 03 LMP Roger.

01 21 00 15 CC And Spider. If you've still got the squeal on PRIMARY let's go SECONDARY on your TRANSMITTER/RECEIVER.

01 21 00 22 LMP Roger, it's gone away now; we'll see how it works.

01 21 00 27 CC Okay. Thank you.

01 21 00 33 CDR Phewee!

01 21 00 41 LMP ... work back there, isn't it?

01 21 00 42 CDR Oh, boy. This thing doesn't fit, Rusty. This God-blessed netting is all screwed up. Oh, I almost broke by God-blessed finger off. Now I got it out; I'm never going to get it back in there.

01 21 01 04 LMP ... netting?

01 21 01 05 CDR No, no, that's one - Oh, boy, the guy that sent that piece of machinery up ought to get his God-blessed head caved in. It simply no more fits than the man in the moon. I can't even push that handle back and forth without the thing being in there. I get all fouled up in there. The trouble is, if I leave it like that and get a little vibration, that mother's going to shake loose.

01 21 01 52 CDR Oh, hell's bells. All I got to do is touch it, and it comes right out. Will my feet bash anything they shouldn't?

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Day 2 - Page 18  
Tape 09-03601

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01 21 02 00 LMP No, you're sticking them in the guards; that's okay. I'll keep them away from the controllers.

01 21 02 07 CC Gumdrops, this is Houston. We'll have you now for about another 12 minutes.

01 21 02 13 CMP Gumdrops; Roger.

01 21 02 17 LMP Roger.

01 21 02 25 CDR Oh, boy. Phew! Phew!

01 21 02 31 LMP Don't overdo it.

01 21 02 33 CDR Yes. Well, Rusty, I don't know what the heck else I can do with that thing.

01 21 02 39 LMP Oh, boy.

01 21 02 45 LMP ... handle won't turn, huh?

01 21 02 46 CDR No, I can't push it in.

01 21 02 47 LMP Oh, my God, we got an OPS floating up here. I got to let go of something and grab it.

01 21 02 53 CDR I'll - -

01 21 02 54 LMP I got it.

01 21 03 01 CDR I don't know where that strap is either. This is really neat.

01 21 03 05 LMP ... use a bunch of these.

01 21 03 06 CDR I tried the other one here. And I had it strapped on one time; it just got out, that's all. It doesn't fit, you know, and - -

01 21 03 15 LMP That's why I say use these, because you can adjust them a lot better.

01 21 03 17 CDR Well, the other one was adjusted pretty well.

01 21 03 30 CDR The strap's still there.

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Day 2 - Page 19  
Tape 09-03601

01 21 03 44 CDR Ohhhh. Well, I'll just - I'll just put it through one of these other snaps on here.

01 21 04 45 CDR Okay, there, that's strapped down.

01 21 04 46 CC ... Houston. We'd like to know when you're going to deploy the landing gear. We'd like to have a mark on it, and we'd like to get it before we lose you at Madrid in about 8 minutes, if possible.

01 21 04 57 LMP Roger. We'll make - we'll put that in work right away. It'll be pretty close to the end.

01 21 05 04 CC Okay. Understand.

01 21 05 07 CDR Okay, let me get the camera.

01 21 05 08 LMP Okay.

01 21 05 09 CDR What do we need? We need the 5-millimeter lens, don't we?

01 21 05 12 LMP No, 18 - -

01 21 05 13 CDR No, the 18-millimeter lens, don't we?

01 21 05 14 LMP I'm ... my gloves off, Jim.

01 21 05 15 CDR Go ahead.

01 21 05 20 CDR ... This is indoor, too. Shoot, we're - we're really well equipped.

01 21 05 58 CDR Okay, Rusty, here's the camera. Let me get the film.

01 21 06 03 LMP Okay. Stand by. I'll be right with you, Jim.

01 21 06 07 CDR Okay.

01 21 06 10 LMP Okay, I got it.

01 21 06 19 LMP What are you looking for, Jim?

01 21 06 20 CDR The film.

01 21 06 24 LMP Didn't we transfer one?

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Day 2 - Page 20  
Tape 09-03601

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01 21 06 25 CDR No, we brought an indoor one over with us.

01 21 06 31 LMP Okay, you got it?

01 21 06 43 CDR Oh, shoot. How do we unseal this thing? Oh, there we go. Well, S comes before T, let's try that.

01 21 07 08 CDR Hey -

01 21 07 43 CDR Oh! Something else won't lock.

01 21 07 50 LMP ... you're really bashing things.

01 21 07 52 CDR Yes, I know it. Especially my helmet. There it is.

01 21 08 06 LMP You got it?

01 21 08 07 CDR Yes.

01 21 08 20 LMP Hello, world.

01 21 08 21 CDR Hey, Gumdrop, this is Spider. We're going to deploy the landing gear in a few minutes here, so you'll probably feel a big bang.

01 21 08 27 CMP Okay, Jimmy ...

01 21 08 31 CDR Roger.

01 21 08 32 LMP Shoot.

01 21 08 38 CDR Okay, where is that?

01 21 08 39 LMP Ahhhh, come on.

01 21 08 41 CMP Shut up that and give me a minute, will you?

01 21 08 51 CDR LANDING GEAR DEPLOY.

01 21 08 52 CC ... Spider ... and stand by ... We'll be going over Madrid shortly.

01 21 08 57 CDR Okay, how long do we - we have before we - you want the gear down?

01 21 09 01 CC We're ready any time.

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Day 2 - Page 21  
Tape 09-03601

01 21 09 04 CDR Yes, how long do we have?

01 21 09 07 CC Okay, you've got about another 5 minutes before we'll lose you at Madrid.

01 21 09 11 CDR Okay.

01 21 09 14 LMP We'll be ready.

01 21 09 20 CDR Unstow, adjust, and lock the sequence camera above the right window. 18-millimeter lens; CEX368 MAG; 24 frames per second; f:4 - 11 - f:11 at 1/250th; 20 feet. CB(11): ED LOGIC POWER A, OPEN. LOGIC POWER A, OPEN. R&D INSTRUMENTATION A, CLOSE. DFI POWER, ON.

01 21 09 49 LMP Oh, hell, I can't tell my frame speed, hold on.

01 21 09 52 CDR DFI POWER's coming ON, Rusty.

01 21 09 57 LMP Okay.

01 21 10 19 LMP Okay, the camera's ready.

01 21 10 21 CDR Okay.

01 21 10 22 CC Spider, for your info, we - DFI, we cannot read at Madrid, so we've only got about another minute here on Canaries. ... monitor that?

01 21 10 31 LMP Okay, you ready?

01 21 10 32 CDR Yes. Okay, Dave, we are going to do it very quickly.

01 21 10 37 CMP Okay.

01 21 10 39 CDR DFI POWER, ON; MASTER ARM coming ON.

01 21 10 42 LMP Did you get the LOGIC A, OPEN?

01 21 10 43 CDR LOGIC A is OPEN.

01 21 10 45 LMP Okay, MASTER ARM, ON; SEQUENCE CAMERA, CLOSED, I got that.

01 21 10 48 CDR Okay.

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Day 2 - Page 22  
Tape 09-03601

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01 21 10 49 LMP Okay, you can give him a count, Jim, if you want. I've got the camera ready.

01 21 10 53 CDR Okay - Put this around.

01 21 10 57 LMP He has to - Why don't you watch it, too.

01 21 10 59 CDR Yes, I'm going to. LANDING GEAR DEPLOY. Okay, Houston, this is Spider. Are you ready? Houston, Spider. Do you read? Houston to Spider - -

01 21 11 12 LMP Hey, he's talking, Jim.

01 21 11 14 CDR Okay, Houston, Spider here. 3, 2, 1 -

01 21 11 17 CDR MARK.

01 21 11 24 LMP ...

01 21 11 25 CDR Okay, Houston. I've got a gray ... talkback, and I've got a gear out in front of me. I don't hear them. Hope they're on.

01 21 11 34 LMP Sure do. Okay, the camera's OFF; LANDING GEAR DEPLOY, FIRE; SEQUENCE CAMERA, OFF; GET is 45:11:35.

01 21 11 44 CDR GO.

01 21 11 45 CC Okay, I think we copied you. They were listening when you said the 3, 2, 1; then I got a broke - a breaklock just after you gave the indication.

01 21 11 52 CDR Okay.

01 21 11 53 CMP I got one out here too, so that snapped right on down there.

01 21 11 55 CDR Okay. Okay, we've got to finish out that sequence.

01 21 11 58 LMP Yes, Roger. I'm going. Okay, ED LOGIC B coming OPEN. OPEN.

01 21 12 07 CDR Okay.

01 21 12 10 LMP A, CLOSED.

01 21 12 11 CDR A, CLOSED.

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Day 2 - Page 23  
Tape 09-03601

01 21 12 13 LMP LANDING GEAR DEPLOY, FIRE.

01 21 12 16 CDR Okay, Dave, I'm going to do it with the other pyro system now; you may hear a little bump. Okay, 3, 2, 1 -

01 21 12 23 CDR FIRE.

01 21 12 25 LMP Okay, ED LOGIC B, CLOSED.

01 21 12 27 CDR Okay.

01 21 12 28 LMP MASTER ARM, OFF.

01 21 12 29 CMP By the way, can you see me out your ... window?

01 21 12 32 CDR Dave, I haven't had a chance to even look.

01 21 12 34 CMP ...

01 21 12 37 LMP Okay, LOGIC B, CLOSED. I got MASTER ARM, OFF; LANDING GEAR FLAG, circuit breaker, Jim, OPEN. ED 11.

01 21 12 45 CDR Okay.

01 21 12 48 LMP R&D TELEMETRY CAL, ON. Why don't you try that real quick?

01 21 12 51 CDR Yes. Okay.

01 21 12 55 LMP ... going LOW bit rate, and we're going to CAL right now.

01 21 12 59 CC Roger. Understand. And we'll see you over Carnarvon at 39.

01 21 13 03 CDR Okay, did you get that - the gear extension, Houston?

01 21 13 07 CC That's affirmative, Spider. It came through loud and clear. We're showing the relays closed; and I thought you'd like to transmit.

01 21 13 13 CDR Thanks, Dave.

01 21 13 17 CMP Roger.

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Day 2 - Page 24  
Tape 09-03601

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01 21 13 19 CDR Okay, DFI - TELEMETRY CAL, OFF. That DFI POWER OFF now?

01 21 13 27 LMP DFI, OFF; R&D A, OFF.

01 21 13 32 CDR DFI POWER, OFF; and R&D INSTRUMENT A, OFF?

01 21 13 34 LMP Right.

01 21 13 35 CDR Okay.

01 21 13 38 LMP ... on S-band, Jim, and you didn't hear them answer you.

01 21 13 40 CDR Yes.

01 21 13 44 LMP Okay, PLSS prep.

01 21 13 50 CDR Let me get the rest of this floor squared away.

01 21 14 02 LMP ... a view and a half out the window, isn't it?

01 21 14 04 CDR Yes, you got a real - picture window there.

01 21 14 14 CDR Watch your feet, Rusty.

01 21 14 29 CDR Oh, I haven't found anything in this God-blessed thing that fits yet.

01 21 14 59 CDR Okay, those aren't exactly flush, but they're down pretty well.

01 21 15 13 CDR Just a second, Rusty, I'll be right with you. Shoot, come on water gun.

01 21 15 30 CDR You alright, there? Okay. If you're in any - if you're in any trouble, wiggle your head, if you're not, just - okay? You want me to wipe your mouth off, if -

01 21 15 45 LMP Yes.

01 21 15 46 CDR - How about your nose here?

01 21 16 33 LMP Okay.

01 21 16 42 CMP Spider, I've been unable to reach you ...

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Day 2 - Page 25  
Tape 09-03601

01 21 16 51 CDR Yes, that's okay, Dave. Okay?

01 21 16 59 LMP Yes.

01 21 17 01 CDR I'll get you my other chin strap here in a minute, this one of yours is kind of beat up. Here, I'll tell you what. If you - if you want to use this, I'll go down and get a - a clean towel, and I'll put some cold water on it for you, okay?

01 21 17 15 LMP Okay. (clearing throat)

01 21 17 21 CDR If I remember where the heck they were.

01 21 17 39 LMP I sure feel a lot better afterwards.

01 21 18 12 LMP Sorry.

01 21 18 13 CDR That's okay, Rusty. Everybody has a problem. I think though, we're going to have to talk to Houston, and tell them what ours is. And - -

01 21 18 21 LMP Yes. (clearing throat)

01 21 18 22 CDR - - I think we ought to - seriously consider - as a matter of fact, I'm going to recommend we scrub the EVA tomorrow.

01 21 18 27 LMP Yes, I think that's a good idea.

01 21 18 29 CDR I know how you want to do it, I think - maybe we'll - let you stay back in the command module with Dave, and I'll come over here, and we'll run through the checklist, open up the cabin. Don't sweat it though.

01 21 18 51 LMP Why don't you go ahead and take your gloves off?  
(clearing throat)

01 21 18 56 CDR Here. How's that? Does that help, or is that just making you - -

01 21 19 02 LMP No, that's okay. Don't shake me too much, though.

01 21 19 04 CDR Okay.

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Day 2 - Page 26  
Tape 09-03601

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01 21 19 06 LMP Because I've got something in my hand here I don't want to let go of.

01 21 19 08 CDR Yes. Let me - let me use this for just a minute.

01 21 19 36 CDR Hey, Dave?

01 21 19 39 CMP Go ahead.

01 21 19 40 CDR What's the next time we get acquisition at the ground?

01 21 19 43 CMP ...

01 21 19 50 LMP I don't know how we're going to clean this up now.

01 21 19 52 CDR Well, we'll - figure something.

01 21 19 58 CMP About 45 ... which is 20 minutes from now ...

01 21 20 03 CDR Okay, I guess nobody's listening. Hey, Rusty got sick again, I think - I'm going to have to call Houston; we're going to have to have a little discussion about this. I think we're going to have to scrub the EVA for tomorrow for sure. But I think we probably ought to try to at least do the CABIN DEPRESS. We might want to do it at the end of today, and then just take tomorrow off.

01 21 20 21 CMP Yes, that might not be a bad idea.

01 21 20 37 CDR Too bad we don't have that - -

01 21 20 38 CMP ...

01 21 20 41 CDR No, not at all. Thank you.

01 21 20 43 CMP Okay.

01 21 20 47 CDR I wonder if - Let's see, we have a tissue dispenser in here someplace.

01 21 21 02 CDR Dave, as soon as we get contact with Houston, tell them I want to go PRIVATE with them.

01 21 21 06 CMP ...

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Day 2 - Page 27  
Tape 09-03601

01 21 21 08 CDR No, I'm going to be - I'll probably not be talking much here for a couple of minutes.

01 21 21 12 CMP Okay, I'll let Houston know ... get squared away.

01 21 21 47 CDR How's your stomach feeling? Is it feeling any better?

01 21 21 49 LMP No, it feels fine now.

01 21 21 50 CDR You want me to undo your chin strap for you there?

01 21 21 52 LMP Yes.

01 21 21 53 CDR I'll just - I'm sorry, I'm going to have to gouge you a little bit there.

01 21 22 00 LMP Well, do you want to let it float or do you want to - -

01 21 22 06 CDR I'd get that Kleenex for you, if I knew where it was. It's over on your side, someplace up there.

01 21 22 47 LMP (clearing his throat). Now we got to stow this stuff somewhere.

01 21 22 52 CDR Yes, I know it. I'll be with you in just a minute, Rusty.

01 21 23 25 LMP That's really funny, Jim. Because both cases there, it's not because I'm moving; I can feel it way down in my stomach.

01 21 23 33 CDR Uh huh.

01 21 23 34 LMP It feels like there is something that I ate - -

01 21 23 37 CDR Well - -

01 21 23 38 LMP - - or something I took.

01 21 23 39 CDR Yes.

01 21 23 40 LMP One or the other.

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01 21 23 42 CDR ... my stomach's been gurgling an awful lot, too. I think it's from that water.

01 21 23 46 LMP Well, I'm worried about that - I'm still wondering about that bacon. It might be the water, too. I don't know.

01 21 23 51 CDR Let's see, we got to do something with that. Tell you what.

01 21 24 01 LMP With what?

01 21 24 02 CDR With that - stuff you have in your hands there.

01 21 25 05 LMP Hey, great.

01 21 25 10 CDR Oh, shoot. It's not very big, Rusty.

01 21 25 13 LMP What is it?

01 21 25 14 CDR It's the bag that the water gun was in.

01 21 25 47 CDR That's a pretty clean one. I'll just stow this.

01 21 25 56 LMP (clearing throat)

01 21 26 24 CDR Thank you.

01 21 26 26 LMP I don't know where your clip went.

01 21 26 27 CDR That's okay. It's around somewhere. Why don't you just get comfortable, there, and don't do anything.

01 21 26 35 LMP Hell, I'm feeling good, Jim.

01 21 26 36 CDR Okay. Well, why don't you just rest for awhile, and not - not bother doing anything. I think we'll scrub most of these COMA checks here - a few of them until we get organized here.

01 21 26 43 LMP Hey, no, no I'm - I'm serious - -

01 21 26 45 CDR Well, we're going to have to get the PLSS out.

01 21 26 48 LMP Right, let's go ahead and do that. Let me get - let me clean off my chin strap here.

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Day 2 - Page 29  
Tape 09-03601

01 21 26 52 CDR Yes, I've got another one with me, I think.

01 21 26 58 LMP Oh, that might be good. This one's kind of wet and soggy.

01 21 27 00 CDR Yes, let me get it ...

01 21 27 35 CDR There it is, back there. And there's the other one. Excuse me.

01 21 27 59 LMP Am I fairly well cleaned up?

01 21 28 01 CDR Yes, you look pretty good.

01 21 28 06 LMP (Clearing throat)

01 21 28 21 CDR Alrighty. Let me finish what I was doing, and get these helmet bags out of here.

01 21 28 34 LMP Okay, I'm going to look ahead, here. Alright, the next thing is the PLSS COMM check with the LM. I mean - yes.

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DAY 3

02 01 33 43 LMP I got the tape on now.

02 01 33 44 CDR DFI POWER, ON.

02 01 33 48 LMP And the radar is reading 81 degrees.

02 01 33 51 CDR Okay. Our steady-state limits are 10 degrees per second, or 10 degrees and 5 degrees per second.

02 01 34 02 LMP ... 6 minutes we're going to get the PROP QUANTITY MONITOR, ON - -

02 01 34 05 CDR Okay.

02 01 34 06 LMP - - DESCENT 1 and 2.

02 01 34 10 CDR Okay, Gumdrop. It looks like our attitude's about right, looking out the window here at the ground.

02 01 34 14 CMP Roger, it looks about right to me, too.

02 01 34 18 CDR It's only 1800 feet per second; it's about right - It's good enough, huh?

02 01 34 23 CMP 15 minutes ...

02 01 34 27 LMP ... 5 degrees, too.

02 01 34 29 CDR Great. Let's see. Ooh, look at that.

02 01 34 37 LMP How about that. Everything's in agreement. For some unu - unknown reason.

02 01 34 46 CDR Boy, it's going to be brighter than hell in here.

02 01 34 53 LMP Yes, you're right. It sure is.

02 01 34 58 CDR Is your light up there - strongly?

02 01 35 00 LMP Yes, it's strong.

02 01 35 06 CDR I guess it got to launch, didn't it? No, it wasn't going to.

02 01 35 10 LMP No, uh huh. Don't move it back too far because I want to be able to see the thing.

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Day 3 - Page 31  
Tape 09-03601

02 01 35 13 CDR Okay.

02 01 35 32 LMP Okay, believe it or not - we're going to switch inverters, here.

02 01 35 36 CDR Oh, Jeez.

02 01 35 38 LMP PROP QUANTITY MONITOR, DESCENT 1 and 2.

02 01 35 40 CDR DESCENT 1.

02 01 35 42 LMP Okay.

02 01 35 44 CDR Lights work, DESCENT 2, okay.

02 01 35 47 LMP Okay, you're in DESCENT 2.

02 01 35 48 CDR Yes.

02 01 35 49 LMP Okay, CB(11), EPS, INVERTER 1, CLOSE.

02 01 35 52 CDR INVERTER 1, CLOSE.

02 01 35 53 LMP Okay, and I'm going to INVERTER 1 over here.

02 01 35 55 CDR Okay.

02 01 35 58 LMP ... INVERTER 1.

02 01 35 59 CDR How are the buses looking?

02 01 36 01 LMP Oh, I can't tell here. Hold on, I'm going to - -

02 01 36 03 CDR Okay.

02 01 36 04 LMP - - OPEN. The buses look okay. ... CLOSE to OPEN. Okay, commander's bus is at 29, systems engineer is at 30.3.

02 01 36 14 CDR Good. Okay.

02 01 36 19 LMP Okay, 4 minutes, TTCA throttling up.

02 01 36 24 CDR Okay.

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02 01 36 25 LMP Okay, we might as well wait here.

02 01 36 27 CDR Throttle, up, and on we go.

02 01 36 29 LMP THROTTLE CONTROL to MANUAL.

02 01 36 31 CDR THROTTLE CONTROL to MANUAL.

02 01 36 32 LMP MANUAL THROTTLE to COMMANDER.

02 01 36 33 CDR COMMANDER.

02 01 36 35 LMP Verify your throttle now, by moving it.

02 01 36 40 CC Spider, Houston.

02 01 36 41 LMP Oh, you got to - you got to have the engine armed, I guess.

02 01 36 43 CDR Yes. Go ahead, Houston; Spider.

02 01 36 47 CC Roger, we're showing the AGS address 407 as 10 000. Revise the checklist as 0 - 000.

02 01 37 05 LMP Roger. Thank you.

02 01 37 07 CC And you're welcome.

02 01 37 10 LMP This damn thing - -

02 01 37 11 CDR There's Baja California. We ought to be just about over Houston, when we do this.

02 01 37 16 LMP Yes. Okay - ... REMOTE CONTROL, AUTO.

02 01 37 27 CDR REMOTE CONTROL, AUTO.

02 01 37 29 LMP Okay, now we'll wait and arm the descent engine here.

02 01 37 31 CDR Yes. Okay, it's 4 minutes now.

02 01 37 35 LMP Hey, there's a village down there. Coming up, it's going to go across the Z-axis in just a second.

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Day 3 - Page 33  
Tape 09-03601

02 01 37 42 CDR There's snow on the mountains down there. Okay,  
let's do ENGINE ARM to DESCENT, here.

02 01 37 51 LMP ... ARM, DESCENT.

02 01 37 52 CDR ENGINE ARM, DESCENT; verify that, okay.

02 01 37 55 LMP You didn't get the ... warning light.

02 01 37 57 CDR No.

02 01 37 58 LMP X-TRANSLATION to 2 JETS.

02 01 37 59 CDR 2 JETS.

02 01 38 00 LMP BALANCE COUPLES, ON.

02 01 38 01 CDR BALANCE COUPLES, ON.

02 01 38 02 LMP ENGINE GIMBAL, ENABLE.

02 01 38 03 CDR ENABLE.

02 01 38 04 LMP PROP QUANTITY MONITOR - PROP TEMP/PRESS MONITOR,  
rather.

02 01 38 09 CDR DESCENT 1.

02 01 38 10 LMP Okay.

02 01 38 12 CDR Here I am.

02 01 38 13 LMP HELIUM MONITORS, SUPERCRIT PRESS.

02 01 38 18 CDR SUPERCRIT PRESS. CAMERA SEQUENCE, CLOSE.

02 01 38 21 LMP Okay, I've got the CAM - the SEQUENCE CAMERA  
breaker closed.

02 01 38 24 CDR Okay, MASTER ARM's CLOS - -

02 01 38 25 CC Spider, Houston.

02 01 38 27 CDR Go.

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02 01 38 28 CC Okay, Rusty, that 407 slipped to 10 000 again; we're recommending that you set 08.

02 01 38 42 LMP I'll just hit it to zero ... I didn't hear what he said, but - -

02 01 38 45 CDR Yes, Houston, you cut off there; say again.

02 01 38 49 CC Roger, your ... has not dropped back to 10 000; we're recommending you set up 0000 and end right around ignition time.

02 01 39 01 CDR Roger. Okay, now I can check my mo - my throttle. It's throttling. Okay, let's continue.

02 01 39 10 LMP Okay, is the MASTER ARM, ON?

02 01 39 11 CDR MASTER ARM's ON.

02 01 39 12 LMP Okay, stand by for 2 minutes.

02 01 39 15 CDR Let's see, turn THROTTLE CONTROL to AUTO. We don't have that yet.

02 01 39 19 LMP Yes, THROTTLE CONTROL, AUTO. Good. Thank you.

02 01 39 22 CDR Okay.

02 01 39 23 LMP God, is that going to be bright!

02 01 39 24 CDR It sure is. Hooee.

02 01 39 27 LMP Hmna.

02 01 39 28 CDR We're really oscillating around here in yaw. At 5 degrees. Okay. 2 minutes, verify the AGS attitude errors. ... 0. Okay? Go.

02 01 39 48 LMP ... reads 17:43.

02 01 39 51 CDR ... in 45 seconds, Gumdrop.

02 01 39 54 CMP Roger, I'm with you.

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02 01 39 57 LMP Standing by for 15 seconds; SEQUENCE CAMERA, ON, will be then. Begin ullage at 10; PROCEED at 5; ignition and then you're going to - -

02 01 40 07 CDR Going to try to get - -

02 01 40 08 LMP - - turn the MASTER ARM, OFF.

02 01 40 09 CDR Yes.

02 01 40 10 LMP Or try too. Then you're going to throttle up at 5 seconds after - -

02 01 40 16 CDR Going to throttle up at 46 - 40 percent. Man, that is really bright. Alright, Houston. We're right over a white deck of clouds, and is it ever bright.

02 01 40 28 CC Roger. Copy, Spider.

02 01 40 35 CDR 1 minute.

02 01 40 38 LMP Okay, 4 - -

02 01 40 39 CC I copy 1 minute; everything looks good.

02 01 40 48 LMP Okay, I'm going to let the AGS go.

02 01 41 02 LMP Okay, AVERAGE G coming ON.

02 01 41 04 CDR Okay, make sure you are standing up straight, so you don't get knocked on your can.

02 01 41 05 LMP Yes.

02 01 41 06 CDR Okay, 28 seconds.

02 01 41 13 LMP You won't even feel it, hardly.

02 01 41 14 CDR Yes.

02 01 41 20 LMP 15 seconds - -

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02 01 41 21 CDR Camera's on.

02 01 41 22 LMP - - camera's on; and it's going.

02 01 41 23 CMP Roger.

02 01 41 25 LMP Okay, ULLAGE, ON.

02 01 41 27 CDR ULLAGE is ON.

02 01 41 31 LMP PROCEED. 3, 2, 1 -

02 01 41 32 CDR Have we ENABLED it?

02 01 41 35 LMP IGNITION. We got it. MASTER ARM, OFF.

02 01 41 40 CDR Okay, there's IGNITION.

02 01 41 41 LMP Throttle up.

02 01 41 42 CDR We're throttling up to 40 percent, Dave. That's 40 percent. Look at that ball; my God, we hardly have any errors.

02 01 41 50 LMP Stand by for the AUTO THROTTLE.

02 01 41 53 CDR Okay, stand by for the AUTO THROTTLE? DESCENT REG light, DOWN.

02 01 42 00 LMP How's the pressure; it's going down?

02 01 42 01 CDR Pres - pressure's going down. Here comes that throttle out.

02 01 42 03 LMP Hey, that pressure's going down, Jim.

02 01 42 05 CDR Yes.

02 01 42 07 LMP It's going back up.

02 01 42 08 CDR Okay. Okay, pressure dropped down to about 190 there, Houston.

02 01 42 13 CC Roger. We copied ..., Spider.

02 01 42 15 CDR We're - we're full throttle, and atti - attitude errors are practically nil, Davey.

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Day 3 - Page 37  
Tape 09-03601

02 01 42 18 CMP Okay, looks pretty good over here, too.

02 01 42 20 CDR Yes, and just a slightest transient.

02 01 42 24 CMP Okay, your HP is 109 and moving.

02 01 42 26 CDR Roger. We've got 440 to go.

02 01 42 30 CMP I've got 443.

02 01 42 31 LMP SEQUENCE CAMERA coming OFF at 59. SEQUENCE CAMERA, OFF.

02 01 42 36 CDR I'm pulling 0.8 of a lunar g, in case you're interested. We're starting to get a little excursion in my yaw.

02 01 42 43 CMP Roger, ...

02 01 42 48 CDR Oh, we just threw a big hunk down at the ground, there. There goes another hunk.

02 01 42 52 CMP Yes, I saw a few pieces go, too.

02 01 43 02 LMP Okay.

02 01 43 03 CMP I have 405.

02 01 43 06 CDR Roger, so do we.

02 01 43 07 LMP And the PGNS and the AGS are counting down right together.

02 01 43 10 CMP I have 109.3 on the HP.

02 01 43 12 CDR Roger.

02 01 43 19 CDR Man, am I hungry.

02 01 43 21 LMP Me too. Okay, you're standby for a - -

02 01 43 25 CDR Yes, it really is, it's going along like a dream, except for all the hunk - -

02 01 43 29 CMP - - pieces back there, some of the foils coming off.

02 01 43 31 CDR/LMP Yes.

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02 01 43 36 CDR ... we're going over Texas right now, I think.  
... we ought to be over Houston pretty soon.

02 01 43 40 CMP 330.

02 01 43 42 CDR Okay, 330 here. Attitude errors are staying down  
less than 1 degree.

02 01 43 47 CMP Roger, 109.3 HP.

02 01 43 49 CDR Okay. We have 1100 feet per second to go.

02 01 43 55 CMP I'm right with you.

02 01 43 56 LMP And the AGS and the PGMS are right together.  
... information on the ground and the tape - the  
quantity is reading 76 and 74; and we don't seem  
to have any spurious lockups either at this time.

02 01 44 11 CDR REG - -

02 01 44 12 CC Roger, Spider; Houston. Copy.

02 01 44 14 CDR The REG pressure's holding pretty steady at about  
232.

02 01 44 19 LMP ... landing radar temperature is reading 95 at the  
present; it started out at 81.

02 01 44 27 CMP Okay, HP 109.3, and everything's clean over here.

02 01 44 31 CDR Okay, same here.

02 01 44 33 CDR Looks like - looks like it's done a real good job  
of steering.

02 01 44 37 LMP We've only got 890 feet per second left to go.

02 01 44 38 CDR Yes.

02 01 44 40 CMP ... when you call in.

02 01 44 41 LMP Okay.

02 01 44 43 CMP 229.

02 01 44 44 CDR Roger, 225 here.

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Day 3 - Page 39  
Tape 09-03601

02 01 44 50 CDR Okay, remember I'm going to start my throttle full throttle at 124.

02 01 44 54 CMP Roger.

02 01 44 57 LMP Okay, and the SEQUENCE CAMERA's going to come back ON at 200; you're going to throttle at 1 ... 4 - -

02 01 45 03 CDR Right.

02 01 45 04 LMP - - at 10 I'm going to shut DESCENT REG 1, OFF.  
At cutoff - -

02 01 45 08 CMP 2 minutes.

02 01 45 09 CDR 2 minutes here, I have 704.

02 01 45 11 LMP At - -

02 01 45 12 CMP 109.2.

02 01 45 14 CDR Roger.

02 01 45 15 LMP At cutoff you're going to hit the ENGINE STOP button.

02 01 45 19 CDR At 3 seconds, right.

02 01 45 20 LMP Right, at 3 seconds.

02 01 45 21 CMP You know, actually you are less than 0.1 degree per second.

02 01 45 23 CDR Is that right?

02 01 45 24 LMP And I'm going to go to ATTITUDE HOLD.

02 01 45 26 CDR Nice and ... solid here.

02 01 45 27 LMP ... all that?

02 01 45 28 CDR Yes.

02 01 45 29 LMP Okay.

02 01 45 30 CDR 600 feet per second to go.

02 01 45 33 CMP I'm with you.

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02 01 45 34 LMP Gee, that's looking pretty, isn't it?

02 01 45 36 CDR Yes.

02 01 45 42 CDR Okay, I've got about a minute 25.

02 01 45 44 CMP Right with you.

02 01 45 47 CDR Okay, when I start throttling, we're going to add a lot of seconds on to that.

02 01 45 50 CMP Roger.

02 01 45 55 CDR 450.

02 01 46 00 CDR 420 to go.

02 01 46 08 CMP 1 minute.

02 01 46 09 CDR 1 minute now.

02 01 46 12 CMP 109.2.

02 01 46 14 CDR Roger. Hanging right in there, isn't it?

02 01 46 17 CMP Yes, really slick.

02 01 46 19 LMP Surely it's surging.

02 01 46 22 CDR Yes. See if we're getting a roll surge. We're getting a roll, or some sort of an oscillation now, on it.

02 01 46 28 LMP Yes, it's going - it's - we're getting slosh.

02 01 46 30 CDR Yes. Hey, we're getting slosh. I've got 228 to go now.

02 01 46 34 LMP Camera coming back ON.

02 01 46 35 CDR Get ready for us - the throttling profiles.

02 01 46 37 CMP Roger.

02 01 46 38 LMP The camera's ON.

02 01 46 39 CMP ...

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Day 3 - Page 41  
Tape 09-03601

02 01 46 41 LMP Okay, 124.

02 01 46 43 CDR Okay, 170. 157. 145. Starting the throttle.  
40 percent. Going down to 10 percent. Back up  
to 40 percent. ... down to 25 percent.

02 01 47 14 LMP Back up again.

02 01 47 15 CDR Okay, coming up to 40 percent. Throttle profile's  
complete, we'll just let it sit there.

02 01 47 21 LMP Great, 27 seconds remaining.

02 01 47 23 CDR Roger, 24 seconds to go. I'm going to shut down  
manually at 3 seconds to go; I've got 18, 16, 15,  
14, ... - -

02 01 47 40 LMP No sweat.

02 01 47 41 CDR - - 12, ..., 10, 9, ..., get your hand out of the  
way. 6, 5, 4, 3, -

02 01 47 45 CDR SHUTDOWN.

02 01 47 46 LMP Correct ATTITUDE HOLD.

02 01 47 47 CDR The ATTITUDE HOLD here.

02 01 47 49 CMP I'm right with you all the way.

02 01 47 50 CDR Okay.

02 01 47 52 LMP Okay, SEQUENCE CAMERA coming OFF.

02 01 47 57 CDR Okay.

02 01 47 58 LMP Okay, request the CSM - have it; ENGINE ARM - -

02 01 48 00 CC That was a beautiful burn. Man, you were right  
down the tube.

02 01 48 04 CDR Yes, it looked pretty neat from here, too.

02 01 48 05 LMP ENGINE ARM to OFF.

02 01 48 07 CDR ENGINE ARM, OFF.

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02 01 48 09 LMP Okay, proceed. Okay, you want to read him those, while I copy them?

02 01 48 12 CDR Alright, you want our residuals, Houston?

02 01 48 16 CC Copying them on your DSKY now, Spider.

02 01 48 18 CDR Okay, very good.

02 01 48 24 CDR Hey, you know we could really feel that stuff sloshing around in here at the end? Okay.

02 01 48 33 LMP Okay, - PRO; VERB 79, ENTER; 00, ENTER - -

02 01 48 42 CMP ... about 0.3 of a degree per second.

02 01 48 46 CDR The offset that I had on my rate scale over here - I can't tell where zero is, but - it - it didn't deviate hardly at all.

02 01 48 50 LMP TTC - -

02 01 48 52 CC No, because you were oscillating right back, too.

02 01 48 56 LMP TTCA JETS, DOWN.

02 01 49 00 CDR JETS, DOWN.

02 01 49 01 LMP Verify ENGINE ARM, OFF.

02 01 49 02 CDR ENGINE ARM, OFF.

02 01 49 03 LMP ENGINE PUSHBUTTON STOP, RESET.

02 01 49 06 CC It ... beautiful all the way - Spider.

02 01 49 11 LMP Okay. THROTTLE CONTROL to AUTO.

02 01 49 13 CDR THROTTLE CONTROL to AUTO.

02 01 49 14 LMP Okay, landing radar temperature's 100?  
Roger. Landing radar temperature's 100 degrees right now.

02 01 49 22 CC Roger, copy. 100 degrees ...

02 01 49 24 LMP PROP QUANTITY MONITOR, OFF.

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Day 3 - Page 43  
Tape 09-03601

02 01 49 27 CDR PROP QUANTITY MONITOR coming OFF.

02 01 49 32 LMP Okay, INVERTER to 2. And I may get a MASTER ALARM - -

02 01 49 36 CMP Even the EMS took care of you that time: 1740.6.

02 01 49 40 CDR (Laughter) Roger.

02 01 49 43 LMP Okay, INVERTER 1, OPEN.

02 01 49 47 CMP Everybody's singing the same song.

02 01 49 50 CDR INVERTER 1, OPENED.

02 01 49 51 LMP CROSS TIE/BALANCE LOADS, going CLOSED.

02 01 49 52 CDR When you're integrated man, you got to do that.

02 01 49 56 LMP SEQUENCE CAMERA, OPEN.

02 01 50 01 LMP Okay, I want to read out 500. ... the AGS is good; the AGS 500 is reading plus 3. One's reading minus 5. And 502 is reading 0.

02 01 50 14 CDR And Davey, we're drifting now, so you have ATTITUDE CONTROL, again.

02 01 50 24 CMP Okay.

02 01 50 26 CDR Let's see. We are, aren't we? We have a 76 in here, I think.

02 01 50 31 LMP Yes, we do.

02 01 50 33 LMP VERB 8 - Hit a VERB 82, ENTER.

02 01 50 36 CDR VERB 82, ENTER. PRO.

02 01 50 45 LMP 273.0 by - -

02 01 50 48 CDR Dave, I - our orbit - is 273.0 by 109.2.

02 01 50 49 LMP - - 109.2.

02 01 50 53 CC Houston; I copy 500, 501, 502, and plus 3 minus 590.

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02 01 50 59 LMP That's a Roger, and we got a 273.0 by 109.2.  
Cutoff at 2 minutes; the landing radar temperature  
is 100 degrees.

02 01 51 12 CMP The Gumdrop's got 271.7 by 109.1.

02 01 51 16 CDR 49:59 - 49:51.

02 01 51 19 CC Roger, Gumdrop; Houston, copy.

02 01 51 27 CDR It's exciting the way the fuel and oxidizer  
pressures dropped off there during the start.

02 01 51 35 LMP Okay, R&D TELEMETRY CAL, ON.

02 01 51 40 CDR Houston, you're going to get a DFI CAL.

02 01 51 46 CC Roger. Understand you're ... DFI CAL.

02 01 52 14 CDR Houston, how long do we have to that burn 5?

02 01 52 19 CC Stand by 1 for that item.

02 01 52 22 CDR Okay, I'm going to get something to eat. All I've  
had so far today is a little bag of fruit salad.  
I'm about to starve to death, and I want to try to  
get something to eat right after this - we clean  
up this burn.

02 01 52 34 LMP We start the dry-out - Let's start the dry-out first.

02 01 52 37 CDR That CAL is complete.

02 01 52 38 LMP Okay. DFI POWER, OFF, but don't open the - the  
breaker.

02 01 52 42 CC Spider, Houston.

02 01 52 43 CDR DFI POWER's OFF.

02 01 52 46 LMP Okay, LANDING RADAR breaker, OPEN.

02 01 52 49 CDR LANDING RADAR's OPEN.

02 01 52 51 CC Spider, Houston.

02 01 52 52 CDR Go ahead, Houston; Spider.

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Day 3 - Page 45  
Tape 09-03601

02 01 52 54 CC Okay. We're going to do the SPS 5 at nominal time at 4 hours and a half from now.

02 01 53 00 CDR Okay, very good. Thank you.

02 01 53 02 LMP Okay, you want to debrief the burn anymore?

02 01 53 05 CDR Yes.

02 01 53 08 CDR Okay, ignition was slow.

02 01 53 09 LMP Hey, stand - stand by just 1 -

02 01 53 11 LMP Gumdrop, Spider.

02 01 53 12 CMP Go.

02 01 53 13 LMP Roger. We'd like to stop at an AGS CAL ATTITUDE, here somewhere.

02 01 53 20 CMP Oh! Very well.

02 01 53 24 CDR At ignition the chamber pressure went up very gradually to 10 percent. Slow, smooth, steady, no bump or anything. It just felt like somebody was sort of turning the water faucet on. I came OFF with the MASTER ARM; we got the - we got the MASTER ALARM on when I did that at a couple of seconds. I throttle on up to 40 percent. That throttle up I didn't make abruptly; the throttle - and the - the chamber pressure seemed to stay right together. I stopped at 40 and it did. I ... throttle up manually to - to automatic. We were 100 percent ... Now the attitude excursions I got during this time were practically nil, and the same thing with the rate. They're just practically nil and when we throttled up to 100 percent, the same thing: they're very low attitude excursions, very low rates. Considering - that we didn't have any attitude control ... except at slow engine, we did very well. It ran along steadily at 100 percent or 97 - percent - The chamber pressure looked like it went up and down from about 90 to 100 percent during the burn. It went along smoothly and right at the end, we were - we were feeling some surging and it looked like it was - it was controlling a little more in yaw than I expected it would. And we got a little roll rate in, but

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much less than a degree per second. Then we figured really - figures - probably the - the fuel sloshing around - the fuel oxidizer sloshing around in the tanks, and was probably the slosh. Now, you couldn't really see anything in the ball. I looked carefully at it, and I didn't see any attitude excursions, and I only saw that very slight ... bit of roll rate, but it was in a different frequency than the thing I felt. The - PGNS, the AGS, the G&N over the command module, and everybody all counted down together. About a minute and - about 130 - turn that off - At 130 feet per second we went to manual throttle and throttled right down to 40 percent. I got hold of the throttle and let it sit there for a couple of seconds, and then down to 10 percent, then up to 40, down to 25, back up to 40, and nominally we were supposed to get there at 30 seconds. I got there, I think, at 29 seconds to go. Then we just let it cruise on out, and no trans into here again. We shut the thing down ... to end - -

02 01 55 59 CMP

... to Spider. I'll have it over to you in about 3 minutes.

02 01 56 02 CDR

Okay. We shut down at the end. Rates were very low, and we gradually pitched up; no roll and no yaw; but it pitched up very gradually, much less than a degree per second. We got the manual shutdown at about 2 or 3 seconds. We got the regulators off; and I'll let you - Russ - to tell you about that. The regulator pressure - at that time, fuel and oxidizer pressures, were 232 when we started, and they went on down to about 185, then gradually built back up again to 230, until when they ran at 232, the whole time. The SUPER-CRIT PRESSURE got up to 830 during the burn and that's where it sits right now.

02 01 56 42 LMP

Looks like it might have been the quad that caused the heater light there at about 20 seconds before the cutoff.

02 01 56 48 CDR

Okay, I didn't see that.

02 01 56 49 LMP

Because quad 1 is now reading 185, 2 is reading 162, 3 is reading 185, and 4 is reading 152.

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Day 3 - Page 47  
Tape 09-03601

02 01 57 03 CDR Looks like we used a fair amount of fuel in system B, too.

02 01 57 08 LMP Couple of percent, there, huh?

02 01 57 09 CDR Yes, and we were supposed to be off scale HIGH for a long time. And, that's interesting, tape. We're reading in the RCS quad - or the RCS quantity right now. About 99, I guess, on A, and about 97 on B, and I think they're supposed to be considerably higher than that. Too-bad I don't have a - another camera; I could really take some pretty pictures. Or do we; no, it's all stowed away. There'll come another day for the pictures, I guess. We're crossing Africa. Alrighty, the temperature is 70 our fuel, 67 our oxidizer, reading 240 and 242 fuel and oxidizer; that's on DESCENT 1. DESCENT 2 is 70, 69, 240, and 242. I think that terminates my debriefing.

02 01 58 03 LMP I don't have much to add at all. Prop - the main propulsion quantity seemed to track pretty good. The ... radar climbed very slowly during the burn from about 81 at start, to close to 100, and it's now reading about 108 and the time is 49: ... 8:30? That's about all I've got. The HEATER caution - We got the MASTER ALARM due to shutting the MASTER ARM off right at the start.

02 01 58 44 CMP Okay, Spider; Gumdrop. That ought to be pretty close.

02 01 58 51 LMP Roger; that's good, if you'll go to FREE.

02 01 58 53 CMP In FREE.

02 01 58 55 LMP Roger.

02 01 59 11 LMP And, ... popping that I know of. The HEATER caution light on panel 2 came ON - -

02 01 59 24 CC ... Houston ...

02 01 59 25 LMP - - 50 just before the end of the burn. Go ...; Houston.

02 01 59 29 LMP Houston; this is Spider. Go ahead.

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Day 3 - Page 48  
Tape 09-03601

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02 01 59 32 CC

Roger. Spider, we'd like to ask you if after you finish eating there - before you transfer back - if there's any chance of getting the regulator check - checklist systems, page 17.

02 01 59 51 CDR

Oh, yes; okay.

02 01 59 56 LMP

... get it?

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Day 3 - Page 49  
Tape 09-03601

02 01 59 59 CC Okay, thank you.

02 02 00 00 LMP Okay, that's about all I've got here.

02 02 00 01 CDR Okay, I'm going to eat first, though, before I just drop over up here.

02 02 00 03 LMP I'm going to turn the tape off.

02 02 00 04 CC Roger, I just wanted to pass that on before you dismantled something. We'd really like to see you go ahead and eat, and we'll see you over Tananarive about 13.

02 02 00 18 LMP Roger. Okay, let me give you a hack, Dave.

02 02 00 21 CC Spider, we'd like to have LOW bit rate.

02 02 00 28 IMP Roger, LOW.

02 02 00 30 CDR What did you want, Rusty?

02 02 00 32 LMP Nothing. Okay, tape, it's - Now, my mark is going to be 50:00:45. 4, 3, 2, 1 -

02 02 00 45 LMP MARK.

02 02 00 46 LMP 50:00:45, and I'm going to turn you off.

02 02 35 30 LMP Okay, Houston, how do you read now?

02 02 35 34 CC I'm reading you out clear, Spider.

02 02 35 36 LMP Okay, that's step 1. I'm ready to go to step 2.

02 02 35 41 CC Alright. Let's go to step 2.

02 02 35 59 LMP Okay, Houston, how do you read now?

02 02 36 04 CC ...

02 02 36 07 LMP Houston, how do you read Spider?

02 02 36 10 CC ... loud and clear, Spider.

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Day 3 - Page 50  
Tape 09-03601

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02 02 36 14 LMP Roger; same here.

02 02 36 16 CC Okay, ...

02 02 36 19 LMP Going to step 3.

02 02 36 41 LMP Okay, Houston, how do you read Spider now?

02 02 37 00 LMP He doesn't come in worth a damn on PRIMARY.

02 02 37 04 LMP Alright. Houston, Spider. Try that once again.

02 02 37 12 CC ...

02 02 37 16 LMP Roger. I just got the last two words of that. Say again.

02 02 37 21 CC ... the S-band backup voice check has been ...

02 02 37 30 LMP Roger.

02 02 37 50 LMP Okay, Houston, how do you read on backup voice?

02 02 38 03 LMP Houston, this is Apollo 9 - or Spider. How do you read on backup voice?

02 02 38 20 LMP Houston, this is Spider. How do you read on backup voice?

02 02 38 23 CC Spider, this is Houston. Loud and clear. How me?

02 02 38 27 LMP Roger. You're 5 square. How do you read me now?

02 02 38 37 LMP You're 5 square, Houston. How do you read me?

02 02 39 02 LMP Houston, how do you read Spider now?

02 02 39 09 LMP Okay, you're 5 square. I'm supposed to be able to talk to you without pushing the PTT. I'm not sure I'm getting backup voice down to you. Tell me if you read up through 5 and back down.  
1, 2, 3, 4, 5; 5, 4, 3, 2, 1.

02 02 39 25 CC Okay, Spider; Houston. You blacked out 3 on the way up and came in with 3 on the way down.

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Day 3 - Page 51  
Tape 09-03601

02 02 39 34 LMP      Okay, I was using PTT up to 3 and then from 3 on down; and I understood the backup voice you were supposed to get right off the intercom.

02 02 39 49 CC      Spider, check the biomed ...

02 02 40 01 LMP      Roger, the biomed is off.

02 02 40 49 LMP      Houston, how do you read Spider?

02 02 40 59 CC      Spider, this is Houston through Honeysuckle. How do you read me?

02 02 41 03 LMP      Roger. Reading you 5 square. How me?

02 02 41 08 CC      Okay Spider, I can hear you transmitting now; you were way down and breaking up, but if you'll give me a count, ...

02 02 41 19 LMP      Roger. 1, 2, 3, 4, 5; 5, 4, 3, 2, 1. Spider out.

02 02 41 25 CC      Okay, Spider. You're a - you're relatively clear, but way, way down.

02 02 41 31 LMP      ... what did you want with the biomed? It is off.

02 02 41 50 LMP      Houston, did you want the - something done with the biomed?

02 02 42 02 LMP      Houston, Spider. Over.

02 02 42 06 LMP      Aw - Houston, Spider.

02 02 42 20 LMP      Houston, Spider. Over.

02 02 42 23 CC      Roger, this is Houston. We'd like to have you return to COMM BASIC.

02 02 42 27 LMP      Roger. Going back to COMM BASIC. And I'm going back to VHF A.

02 02 42 55 LMP      Is that tunnel open?

02 02 42 58 CC      ... Houston. I'd like to have you return to COMM BASIC ...

02 02 43 04 LMP      Roger, Houston. We are in COMM BASIC. How now?

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Day 3 - Page 52  
Tape 09-03601

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02 02 43 07 CC Yes, you're coming through clear now - Rusty. We did get the backup voice check in; it was way down low.

02 02 43 17 LMP Roger.

02 02 43 20 CC And we'd like to have the biomed switched on the LMP before the regular time, Spider.

02 02 43 33 CMP Spider, Gumdrop.

02 02 43 35 CDR Yes, Gumdrop; Spider.

02 02 43 36 CMP The tunnel is clear.

02 02 43 38 CDR Okay, very good. ...

02 02 43 40 LMP Roger; it is on the LMP, Houston.

02 02 43 43 CC Roger, understand; thank you, Spider.

02 02 43 47 LMP Roger, and be advised we are presently 28 minutes into the sublimator dry-out.

02 02 44 00 CC Roger, Spider, I copy that: 28 minutes into the dry-out.

02 02 44 04 LMP Roger, and be advised that we have a great deal more equipment powered up than we were supposed to during this dry-out. We're running a little behind in getting the tunnel clear.

02 02 44 21 IMP I'll finish up the checklist, Jim.

02 02 44 51 LMP Did you get an EVA checklist, Jim, over there?

02 02 44 53 CDR No, I didn't. Let me get this - let me get this stuff out of the way so we can get the hatch open.  
...

02 02 45 02 IMP Okay.

02 02 45 03 CDR ...

02 02 45 06 IMP Soon as you get that hatch open, we want to go to EGRESS.

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Day 3 - Page 53  
Tape 09-03601

02 02 45 09 CDR What?  
02 02 45 11 LMP I say we want to go to EGRESS mode.  
02 02 45 15 CDR Yes. Okay, let's do that.  
02 02 45 17 LMP Okay. Go.  
02 02 45 23 CDR PULL the EGRESS. ...  
02 02 45 29 LMP The REG's to EGRESS, right.  
02 02 45 31 CDR ... A, ... B.  
02 02 47 52 CMP Spider, Gumdrop.  
02 02 47 56 LMP ...  
02 02 47 57 CMP My, it sure takes you guys a long time to open that little hatch here.  
02 02 48 01 LMP ... ready for us?  
02 02 48 02 CMP Sure. Been ready for 10 minutes.  
02 02 48 03 LMP Okay, we'll be opening in a second here. ... ready, Jim.  
02 02 48 08 CDR Okay, I have the hatch open now.  
02 02 48 34 LMP ...  
02 02 49 09 LMP Okay, ready?  
02 02 49 12 LMP ... get that umbilical down here, and I got to get off this suit loop.  
02 02 49 15 CDR I know it.  
02 02 49 23 CMP Tell him to send the umbilical through.  
02 02 49 27 LMP That's going to be hard for you to get through, Jim.  
02 02 49 28 CDR What?  
02 02 49 29 LMP That's going to be too hard for you to get through.

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Day 3 - Page 54  
Tape 09-03601

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02 02 49 42 CDR Are you - Do you want me to sit here and clear this stuff out, Rusty, or -

02 02 50 45 LMP Okay, Jim.

02 02 50 46 CDR You sure?

02 02 50 48 LMP Yes, thanks.

02 02 50 51 CDR Hey, Dave? Hey, Dave? Hey, Dave?

02 02 51 22 CDR What do we need to take back with us to the ... ?  
The EVA checklist -

02 02 51 24 LMP EVA checklist, and the flight plan card. The sequence camera and the lenses.

02 02 51 40 CDR That's right. I checked - I checked the ...

02 02 52 06 LMP ... the camera.

02 02 52 24 CDR Okay. Hey, Russ, let me ... here.

02 02 52 26 LMP Okay.

02 02 52 27 CDR We'll make a transfer and see if ...

02 02 52 29 LMP Okay.

02 02 52 55 CDR ...

02 02 52 59 LMP Yes.

02 02 53 16 CDR ... I'll be back in just a second.

02 02 53 50 CDR Rusty, do you ... ?

02 02 53 53 LMP I ... think so.

02 02 53 55 CDR ... Well, come over here ... gloves on.

02 02 54 22 CDR Dave, ... Dave. Dave, ...

02 02 54 58 CDR Make that ...

02 02 55 01 LMP ...

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Day 3 - Page 55  
Tape 09-03601

02 02 55 26 CDR ...

02 02 55 29 LMP I don't think so. Hey, let me plot one more point on it here.

02 02 55 35 CDR ...

02 02 55 37 LMP No.

02 02 56 04 CDR Okay, I'll take ... over there.

02 02 56 06 LMP Slow down. And pass that umbilical back.

02 02 56 15 CDR Got it, Dave?

02 02 58 03 LMP Alright, Gumdrop; Spider.

02 02 58 06 CMP Did you ever mount your ...?

02 02 58 08 LMP Roger, stand by; not yet.

02 02 58 11 CMP What do you need?

02 02 58 15 LMP Just checking the COM.

02 02 58 41 CC Okay, Gumdrop, this is Houston. We ...

02 02 58 45 CMP Gumdrop; Roger.

02 02 58 59 CDR Anything else you wanted, Rusty?

02 02 59 02 LMP Yes, you got to get that checklist going fast.  
Shoot, I can't get my hose plugged in. God damn it.

02 02 59 20 CC Gumdrop, Houston. We'd like to turn the heaters and H<sub>2</sub> tank's 1 and 2 off.

02 02 59 27 CMP Okay, you have to stand by a few moments.

02 02 59 30 CC Roger; understand, Gumdrop.

02 02 59 37 LMP I'd like to get flow, Dave.

02 02 59 54 LMP ... Can you give me flow?

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Day 3 - Page 56  
Tape 09-03601

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02 03 00 07	CMP	You got full flow, haven't you?
02 03 00 09	LMP	... know. I can't tell.
02 03 00 12	CMP	... give it to you in that first column.
02 03 00 41	LMP	Okay, I'm going to switch COMMS, so give me a few seconds, and then turn my suit power on.
02 03 00 46	CMP	Okay.

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Day 4 - Page 57  
Tape 09-03601

DAY 4

03 00 40 07 CDR Hello there, tape recorder. It's working fine. The time right now is 72:40:10. The cabin down to what, 3.5?

03 00 40 16 CDR I can see it.

03 00 40 \_\_ CDR PGNS to AUTO.

03 00 40 \_\_ LMP Okay.

03 00 40 \_\_ CDR ... all the way to zero?

03 00 \_\_ \_\_ LMP Zero.

03 00 \_\_ \_\_ CDR You got that?

03 00 \_\_ \_\_ CDR PRESS in the cabin at this time.

03 00 \_\_ \_\_ CDR ... Rusty? Hey, on the tape, remember we have to be on the air for ...

03 00 \_\_ \_\_ CDR But we still have about 1 psi.

03 00 \_\_ \_\_ CDR Oddly enough, it's not going down.

03 00 43 \_\_ CDR ... 243, and we're down to about - holding at about 0.7 of a psi. I'll never get the door open against that ...

03 00 \_\_ \_\_ CDR Well, we ... opened ...

03 00 \_\_ \_\_ LMP LATCH HANDLE to UNLOCK.

03 00 \_\_ \_\_ CDR ... to where? ... not at all ... over any farther, huh?

03 00 44 29 LMP Unlock it?

03 00 44 30 CDR Right there. No, I can't pull it open. None.

03 00 \_\_ \_\_ CDR ... and the pressure seal's broken, too.

03 00 45 \_\_ CDR ... air bubbles in it ...

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03 00 45 \_\_ CDR ... yes ... Slowly.

03 00 45 52 LMP ... pulling the cabin off.

03 00 45 56 CDR ... we're at ...

03 00 \_\_ \_\_ CDR ... I haven't got it ... no ...

03 00 46 37 LMP Hey, Dave, it's all open up over here.

03 00 \_\_ \_\_ CDR ... making out ...

03 00 \_\_ \_\_ CMP You'll swing that.

03 00 \_\_ \_\_ CDR Got the other LCG on.

03 00 \_\_ \_\_ LMP Got that?

03 00 \_\_ \_\_ CDR Yes ... feeling ...

03 00 48 06 CDR ... I'll pass you up your Hasselblad. Then I'll pass you the camera - a movie camera right after that. Thereafter ...

03 00 48 53 CDR ... a couple of pictures and pass you the Hasselblad. You take a couple and pass it back ... the movie camera, and I'll take some more pictures of ...

03 00 49 \_\_ LMP ... back to ... where it belongs.

03 00 49 \_\_ CDR It's now 47. Further on at 47; it's now 49:35. Do you read ...

03 00 49 \_\_ LMP ... cooling yet?

03 00 49 \_\_ CDR It ... up.

03 00 49 \_\_ CDR ... up, lock, flying your tether?

03 00 49 \_\_ LMP Yes.

03 00 50 \_\_ CDR ... it's now - 72:50, and we've turned the ... on ..., cool, and Rusty said he feels the cooling come ...

03 00 51 \_\_ CDR We're all set over here, Dave. You're - you're clear to DEPRESS. Very good.

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03 00 \_\_\_ CDR ... buckle down. ... 10 is all bent out of shape,  
but it'll ... pull it's ... Oh, it's alright now  
...

03 00 52 09 CDR Got to be careful now; that's sharp on the door  
handle ...

03 00 52 \_\_\_ LMP The ... will wipe that out.

03 00 52 \_\_\_ CDR ... the back handle.

03 00 52 20 LMP I have it Velcroed closed again.

03 00 \_\_\_ CDR Okay. We're doing fine. ... tangle on any of  
the knobs, either, on the way out. ... 10 minutes  
to sunrise ...

03 00 53 31 CDR Houston, you read Spider? When's our next station  
pass over there, Rusty?

03 00 56 22 LMP Hello, Carnarvon. Do you read Spider? ...

03 00 56 \_\_\_ CDR That's alright.

03 00 57 \_\_\_ CDR This is Spider, transmitting in the dark. If  
you can read - fine - if you don't - too bad.  
It's 72:57; we've had this cabin depressurized now  
for about 12 minutes. Looks like it's going  
along fine. Had a little trouble getting the door  
open, but it's open now. ... seems to be working  
alright, and - Dave is in the process of depres-  
surizing the command module ... Gummy, this is  
Spider. ... anything when you open the door.  
... Okay, ... the goaltender - keep everything  
in ... Hey, we're about - somewhere between -  
7 minutes of being a sunrise, Dave. You might  
go ahead and start the door ... quieter now ...  
I wasn't hearing any data for a long time; I  
wasn't hearing any noise for a long time, then  
about ... it sort of dribbled on down. I thought  
that's what that ... was ... Crank that up -  
It was just as clear as a bell. Now it's not  
making as much as it was before you entered ...  
cooling. Cooling ... Hey, let's hope it swings  
back again now ...

03 00 \_\_\_ CMP Are you in the - relay -

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03 00 \_\_ \_\_ CDR I think it's going to get to be sunlight pretty soon. ... see Hawaii on the horizon ...

03 00 \_\_ \_\_ LMP Shoot that other - go ahead, I - There's nothing I can do about that ...

03 00 \_\_ \_\_ CDR ... the door ... the door on your hoses ... Well, alright ...

03 00 \_\_ \_\_ CMP Looks pretty good.

03 00 \_\_ \_\_ CDR Hey, that's far enough, why don't you just hang right there until ... Why don't you just stay there until the sun gets up ... You holler, Dave, when you - Looks light enough to take a picture. ... view pretty neat, huh? I plan to as soon as Rusty gets out of the way. I especially rolled back the shade, just so I could see you, Dave.

03 00 \_\_ \_\_ CMP Very good.

03 00 \_\_ \_\_ CDR Okay, I'm going to reset the DET here and get her going up ... over there, Dave. Now we'll fly DEADBAND. LIMIT CYCLE? ... that ought to about do it, hadn't it? ... Mr. Schweickart, proceed out the door ... I see a little bag full of ... floating away. Red dot on it. Try mine. Davey, hey - Rusty, the ... is going to be useless from in here except to take a picture of Dave, which I am going to do here in just a minute. Why don't you just stand out there and just sort of ... easy for a while. Get that door all the way closed there for fear we'll never get it open again. ... down there, Davey.

03 01 09 07 CMP Hey, Rusty, why don't you throw the - Let me see if I can - What he's - Everybody's tethered down except me. Very interesting.

03 01 \_\_ \_\_ CDR Hey, Rusty, why don't you ... gloves working out, Dave? ... Rusty, the sun's hot on those gloves. ... the camera?

03 01 12 \_\_ CDR Houston, this is Spider. Anybody reading us? ... Davey ... just a second, and I'll send in the movie camera. Send the movie camera for that ... minutes

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into a 15-minute pass. ... left hand up a minute, Dave.

03 01 14 \_\_ CMP

Okay.

03 01 14 \_\_ CDR

Just checking it. What was that, a bolt?  
(Laughter) It's a little mole in a hole over there, you pop up every once in a while ... See you're still getting rid of a lot of that junk ... Well, it's just dirt though. (Laughter) ... you're feeling, Dave. Keep hopping back down like that; that's a good idea. I said keep hopping up and down like that; it looks like a good idea. ... Not far enough, huh? Good, how you feeling?

03 01 16 \_\_ LMP

Fine.

03 01 16 \_\_ CDR

... stay up another 30 minutes.

03 01 16 \_\_ LMP

...

03 01 16 \_\_ CDR

I'll ... the sequence camera if you're through with that other one. Sure isn't. ... out there; shoot, I could have taken it ...

03 01 17 56 CDR

Yes, send the camera back in here; I'll take a picture - a couple of pictures like that.

03 01 \_\_ \_\_ LMP

...

03 01 \_\_ \_\_ CDR

How about getting over by the other window? That one's in the shade.

03 01 \_\_ \_\_ LMP

Okay.

03 01 18 43 CDR

... See you out this one. Let me see if everything is still set. You have a reflection of you - Oh, I've got to have that camera and get you - I can see you - Yes - and in your visor, our spacecraft Gumdrop completely all the way down to the bottom of the service module and the whole earth behind you.

03 01 19 04 LMP

Where?

03 01 19 05 CDR

... your visor; it's really fantastic ... even with you as soon as we get back together. Hey -

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Rusty, let me ... camera back in or I'll send you the sequence camera. ... ahead, Houston. Everything's going along fine up here. Do you have anything special that you want done in this pass? .. sure we can get that configured out quickly. ... I want to get it through there without putting a hole in that door. ... the time limit. How you feeling, Rusty? Hey, you want to go ahead and try to run the thing for the ... passes and the one night pass? ... think we might be able to do that for you. The thing that bothers me is that - if it does - we may have to reconsider how we are going to do that ... tomorrow. We're going to have to get some sleep here sometime. ... it over and see what you decide. Hey, Rusty, why don't you start hauling it out again?

03 01 \_ \_ LMP

Okay ... Let me ...

03 01 \_ \_ CDR

Hey, I sort of felt that way, too. I don't think we ought to try that transfer for sure ... we'll terminate here. ... come on out, wherever you are. ... Rusty, why don't you lean over here again. I'd sure like to get a picture of that whole scene. ... fantastic ... those window marks are all over there ... Okay ... Dave, let me get around here where I can get a picture, too ... These marks all over the window. Shoot, oh dear ... You're ahead when you're out there, you know. This isn't a contest between you and that sample ... Hey ... Someplace that's not too hard to recognize ... f:ll your stop, set on infinity ... I wanted one out there. No, the other ones were taken at - It depends on - One of them got knocked over ... Got knocked over when you were - when it was going out ... better leave it there. ... know there's a washer between the two panes of our overhead window? It's 24 minutes through the run. We've got about another 15 minutes, and then we should start thinking about getting back in. ... the water's all dirty. Things are still falling out up there. What are you doing, throwing everything overboard? ... it sticks out, but the city doesn't. (Laughter) The winds look pretty strong ... Clouds ... Hey ... blue from

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up here ... No, I haven't heard him say anything either ... This is Spider; do you read? ... Yes, I heard him then ... This ... Spider, do you read?

03 01 34 14 CDR Hey Rusty, why don't you pass the camera back in here, and work on the handle holds up to - hand-rails up there for just a minute. Come here and let me get this other one zipped in.

03 01 \_\_\_ \_\_\_ LMP Yes.

03 01 \_\_\_ \_\_\_ CDR Easy out there, I don't want you - getting ... Sun's really bright ... that tether - You're getting things in and out, but they are sort of out of control. Just getting them through that - that last part of the door there - They ricochet off everything on the door ... Want the camera back again?

03 01 35 35 LMP No, that's alright.

03 01 35 \_\_\_ CDR You've got about 10 more minutes out there and then you ought to start coming back in. Be in when it's still light outside ... Shoot something out there, we'll make a satellite. Coming right between your legs.

03 01 36 14 LMP Is it really?

03 01 36 15 CDR No, it bounced off on your knees ... Figured it would be. Dave, if - if you - if you don't think you can hack it - ... Heck, Rusty, why don't you get out there and move around a little bit and - if Dave - Hey, there goes your camera, Dave. Why don't you exercise the handrail a little bit just to see how they work and ... very far up, and if Dave gets a picture fine; if he doesn't, well, that's just too bad. He's got to go 90 degrees to that way, Dave.

03 01 \_\_\_ \_\_\_ CMP Yes.

03 01 37 \_\_\_ CDR Hey, you ... looks very great either. (Laughter) ... see one of those things before, Dave?

03 01 37 \_\_\_ CMP ...

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03 01 \_\_\_ CDR Why don't you come over and get the thermal sample and get it in, so we don't have to mess around.

03 01 \_\_\_ LMP That's a good idea.

03 01 38 00 LMP ... movie camera. If it runs again, it'll be a miracle. ... just gotten bashed around that ... doesn't hook on to it right and it slides up and down the wire, and it's got that stretch cable in it, so every time the tension comes out the stretch cable slams it into something. Hold it.

03 01 \_\_\_ CMP Okay - I've got it.

03 01 \_\_\_ CDR Kind of smashed around a little bit, too. I heard these cameras are good for one film pack, and that's about it when you're doing - work like this with them. ... the nut. (Laughter) ... If you'll just - hang on just a second. Oh, goodness! Get down in there food. Ah - ...

03 01 39 \_\_\_ LMP Yes.

03 01 39 47 CDR Rusty, I want you to evaluate those handles and - when you get through with them, I want a conclusion from you on whether or not - A practical way of doing it, like we've already said it is.

03 01 39 \_\_\_ LMP Okay.

03 01 \_\_\_ CDR Use the radar antenna.

03 01 41 \_\_\_ CDR Hey, let me - any left of that one. Go on back down it again, and, Dave, did you get your movie camera running yet? Got 4 minutes. (Laughter) When the 4 minutes are over, we're going to have to come back in without the movies. If we get them, fine. ... in the window here, can you?

03 01 41 \_\_\_ CMP Okay.

03 01 41 \_\_\_ CDR ... getting good pictures is to take a lot of them. These aren't going to be very good; you just can't - You're just not over far enough.

03 01 42 \_\_\_ CMP They pretty good? ...

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03 01 \_\_\_ CDR

Good idea. Don't touch the quads.

03 01 43 \_\_\_ CDR

The trouble is, I've got this glass here with all the marks on it. I'm trying to take pictures around there; I'm not sure I'm succeeding ... Dave, you've got about 2 minutes to take some pictures. Why don't you turn it on - and, Rusty, why don't you go up - go up and down the - down to the shoes and up there again and call it quits? Hey, Dave, you have it running yet? ... set it on 24 frames a second. ... because - to come in. Hey, Rusty, why don't you start coming back in? ... Oh, shoot. Sure like to. The door finally got itself closed and stuck now, again.

03 01 46 \_\_\_ CDR

... golly. I'll do my best to stay out of your way. The only trouble is my hoses are kind of out where you're liable to hit them. I think they are out of your way. ... Hey, this way. Can you get over towards me. ... stand right up, you'll be all set ...

03 01 46 43 CDR

Don't let the hatch go closed, whatever you do ... Okay, now see if you - pull up all the straps; pull up all the tethers.

03 01 46 \_\_\_ LMP

Okay ...

03 01 46 \_\_\_ CDR

... right there on my hand ... Some more now. One long strap hanging down. Look out now ...

03 01 47 \_\_\_ CDR

Go to that - We go to that ? plus 15 checklist right there ... Come on egress forward hatch, closed and locked. ... That's right, that's right here. Give me a while to go down and get that thing closed. I just wanted to make sure you got back inside ... Some trouble with the hatch, everytime it's - once closed; it hung up up there on the top ... Sure we're clear that thing while it's still daylight. Here, we've got to close that thing so I can see the hatch before I try to lock it ... I think it's okay ... No, like the way it is. The best thing you could do is if - if you can - is to gather this tube up here ... keep it up off the floor ... Okay, Davey, you ought to start getting your hatch closed ... Start getting your hatch closed,

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if you're not already doing it. Not quite. It's closed, just not locked ... What did you do with that - I've got to get my head in front of your legs instead of behind it. That's good. It's closed. ... foot caught ... Let's go back to the 215 thing there. Opps, just stay right there. Okay. Can I - Let me get the cloth over it. Hey, don't - I got it. VALVE, AUTO. And this one should be in AUTO. PRESS going to AUTO. Yes, let's see - What's - What are the steps after that? ... DELTA-T CABIN REPRESS to AUTO CABIN and it's 4.4 psi ... I'll do it at 46:10. ... Huh? ... Start REPRESSING it ... What's that? Right FLOW CONTROL, CLOSED. ... GO. ... ears.

03 01 52 07 CDR

How are your ears, Rusty?

03 01 52 09 LMP

Alright ...

03 01 52 10 CDR

Okay.

03 01 52 38 CDR

Okay, we're at 2 psi.

03 01 52 48 CDR

2.3.

03 01 52 59 CDR

Okay, 3. I don't even see the cabin pressure ... 3.5. 4.4. You're coming up with it, or you're slipping down? ... CB(16) SUIT FLOW, CLOSED. A and B MASTER ALARM and CABIN WARN LIGHT, ON. Okay. Pressure increasing, give CMP GO for REPRESS. Hey, Gumdrops, this is Spider here. REPRESS here about 68. Yes. They're giving you a plugged nickel for that. I wasn't sure we were even going to be up here today. (Laughter) Here you go. Hey, they got PLSS O<sub>2</sub>, OFF? Hey, LMP operates the OPS PURGE valve to depress the suit. You found that? DEPRESS valve closes at 4.4. If LM DESCENT O<sub>2</sub> - Yes - ... valve, OPEN; OVERHEAD DUMP valve, AUTO ... EVA systems. Oh, CABIN REPRESS - For him, yes. EVA systems configuration. FAN 1, CLOSE. CABIN FAN 2, anyway - FAN 2. GAS RETURN to AUTO. RELIEF is AUTO. CABIN. And that's just - Oh, we're not going to pressurize him. ... Take your helmet off? Put this stuff back on if we're going to pressurize him. Don't

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want to open up a big hole in the roof with - if he's in a vacuum. Just like opening up the front valve. How you doing over there? ... the other hoses. Stand by just a minute, Dave. Just want to put Rusty, on the suit hoses - the spacecraft, and I'll be right with you. The blue in the red hole ... Yes, but mine do. I want to force it in. Push it in again if you want to push on it ... start all you do is push it ... Hey, Dave, are you ready? PRESS. Hey, come and repress you with our oxygen ... like to have me pressurize you with the LM oxygen. Okay. Here, I'm cut off. ... I can hear something ... goes along and stops ... Great. Cabin pressure now. Very good. He can cut off again; he goes along; drops right off like that. There's a - there's a long string of static that - just cuts off. I thought I just saw a whole bunch of those. There's another - a copper with a screw to it. ... man, here comes your old gas. I'll give you ... pressure, Rusty, would you read that to me?

03 02 00 32 LMP

Good ... 0.8.

03 02 00\_\_ CDR

... coming up, Rus - or Dave? The O<sub>2</sub> quantity? ... I - I'm cutting it off myself, too, because there's - so much crap floating around back there, and I want to get in the dump valve. No, it's not. ... yes, now, Dave. ... point 2, 4.2 ... you're just a little more ... stop right there. ... for you. Go ahead and start reconfiguring here now, I've given you all you're going to get. ... CABIN FAN 1, CLOSE; SUIT/CABIN FAN ... doff helmet and gloves.

03 02 \_\_ \_\_ CMP

Go to it.

03 02 \_\_ \_\_ CDR

... all the ... does not have those liners on. Look at that. ... that's it.

03 02 03 47 CDR

Okay, we'll see you later. How we want to configure ... can't hear me, I don't believe. Can you? I can't ... out of here. ... hear you. ...

03 02 07 \_\_ CDR

Houston, this is Spider here. ... repressurize at this time. Everything's hunky-dory on board,

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and we're just reconfiguring. We're trying - we're trying to make that TV pass for you. ... hold onto this, and I'll put the cover back on this thing you've ... close up with these on. ... Hello!

03 02 07 35 LMP Hello.

03 02 07 37 CDR Okay, let me turn off your VOX. Okay.

03 02 12 27 LMP Okay, you're back in basic over here.

03 02 12 28 CDR Alright. Okay. Let's - Why don't you hold these, and I'll go put your helmet in the back so it won't float away, and then we'll take that crap off.

03 02 12 45 LMP Well, okay. Then we got to re - we got to re-charge it before we take it off.

03 02 12 52 CDR Uh oh. What I did with that thing ...

03 02 12 59 LMP I tell you, one thing I kept wanting to get out of here was that helmet bag of mine. Holy Christmas!

03 02 14 11 LMP Thank you, by the way.

03 02 14 12 CDR Okay, appreciate it. That's what we came up here for. I just don't want you getting yourself killed.

03 02 14 19 LMP No. Well, I agree with you on that one. Let's see if we can avoid it the rest of the trip.

03 02 14 34 CDR Oh, shoot! Let's - let's get this ... up before we - It's a real rat's nest.

03 02 14 40 LMP Yes. You want to try to keep it in there?

03 02 14 48 CDR Well, I don't know what the hell else to do with it, do you?

03 02 14 51 LMP Okay, well, why don't I fold it while you do something useful.

03 02 14 53 CDR Yes. Okay. Hey -

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03 02 14 59 LMP Oh, by the way, we want to change out the - the LiOH, and do a lot of things, you know, while it's still on.

03 02 15 05 CDR Yes, right.

03 02 16 35 CDR Get that later. Okay, we don't need the - this anymore, do we?

03 02 16 42 LMP Hey, - could you turn down my intercom volume a little bit? You're killing me.

03 02 16 48 CDR How's that? 1, 2, 3, 4, 5.

03 02 16 50 LMP No, still too loud. Lower. Okay, good, great, whoa!

03 02 16 55 CDR 1, 2, 3, 4, 5. How's that?

03 02 16 56 LMP That's good.

03 02 16 58 CDR You need this anymore?

03 02 17 00 LMP A - Yes.

03 02 17 02 CDR Save that for the recharge.

03 02 17 03 LMP Yes, re - the recharge. Okay, why don't you start reading the checklist here, while I finish this up.

03 02 17 26 CDR Forgot to put the purge valve in your thing.

03 02 17 30 LMP In my what?

03 02 17 32 CDR Your helmet bag.

03 02 17 33 LMP Oh yes.

03 02 17 45 CDR Shoot.

03 02 18 00 LMP Shoot, man, the control out there is easy as pie. My God, I wasn't even moving.

03 02 18 29 LMP Gee, too bad we couldn't quite see Houston.

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03 02 18 31 CDR Yes, that was a shame, wasn't it?

03 02 18 33 LMP Yes. Wonder why they left the radio?

03 02 18 39 CDR I don't know. I wonder what happened to our cameras. We better check these mothers and see if they still work.

03 02 18 49 LMP Alright, that one does. It was working great outside.

03 02 18 58 CDR Yes, it seems like it does. After we got that handle on it, we'll never get it off.

03 02 19 04 LMP Yes. Okay, now I got to - I'm ready to put the - -

03 02 19 12 CDR ... that.

03 02 19 15 LMP No, that's just that decal. I'm ready to put the flap around this thing.

03 02 19 21 CDR Whoop. You better look that one over. It really got bashed around coming in.

03 02 19 24 LMP Yes. Hey, wait a minute. Don't - don't -

03 02 20 17 CDR PLSS PUMP, OFF; PLSS FAN, OFF; PLSS MODE, POSITION 3; connect the LM COMM audio. COMMANDER SUIT ISOLATION to SUIT DISCONNECT; COMMANDER SUIT ISOLATION, SUIT FLOW. Emergency cabin repress. Okay, we finished all that. Okay, that helped.

03 02 20 42 LMP Okay. Here's the tether.

03 02 20 54 CDR Okay, here's the checklist. I'll trade you.

03 02 20 56 LMP Okay, let me see whether I can move here. Okay.

03 02 21 06 CMP Spider, Gumdrop.

03 02 21 09 LMP Alright, go ahead, Gumdrop.

03 02 21 10 CMP How you doing over there?

03 02 21 12 LMP Fi - Okay, we're trying to get through the - the mess in here, and get it back stowed again.

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Tape 09-03601

03 02 21 18 CMP Okay, now. Everything's cleared away over here. We're back up to 521, the O<sub>2</sub> flow high's down, and everything looks good.

03 02 21 26 LMP Okay.

03 02 21 30 CDR Good job, David Scott.

03 02 21 34 CMP Good job to you guys. That was really a neat demonstration. That made it look pretty easy.

03 02 21 46 LMP Yes, it really was, as a matter of fact. Okay.

03 02 22 09 LMP Okay, we can go red to red - red to blue, and blue to red, if you want. I don't want to. Okay. Here we go. Next - -

03 02 22 15 CDR ... you give me that other EVA card over there.

03 02 22 20 LMP Okay. I didn't figure out the rendezvous - Well, we'll do that later. Okay, log the DELTA-T - -

03 02 22 28 CC ...

03 02 22 32 LMP Houston, this is the Spider.

03 02 22 34 CDR Let Dave talk to them. We got to get this mess cleaned up.

03 02 22 39 CMP And Houston, this is Gumdrops. Back up to 5.1 and everything is very nominal.

03 02 22 44 CDR Let me see this just a minute.

03 02 22 45 LMP Okay, that's right where we want to be.

03 02 22 46 CDR Well, let's see - -

03 02 22 47 CC We copy, Gumdrops.

03 02 22 48 LMP EVA-23. Houston, this is Spider.

03 02 22 54 CC Copy.

03 02 22 57 LMP Spider, wha - here, Houston. What time was that TV pass?

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03 02 23 09 CMP Spider ...

03 02 23 17 LMP Hey, Gumdrops, I can't read them. See if you can get it. (Coughing)

03 02 23 20 CMP Roger. Understand. Houston, 74 plus 57 to 75 plus 13. Is that correct?

03 02 23 28 LMP Yes.

03 02 23 30 CMP Okay, you copy?

03 02 23 31 LMP 74 plus 57.

03 02 23 33 CDR Yes, we got it.

03 02 23 35 CMP He copied.

03 02 23 37 LMP Okay, - Look, that's strictly a COMM thing. Why don't we set that up now - -

03 02 23 40 CDR Yes. Just set it up?

03 02 23 42 LMP - - and then press on with the rest.

03 02 23 43 CDR That's what I think we probably ought to do.

03 02 23 44 LMP Okay?

03 02 23 45 CDR Yes.

03 02 23 46 LMP Let me get this TV out.

03 02 23 47 CDR Maybe we can get that PLSS off your back, and - and move it back here a little ways.

03 02 23 49 LMP Well, I'll tell you what, let's get -

03 02 23 50 CDR Why don't we hurry up and do that, and then we can - -

03 02 23 51 LMP Let's see a - okay ...

03 02 23 53 CDR Read the checklist.

03 02 23 54 LMP Okay, read the checklist. Log DELTA-T of the LiOH and O<sub>2</sub> recharge. Okay, I'll reset it here.

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Tape 09-03601

03 02 24 02 CDR We still have the tape on. I guess I should turn it off, huh?

03 02 24 06 LMP Yes, it's all ...

03 16 56 22 LMP ... COMM checks incomplete, and I guess the only thing we found is that my PTT doesn't seem to work at all. Let me try it one more time here.

03 16 56 34 LMP Okay, how do you read now? Gumdrops, how do you read, Spider? Gumdrops, how do you read Spider?

03 16 57 05 LMP ... it doesn't work on PTT. Now interestingly enough, Jim - ... over to a ... Spider ... I went to - I'm on VOX now ... is that the intercom bus should not be triggered ... The tape recorder does not go off. It looks like there's something funny there, too. ... I'm sorry. ... on VOX, and on VOX the intercom bus should not be triggered except when I'm talking. ... The tape is going off now.

03 17 34 38 LMP Hey, tape, in case you're working, I'd like you to know that the window shades in the LM are no damn good. They - they let in too much light for one thing; and, for another thing, they're extremely difficult to reinstall after you've taken them down one time.

03 17 34 52 CDR And when you take them down, then they don't roll up.

03 17 34 54 LMP Okay, and I guess we ought to also say a few other things here. When we put in the LDC DSKY circuit breaker, it turned out that even though we'd gone to STANDBY on the - system stage, we were not in STANDBY when we pushed in the LDC DSKY circuit breaker. It came up with a flashing 37 in P06, and what else have we got? The commander's OPS heater circuit breaker - or, heater test flight seemed to be either inoperative or intermittent, depending on which time you do them. I couldn't get them to work at all today. They didn't work for me the other day, but Jim did it one time and it worked. Also, the - yes, excuse me - LMP PTT, either umbilical or on the ACA, is inoperative today, and the only way I can transmit is with the VOX, which works fine. Okay, tape, and you're going OFF at 89:36. 2, 1 -

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03 17 36 00 LMP MARK.

03 17 36 01 LMP 89:36 and you're going OFF.

03 18 23 26 LMP ... tape. The time is now 90:23 - and we just finished pressurizing the ascent system, and following that, we cycle the ascent feed valves, that ... already been positioned on the system's day, and I noticed that when we cycled - recycled the ascent feeds 1, and the ascent feeds 1, in both systems open, that ... valves went OPEN. I could feel them in my feet.

03 18 24 12 LMP Was that 9 - 90:24 - 90 -

03 18 24 18 CDR Hey, let's see RCS cold fire.

03 18 24 22 LMP That's a swinging idea. Let me just make sure of that again now. (Coughing) I want these open. Okay. Okay, CSM MIN DEADBAND and ATTITUDE HOLD so - -

03 18 24 40 CDR Well, let's try to do without that.

03 18 24 42 LMP Okay. X-TRANSLATION of 4 JETS.

03 18 24 46 CDR 4 JETS.

03 18 24 47 LMP Verify quad temperature's 120.

03 18 24 48 CDR I've already done that.

03 18 24 49 LMP Have you reset the DET time?

03 18 24 51 CDR No.

03 18 24 52 LMP Okay. Those have been - We've been above 120 for an hour and 25 minutes right now. We ought to keep track of that.

03 18 24 59 CDR Right. Okay, got that.

03 18 25 03 LMP Okay, - the SYSTEM A and B QUAD ISOLATION VALVE, eight, OPEN; ATTITUDE CONTROL, three, to MODE CONTROL. It's verified. MODE CONTROL, ATTITUDE HOLD.

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Tape 09-03601

03 18 25 18 CDR They're verified.

03 18 25 20 LMP Okay, and mine are OPEN here.

03 18 25 22 CDR Okay, mine are OPEN.

03 18 25 25 LMP VERB 48, ENTER; LOAD the DAP.

03 18 25 32 CDR Okay, what am I going to put in it?

03 18 25 34 LMP 2012.

03 18 25 36 CDR 201 -

03 18 25 45 LMP Alright. Yes, we're ...

03 18 25 46 CDR 2012.

03 18 25 47 LMP Hey, look, while you're there - here, why don't we load those up right now.

03 18 25 50 CDR Okay. Sure will.

03 18 25 55 LMP Okay, LM weight - -

03 18 25 58 CDR Go.

03 18 25 59 LMP - - is 22 145. The CSM weight is 27 009.

03 18 26 13 CDR Right.

03 18 26 16 LMP Okay, PROCEED. And these angles now - are plus 00428 and 00730. Okay, ENTER, and the VERB 34.

03 18 26 42 LMP Okay. VERB 77, ENTER.

03 18 26 59 LMP VERB 15, NOUN 01, ENTER. That ought to get it.

03 18 27 01 CDR Okay.

03 18 27 12 LMP Okay, roll, pitch, and yaw.

03 18 27 42 LMP Let's get this thing - out. Okay. I don't want to read that rendezvous radar.

03 18 27 49 CDR Okay.

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03 18 27 52 IMP Okay.

03 18 28 23 LMP Okay, VERB 11, NOUN 10, ENTER; 5, ENTER.

03 18 28 36 CDR Easy ups and downs.

03 18 28 37 LMP COMMANDER, ACA, roll and pitch at 245, 132, 226, on pitch. Okay. And 151.

03 18 28 59 CDR Okay.

03 18 29 00 LMP Okay. TTCA, up and down, 252 and 125. Okay.

03 18 29 28 LMP Okay. ENTER; 6, ENTER. Okay, yaw, right, left, 252 and 125, - and right, - -

03 18 29 40 CDR Wait.

03 18 29 41 LMP - - left, fore, aft, 220, 140, 11, and 6.

03 18 29 50 CDR Okay.

03 18 30 04 LMP They all work. Okay, I'll give it VERB 76, ENTER; VERB 11, NOUN 10, ENTER, 31.

03 18 30 23 CDR Do we - do we do the ... for the AUTO - -

03 18 30 25 LMP Sir?

03 18 30 26 CDR ... too?

03 18 30 27 LMP We're doing it right now. Okay, roll, pitch - No, not yet.

03 18 30 31 CDR Okay.

03 18 30 32 LMP Roll, pitch, and yaw, 57, 37, 76, 75, 67, and 73.

03 18 31 06 LMP Okay, now AUTO, 5, okay ...

03 18 31 09 CMP Spider, this is Gumdrops. You got alignment?

03 18 31 12 LMP Very good. Okay, let me just mark down that we did that at 90 -

03 18 31 20 CDR Okay, we'll be with you in just a minute, Gumdrops.

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Tape 09-03601

03 18 31 23 CMP Roger.

03 18 31 41 CDR Real good. He sounded real good.

03 18 32 05 LMP Gumdrop, how do you read? Okay, Gumdrop, you can go into your MIN DEADBAND, ATTITUDE HOLD, and read out the 06 20 for us.

03 18 32 20 CMP Roger, stand by 1.

03 18 33 06 CMP Okay, here's those ... here and we're MIN DEADBAND, ATTITUDE HOLD.

03 18 33 12 LMP ...

03 18 33 13 CMP 14749, 29000, 34671.

03 18 33 26 LMP Okay, 14749, 29000, 34671.

03 18 33 33 CMP Got you, babe.

03 18 33 35 LMP Okay. Be right with you.

03 18 33 40 CDR (Singing)

03 18 34 32 LMP Okay, you ready? VERB 41, NOUN 20, ENTER. Okay, plus 15487. That's a GO. Plus 02000. That's a GO. Plus 01329, and that's a GO.

03 18 35 25 LMP Okay, it's there? Okay, VERB 40, NOUN 20, ENTER. Okay, Gumdrop, ATTITUDE HOLD is no longer required, and anytime you get a chance, get an 0620 and give us a MARK when you do.

03 18 35 48 CMP Roger. 3, 2, 1 -

03 18 35 51 CMP MARK.

03 18 35 52 LMP Okay, give us another 3, 2, 1, MARK.

03 18 35 55 CMP 3, 2, 1 -

03 18 35 57 CMP MARK.

03 18 35 58 LMP Okay, now readout.

03 18 35 59 CMP Okay, 14735, 28980, 34653.

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03 18 36 14 LMP Let me see if I got those. 14735, 28980, 34653.

03 18 36 24 CMP That's correct.

03 18 36 25 LMP Okay, thank you.

03 18 36 29 CC Spider and Gumdrop, this is Houston through the Mercury. Got you about 4 minutes, and I copied your CSM angles.

03 18 36 36 LMP Okay, you ready for the LM angles?

03 18 36 37 CC Go ahead.

03 18 36 38 LMP Okay, I'm going to HIGH bit rate for you, first; and the LM angles, 15476, 01907, 01305.

03 18 36 54 CC Roger. I'll read those back in just a second. We'd like to have a new memory dump. We're standing by. Anytime, on your MARK.

03 18 37 00 LMP Okay, stand by just 1. Let me finish up the dock line-up procedure, and we'll be right with you.

03 18 37 06 CC Okay, reading back your angles: CSM 14735, 28980, 34653. The LM: 15476, 01907, 01305.

03 18 37 26 LMP UP Charlie. Okay, VERB 25, NOUN 07, ENTER.

03 18 37 32 CMP Houston, Gumdrop.

03 18 37 34 CC Go, Gumdrop.

03 18 37 35 LMP 77, ENTER.

03 18 37 36 CMP ... torquing angles, if you're ready.

03 18 37 39 CC I'm ready ...

03 18 37 41 CMP Roger. GET - -

03 18 37 42 LMP 10 000, ENTER.

03 18 37 43 CMP - - 03130.

03 18 37 46 LMP 1, ENTER.

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Tape 09-03601

03 18 37 47 CMP - - plus 0109 - -  
03 18 37 49 LMP VERB 1, NOUN 1, ENTER.  
03 18 37 51 CMP - - minus 00363 - -  
03 18 37 55 LMP 77, ENTER.  
03 18 37 56 CMP - - 00193.  
03 18 37 59 LMP Okay, that's verified. VERB 37, ENTER; 51,  
ENTER.  
03 18 38 03 CC ... I copy.  
03 18 38 04 CMP Alrighty.  
03 18 38 08 LMP THROTTLE two. Okay, and VERB 74, and I'll give  
a 3, 2, 1, MARK.  
03 18 38 19 CDR Okay, GO.  
03 18 38 20 LMP Okay, here we come with an E-memory dump, if  
you're ready yet, Houston.  
03 18 38 24 CC And we're ... ready ...  
03 18 38 26 LMP Roger. 3, 2, 1 -  
03 18 38 29 LMP MARK.  
03 18 38 30 LMP E-memory dump.  
03 18 39 06 LMP Okay, we got the E-memory dump, and that was -  
Let me get - I got TELEMETRY, HIGH. Have we  
got INSTRUMENTATION B, CLOSED? Oh, balls, we  
don't.  
03 18 39 18 CDR No, I don't know we need it on yet.  
03 18 39 21 LMP Well, it's supposed to be closed for the E-  
memory dump. Right there.  
03 18 39 25 CDR Wonder why?  
03 18 39 28 LMP Houston, Spider.

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03 18 39 30 CC Go ahead, Spider.

03 18 39 31 LMP Roger. Just noticed that we don't have R&D INSTRUMENTATION B, CLOSED - Or we did not have it closed for that E-memory dump. Do you want to re-do that? Why don't you close it now, Jim?

03 18 39 44 CDR ...

03 18 39 45 CC ... we had a dropout of telemetry, and - Stand by.

03 18 39 51 CDR I'm not sure that the - -

03 18 39 52 CC ... in regard to circuit breaker. Let us have the E-memory dump.

03 18 39 55 LMP Okay, understand. A negative on the R&D B, and another E-memory dump. 3, 2, 1 -

03 18 40 02 LMP MARK.

03 18 40 03 LMP And, if you would, please remind us to get that R&D B in at some later date.

03 18 40 10 CC Houston ...

03 18 40 11 CDR It's in the flight plan right up here.

03 18 40 13 CC We're not going to get it here. We'll see you over Antigua at about 03. Spider, give us LOW bit rate if you read.

03 18 40 22 LMP Roger; LOW bit rate - -

03 18 40 24 CDR Yes, we showed a DFI VHF B ON at - over Antigua.

03 18 40 29 LMP Yes, okay. Well, I'm not sure, Jim; it's in the checklist, but I'm not sure whether a - because of the E-memory -

03 18 40 32 CLR Yes. I think it's just - that ...

03 18 40 35 CC Gumdrop, Houston. If you still read me, we didn't give you a NAV checkup, but your - we

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Tape 09-03601

pulled a vector compare, and it's real good  
and we are going to disregard it.

03 18 40 44 CMP Gumdrop, Roger. Understand.

03 18 40 52 CDR Well, we're all through with all of our checks,  
except - -

03 18 40 57 LMP Gimbal drive.

03 18 40 58 CDR - - frantic pass.

03 18 40 59 CMP ... hours. Is that affirm?

03 18 41 04 LMP Except the landing what?

03 18 41 06 CDR Except the frantic pass.

03 18 41 08 LMP Oh.

03 18 41 09 CDR Antigua, Canaries, and -

03 18 41 12 LMP Oh, we ought to be in good shape for that, too.

03 18 41 13 CDR Yes. We do a PIPA BIAS check here.

03 18 41 18 IMP Yes. Okay, let's do that. Where is it?

03 18 41 21 CDR A REG check, too.

03 18 41 22 LMP Oh, we got to do that damned REG check. PIPA  
BIAS check. Why don't we do that while we're  
playing with the DSKY?

03 18 41 34 CDR Yes, then we'll get the REG check right after  
that. Then I think -

03 18 41 43 IMP Gumdrop, Spider.

03 18 41 44 CDR Yes, that's alright. Okay.

03 18 41 46 CMP Go.

03 18 41 47 IMP Roger. Are you in FREE?

03 18 41 48 CMP I'm there, yes.

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03 18 41 49 LMP And are your rates less than 0.1?

03 18 41 51 CMP Let me - let me ...

03 18 41 56 LMP Okay. ... a few little tweaks.

03 18 42 03 CMP ...

03 18 42 05 LMP Okay, we'll advise when we've done our PIPA BIAS check for you.

03 18 42 09 CMP Okay.

03 18 42 14 LMP Okay, VERB 25, NOUN 21, ENTER.

03 18 42 21 CDR ... took a big step.

03 18 42 27 LMP Okay, ENTER, ENTER, and give me a MARK when you hit the third one.

03 18 42 31 CDR Ready, 3, 2, 1 -

03 18 42 33 CDR MARK.

03 18 42 38 LMP Okay, VERB 6, NOUN 21, ENTER.

03 18 42 53 LMP Okay, hit it again at 32.

03 18 43 07 LMP Okay, stand by. Okay, Gumdrops, you're clear to do anything you want. We're done with the BIAS check.

03 18 43 14 CMP ...

03 18 43 15 LMP Okay, that's different from the other day, isn't it?

03 18 43 17 CDR It is.

03 18 43 18 LMP Plus 05, plus 01, and plus 01.

03 18 43 27 CDR That's a nine.

03 18 43 29 LMP Hey, it's a nine. Thank you. Okay, do a VERB 06, NOUN 1, and let's look at it. 1452. It was 12 before - -

03 18 43 51 CDR ...3.

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03 18 43 52 LMP Okay, so we can alter that one, and that - that was a minus 3; that's now a plus 1. Okay, and let's do an ENTER; 1456, ENTER and check the other one.

03 18 44 03 CDR Okay. ...

03 18 44 09 LMP That was a plus 1, and it's still a plus 1. Good old Z ... Okay, so we want to change X and Y. Okay, VERB 21, NOUN 1, ENTER. 1452, ENTER.

03 18 44 30 LMP Plus - -

03 18 44 31 CDR 09, ENTER.

03 18 44 32 LMP 09000, ENTER. ENTER 1454, ENTER. Plus 01000, ENTER. Okay, you want to check the VERB 06, NOUN 1; 1452. Let's see, what was that? That was - that was a plus 12 and a minus 3, wasn't it? And a plus 1?

03 18 45 03 CDR Yes.

03 18 45 09 LMP Okay, got in there. 9045 ...

03 18 45 15 CDR ...

03 18 45 38 LMP Okay, want to do the REG check now?

03 18 45 40 CDR Yes, we might as well. That's the only other thing that looks like it's going to fit up there. Boy, I hate to do that damn thing.

03 18 45 47 LMP Oh, and an AGS CAL we can do too. Well, we might as well wait until they give us the torquing angle.

03 18 45 53 CDR Yes, yes. Let's do the regulator check.

03 18 45 55 LMP Oh hey, I can do the AGS initialization. Let me go ahead and get that thing going.

03 18 45 59 CDR Let's - no - let's get the REG check out of the way. We've got just about enough time to fit it in here.

03 18 46 03 LMP Okay.

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03 18 46 04 CDR I'd like to see it gone.

03 18 46 08 LMP Okay, I'll tell you what. I'm going to be off - hell, I don't know if I want to be off the loop. Oh, we don't pressurize on this one. Okay, I'm going to be on the loop.

03 18 46 25 LMP Gumdrop, Spider.

03 18 46 28 CMP Spider.

03 18 46 29 CDR Roger, we're going to come up with our infamous bang again here in a few minutes.

03 18 46 33 CMP I'm holding my breath.

03 18 46 36 LMP You made a few yourself today.

03 18 46 38 CMP Say again?

03 18 46 39 CDR I say, you made a few bangs yourself today.

03 18 46 41 CMP Oh, really. When?

03 18 46 43 LMP You were making those docking latches.

03 18 46 46 CMP ... I was checking a couple of them out there. They - one of them was a little sticky, but it works fine.

03 18 46 52 LMP Okay, going off the air here, and you'll hear a bang in probably about 5 minutes. Okay.

03 18 46 59 CDR Gumdrop, is the tunnel depressed yet?

03 18 47 01 CMP Roger, tunnel's depressed, and I have a good hatch ... check, and the ... and everything looks good.

03 18 47 07 CDR Okay, very good.

03 18 47 12 CDR Okay. Tunnel hatch is closed, depress - CABIN GAS RETURN to EGRESS.

03 18 47 15 LMP EGRESS. Crazy!

03 18 47 18 CDR CABIN DEPRESS to AUTO.

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Tape 09-03601

03 18 47 19 LMP CABIN REPRESS is in AUTO.

03 18 47 23 CDR Okay, PRESS REG B to EGRESS.

03 18 47 25 LMP PRESS REG B to - going to EGRESS. Okay.

03 18 47 32 CDR Okay, FORWARD CABIN DUMP valve, OPEN, and then AUTO at 4 - -

03 18 47 34 LMP You know that's a bad way to do that. Yes.

03 18 47 38 CDR Why?

03 18 47 39 LMP Well, it could shut off all the flow in the suit.

03 18 47 41 CDR Well, it's not so bad.

03 18 47 42 LMP Ha!

03 18 47 43 CDR Let me open up the -

03 18 47 46 LMP Okay, now I want to go REG A to CLOSE when the CABIN REPRESS starts.

03 18 47 50 CDR ...

03 18 47 51 LMP Okay, go ahead. You watching it today too, huh? Yes, okay.

03 18 48 05 LMP Here it goes. Okay, we got the MASTER ALARM; I'll get that. Okay.

03 18 48 11 CDR Okay. As soon as CABIN REPRESS starts, PRESS REG A, CLOSE; CABIN WARNING LIGHT, OFF; CABIN REPRESS stops; it does.

03 18 48 20 LMP Alright.

03 18 48 21 CDR CABIN REPRESS, CLOSE.

03 18 48 24 LMP REPRESS going to CLOSE, here we go. Bang.

03 18 48 27 CDR Okay, FORWARD CABIN DUMP valve OPEN, and then AUTO at 3.5.

03 18 48 32 LMP Okay.

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03 18 48 33 CDR You're going to have to read this one to me

03 18 48 36 LMP You want me to read this one to you?

03 18 48 37 CDR No, tell me when we get to 3.5.

03 18 48 38 LMP Oh, okay, yes.

03 18 48 40 LMP Okay 3.6, 3.5 now.

03 18 48 42 CDR Okay.

03 18 48 44 LMP Okay. The suit's at 4.2.

03 18 48 48 CDR Alrighty. And - -

03 18 48 53 LMP Get that big noise bank pushed out. (Laughter)  
Okay.

03 18 48 56 CDR That's a piece of our ECF.

03 18 48 58 LMP What is it?

03 18 48 59 CDR I don't know.

03 18 49 00 LMP If it's nonconductive, let's put it up through  
the ceiling.

03 18 49 04 CDR Oh, shoot.

03 18 49 05 LMP Okay, go ahead.

03 18 49 07 CDR ... little bag.

03 18 49 09 LMP Okay, OPEN then AUTO at 3.5. PRESS REG B, CLOSED.  
Oh, wait a minute. Okay, let me open it up and  
bring the suits down. Here we go. Okay, we're  
all the way down. REG B to CLOSE.

03 18 49 25 CDR Yes.

03 18 49 26 LMP Okay. Here goes the MASTER ALARM. Okay, you want  
to get that? I'll get it, yes.

03 18 49 31 CDR ... get that.

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Tape 09-03601

03 18 49 34 LMP Okay. Well, let's see, SUIT CIRCUIT RELIEF, OPEN, then AUTO at 3.5; you've already done that. PRESS REG B to EGRESS. B to EGRESS, hell, we already did that. Okay, we're going back up.

03 18 49 50 CDR Okay, now PRESS REG B to CLOSE.

03 18 49 53 LMP Going back to CLOSE.

03 18 49 55 CDR SUIT CIRCUIT RELIEF to OPEN.

03 18 49 58 LMP Okay, coming down.

03 18 50 01 CDR ... suit pressure's 3.5.

03 18 50 03 LMP Okay.

03 18 50 04 CDR PRESS REG B to EGRESS.

03 18 50 05 LMP A, we just did B, Jim.

03 18 50 07 CDR Yes, I said A, didn't I?

03 18 50 08 LMP No, you said B. Okay, A comes ...

03 18 50 09 CDR PRESS REG A to EGRESS.

03 18 50 17 LMP Okay, pressure's coming up.

03 18 50 19 CDR That's a slow one.

03 18 50 20 LMP Yes, it is, isn't it? Okay.

03 18 50 23 CDR ... CABIN REPRESS to AUTO.

03 18 50 25 LMP Oh, here we go. Okay.

03 18 50 29 CDR Okay, PRESS REG B to CABIN.

03 18 50 31 LMP Here's where we come up.

03 18 50 53 CDR PRESS REG A, CABIN.

03 18 50 54 LMP REG A, CABIN.

03 18 50 56 CDR CABIN GAS RETURN to AUTO.

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03 18 50 57 LMP CABIN GAS RETURN to AUTO.

03 18 51 01 CDR SUIT GAS DIVERTER, push to CABIN.

03 18 51 04 LMP SUIT GAS DIVERTER, push to CABIN.

03 18 51 06 CDR Okay, and that's it.

03 18 51 07 LMP Let me just check everything.

03 18 51 12 LMP Okay, it all looks good.

03 18 51 14 CDR Okay.

03 18 51 15 LMP Crazy. Okay, now I'll set my AGS start. How you like that, Davie?

03 18 51 22 CMP Swell!

03 18 51 27 LMP Okay, our CABIN PRESSURE is - Ohhh, that's okay, good. That too ... Hey, my glove's coming off again.

02 18 51 34 CDR We seem to have lost our Velcro off of there completely.

03 18 51 38 LMP Oh yes. It's probably on the back of my camera. I put my camera on there. Hey, look at those pretty pink ...

03 18 51 47 CDR Yes.

03 18 51 55 LMP Okay, the regulator check we did at 90:46 and 90:52.

03 18 52 22 LMP Okay, I guess the first thing we want is the E-memory dump thing, huh?

03 18 52 26 CDR Yes. Well, we've already done that though, we may not need that.

03 18 52 30 LMP No, they didn't - I don't think they got it last time - again.

03 18 52 35 CDR What makes you think that?

03 18 52 37 LMP I think that they said that they didn't.

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Tape 09-03601

03 18 52 39 CDR That's why we gave them the second one.

03 18 52 40 LMP I know it, but they said they were losing us.

03 18 53 41 LMP That clock's a little bit fast.

03 18 53 55 LMP Not much, but -

03 18 54 15 LMP What are we - one REV ahead?

03 18 54 20 CDR Not quite, we're about ... The AGS initialization would be in about an hour from now. No, it wouldn't either. It'll be in about 30 minutes from now. We're running about 30 minutes ahead.

03 18 54 46 CDR ... look like? Great!

03 18 54 58 LMP Okay, so what do we want to do here, now?

03 18 55 02 CDR Well, we want -

03 18 55 03 LMP We want to see if they need an E-memory dump, I guess.

03 18 55 07 CDR Yes, E-memory dump and then I want - to get the DPS GIMBAL DRIVE and final check all set up. We're back there.

03 18 55 15 LMP And we've also got to get the up - update.

03 18 55 17 CDR Yes, that's the big thing.

03 18 55 20 LMP Yes.

03 18 55 21 CDR You got to read the IMU gi - gimbal angles down at MCC?

03 18 55 25 LMP We've already read them.

03 18 55 28 CDR Yes, I guess we got those down over the -

03 18 55 29 LMP Yes.

03 18 55 30 CDR - after the alignment after all. Okay. CD update. That's gimbal drive and throttle check. I guess we'd better get that.

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03 18 55 44 LMP Yes, okay. You want a setup for that?

03 18 55 45 CDR Yes.

03 18 55 46 LMP Okay, THROTTLE CONTROL to MANUAL.

03 18 55 47 CDR Just a second. Let me find it here.

03 18 55 50 CDR What page is it on?

03 18 55 52 LMP Rendezvous 24.

03 18 56 09 CDR Okay. Rendezvous 24. Then you want the THROTTLE CONTROL to MANUAL. Go ahead.

03 18 56 17 LMP Okay, stand by, okay, MANUAL THROTTLE to SYSTEMS ENGINEER.

03 18 56 22 CDR Okay.

03 18 56 23 LMP TTCA, both, throttle up, MINIMUM. Okay, that's as far as we can go. Now, I guess we can do the VERB 48, and we can be sitting right there ready to - well, but we don't know if they want to do the E-memory dump first.

03 18 56 52 CDR Yes. Let's just leave it right here.

03 18 56 53 LMP Yes, then we just go back into POO here.

03 18 57 29 LMP Hey, is that OPS ... on pretty good today?

03 18 57 32 CDR I've got it on the same way I had it on yesterday with that piece of Beta-cloth netting hooked around the handle, so I hope it doesn't come out.

03 18 57 40 LMP Okay, well, we don't ever - Oh! The ascent engine burn light. ...

03 18 57 54 LMP For as little sleep as we got, I feel pretty damned good.

03 18 57 57 CDR Yes, me too. I'm getting hungry. Getting hungry!

03 18 58 19 CDR I've only been up 4 hours.

03 18 58 21 LMP Have we?

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Tape 09-03601

03 18 58 23 CDR Yes.

03 18 58 24 LMP Is that all? Not bad. Let's see. Where are we here.

03 18 58 28 CDR ... 86:40 we got up.

03 18 59 27 LMP Rendezvous radar. We ought to get that damned thing undone.

03 18 59 31 CDR Yes, that comes - ... as we leave there, we can take and - ... thing is really printed neatly.

03 18 59 42 LMP Hey, we want to get R&D B in now, Jim? Past that ...

03 18 59 45 CDR Yes, when we come up on -

03 18 59 46 LMP Are we passed that time?

03 18 59 47 CDR No, we have about another 5 minutes to go.

03 18 59 51 LMP Oh, okay. You want to unstow that radar and slew it around?

03 18 59 56 CDR Well, why don't we do it after we finish this pass? We got all this time here -

03 18 59 59 LMP Fine.

03 19 00 00 CDR Run a self-check on -

03 19 00 01 LMP I figured we could play with it for awhile.

03 19 00 02 CDR Run a ... check on stuff; and then when we come down here, we'll run another one.

03 19 00 06 LMP Okay. How are you doing, Gumdrop?

03 19 00 15 CMP Fine ...

03 19 00 16 LMP Okay. We're well up on the timeline here. This is our wild pass coming up; and after this, we need to do our AGS CAL, we've got to disable the B-3 thruster and do our rendezvous radar check and all that stuff.

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03 19 00 31 CMP Okay. I'm - right up with you by about 3 minutes.

03 19 00 39 LMP Three minutes? What's he talking about there?

03 19 00 42 CDR Well, he's probably following in the flight plan. He's probably one step behind us.

03 19 00 45 LMP Oh.

03 19 01 04 LMP Here, let me see if we bypassed anything now.

03 19 01 39 LMP Okay, we've got everything up to this time.

03 19 01 44 CDR Yes, that was my conclusion, too.

03 19 02 06 LMP Okay, you want to rehydrate some food?

03 19 02 10 CDR Well, we're just about at that pass. Why don't we go through the pass. When we finish it, at least get a drink. ... finish out that AGS initialization, AGS CAL - Well, we've got the AGS initialization, haven't we?

03 19 02 23 LMP Well, no, - -

03 19 02 24 CDR ... No, we've got to update the state vector yet.

03 19 02 25 LMP - - we had an update -

03 19 02 31 CDR Take my helmet and gloves off and get a drink, anyway.

03 19 02 50 LMP I'll tell you what. Hey, I'm going to put my window heater on.

03 19 02 54 CDR Okay, why, you getting steamy?

03 19 02 55 LMP Oh, I can see a little bit of fog in there and I don't know whether it's -

03 19 03 13 LMP Gummy must be thrusting.

03 19 03 20 CDR Yes.

03 19 03 27 LMP Hate to see him thrust around very much just on the capture latches.

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Day 4 - Page 93  
Tape 09-03601

03 19 03 32 CDR (Laughter) He's supposed to hold it.

03 19 03 36 LMP Yes. I know.

03 19 03 44 CMP Gumdrop, 5 square.

03 19 03 48 CDR Oh, shoot.

03 19 03 49 LMP They're - they're coming now.

03 19 03 52 CDR I don't hear them. Do you hear them?

03 19 03 53 LMP No, just a minute, let me switch antennas. Here they are.

03 19 03 59 CMP Spider, Gumdrop, Houston's on the line, and they say as soon as they get data, they're going to do the E-memory dump again.

03 19 04 03 LMP Roger. We're ready.

03 19 04 06 CC Okay, Spider, do you read Houston?

03 19 04 09 LMP Sure do.

03 19 04 10 CDR Roger, Houston, reading you now.

03 19 04 12 CC Okay, while we are waiting on that E-memory dump, let me give you your torquing angles.

03 19 04 17 LMP Roger. Ready to copy.

03 19 04 19 CC Roger, torquing angles: minus 00370, minus 00790, minus 00310.

03 19 04 34 LMP Roger. Read back: minus 00370, minus 00790, minus 00310.

03 19 04 45 CC Roger, copy; and we'd like to have HIGH bit rate.

03 19 04 49 LMP Roger. HIGH bit rate.

03 19 05 04 CDR Houston, did you find out anything about that AGS warning light yet?

03 19 05 07 CC Roger, we're working on that, and we'll probably have a procedure for you that might solve the

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problem - probably to turn it off and back on again; but we'll pass you the details later.

03 19 05 21 CDR Okay.

03 19 05 35 LMP The VERB 42.

03 19 06 18 LMP ... say again?

03 19 06 23 CC Spider, this is Houston. We aren't getting CSM data. We're getting no data from you. You might check the switches, please.

03 19 06 33 LMP Roger, everything is checked out. We are in TELEMETRY HIGH.

03 19 06 39 CDR And Houston, R&D-instrumentation B circuit breaker coming in now.

03 19 06 42 CC Okay, thank you.

03 19 06 52 CC Okay. We've got our data, Spider. We're ready for the E-memory dump on your mark.

03 19 06 56 LMP Roger. 3, 2, 1.

03 19 06 59 LMP MARK.

03 19 07 05 CDR And, Houston, be advised that once again our supercritical pressure doesn't seem to be working for the descent stage.

03 19 07 13 CC I'm sorry, Jim, I couldn't read that. Say again.

03 19 07 15 CDR Roger. The supercritical pressure gage does not seem to be working for the descent propulsion system.

03 19 07 25 CC Roger, copy. Spider, we're reading 704 on the supercrit.

03 19 07 38 CDR Okay.

03 19 07 42 CDR Probably low.

03 19 07 43 LMP Well, we're blowing down anyway.

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Day 4 - Page 95  
Tape 09-03601

03 19 07 45 CDR I know it, but that's still awfully low.

03 19 07 46 LMP Yes.

03 19 07 47 CDR It's going down - -

03 19 07 48 LMP I'll bet that's a big surprise to them all.

03 19 07 49 CDR Yes.

03 19 07 52 CC Okay, Spider, just as soon as the dump is complete, we're ready to uplink your state vector REFSMMAT.

03 19 08 01 CDR Roger. Okay, go ahead.

03 19 08 05 CC Okay. It's on its way.

03 19 08 45 CDR Houston, Spider, we're ready to copy the NAV check if you've got that.

03 19 08 50 CC Roger. Reading the NAV check: 092:00:00 ... 1 ...

03 19 09 37 LMP Broke S-band lock. Houston, you reading Spider?

03 19 09 43 CC Try me again.

03 19 09 45 LMP Okay, Houston. Spider is back on with you now, and I got the time and that's all.

03 19 09 53 CC Roger. Reading: you have the time ... plus 14 ... 1245.

03 19 10 11 LMP Okay, you broke out again. I got the altitude that time. I got minus 027. Say again and all after.

03 19 10 30 CMP Spider, Gumdrop. Houston ... too.

03 19 10 33 LMP Okay.

03 19 10 37 CC Okay, Spider. I've got you now. Try your read-back.

03 19 10 41 CDR I didn't get it. You're breaking up pretty badly, Houston. I got a minus 027, and then you broke out. Say again all after, please.

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03 19 10 53 CC Okay. Starting with the time, 092:00:00, minus 2799, plus 14631, 1245.

03 19 11 14 LMP Roger. 92:00:00 minus 2799, plus 14631, 1245.

03 19 11 26 CC That's affirmative, Spider. Houston confirms the update.

03 19 11 34 LMP Terrible.

03 19 11 36 CDR Yes. We're going to have us a problem; I can see that.

03 19 11 38 LMP Yes. The S-band seems to be on.

03 19 11 54 LMP Did you notice what the first - whether that was a REFSMAT or a state vector?

03 19 11 59 CDR No.

03 19 12 19 CDR That was a state vector.

03 19 12 26 CC ... How do you read me?

03 19 12 30 CDR You're better now, Houston. You're better.

03 19 12 33 CMP Gundrop's 5 by.

03 19 12 35 CC Very good.

03 19 12 47 LMP Come on, baby, get in there. I'd better get an update form ready.

03 19 12 54 CDR Yes.

03 19 13 09 CC Okay, Spider. This is Houston. We've got the state vector in. We have VERB 66ed it, and we're going to hand over here within in a few seconds, and then we'll put in a REFSMAT.

03 19 13 20 LMP Okay. Roger.

03 19 13 34 LMP Okay, there it goes. 24; come on, baby. There we go; 7035. Beautiful. Okay, and it's got to work its way up to 331.

03 19 14 03 CMP Spider, Gundrop. I have a good transponder.

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Day 4 - Page 97  
Tape 09-03601

03 19 14 07 CDR Very good. In just a couple of minutes, we're going to find out if we have a good radar.

03 19 14 13 LMP Okay. We're ready to go the gimbal drive and throttle test. VERB 33, ENTER.

03 19 14 42 CDR Do you have that pad out so that we can verify the stuff in here, when we go through it?

03 19 14 45 LMP Yes. Right here. Say, Houston. Let us know when you're ready for the gimbal drive and throttle.

03 19 15 00 CC Okay, Spider. The computer's yours, and we're ready for your gimbal drive and throttle check. Press ahead.

03 19 15 06 LMP In work. Okay, VERB 48, ENTER. DAP configuration, there; 22145, that's good; 2709, that's good; PRO; ENGINE GIMBAL TRIM, plus 428, plus 730. Okay, MODE CONTROL to AUTO.

03 19 15 27 CDR Okay, MODE CONTROL to AUTO.

03 19 15 30 LMP ENGINE ARM to - ENGINE GIMBAL, ENABLE.

03 19 15 32 CDR ENGINE GIMBAL, ENABLE.

03 19 15 33 LMP ENGINE ARM to DESCENT.

03 19 15 35 CDR ENGINE ARM to DESCENT.

03 19 15 36 LMP Okay. PRO.

03 19 15 39 CDR Okay, Houston. I'm going to start the drive now.

03 19 15 43 CC Roger. Go ahead, Spider. We're ready.

03 19 15 46 CDR Roger. It's going.

03 19 15 50 LMP Okay, we'll monitor it there. Okay, and you're ready for the throttle check.

03 19 15 56 CC That's affirmative, Spider. Go ahead.

03 19 15 59 LMP Roger. LMP's THROTTLE is MINIMUM. Coming up to the SOFT STOP. SOFT STOP is 53 percent. FTP is

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off scale high; RCCA light and back down through the SOFT STOP to IDLE. Okay, MANUAL THROTTLE, COMMANDER.

03 19 16 21 CC Okay, Spider. We copy. Go ahead.

03 19 16 23 CDR Okay, here comes the COMMANDER's THROTTLE.

03 19 16 27 CC Okay, press ahead, Jim. - -

03 19 16 29 LMP Minimum - -

03 19 16 30 CC - - throttle looked good.

03 19 16 31 LMP Keep talking, Jim.

03 19 16 32 CDR We're up to SOFT STOP, full throttle, back down to MIN.

03 19 16 45 LMP THROTTLE CONTROL to AUTO.

03 19 16 47 CC Roger. It looked good. Let's press, and at this time both vehicles can bring up their S-band.

03 19 16 53 CDR Roger.

03 19 16 54 CMP Roger.

03 19 16 59 LMP Okay, stand by. We're about to get the thing finished driving. Okay, and the next step is ENGINE ARM to OFF. There goes one of them. Okay, there goes the other one. Key release. ENGINE ARM to OFF.

03 19 17 24 CDR ENGINE ARM, OFF.

03 19 17 26 LMP TTCA JETS, both DOWN.

03 19 17 30 CDR Okay.

03 19 17 32 LMP PRO. I got that. This says verify final GDA; okay, CB(11), STABILIZATION AND CONTROL, DECA POWER, OPEN. And I've got the DESCENT ENGINE OVERRIDE open.

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Day 4 - Page 99  
Tape 09-03603

03 19 17 42 CC Spider, this is Houston. You're GO on your gimbals and the throttle check. We're standing by for the hot fire.

03 19 17 48 LMP Roger. In work. Okay, Gumbdrop, we're going to be doing our hot fire check here.

03 19 17 54 CDR Damn it; CB(11) here, too.

03 19 17 57 LMP Roger. Did you get it.

03 19 17 58 CDR No. Was that yours or mine.

03 19 18 00 LMP CB(11), DECA POWER, OPEN.

03 19 18 01 CDR Yes, I thought that was CB(11), STAB CONTROL, DESCENT ENGINE OVERRIDE.

03 19 18 04 LMP That's - Okay, I'm sorry; that's a 16. I got it.

03 19 18 07 CDR Okay. Go on. Okay. HIGH bit rate with MSC - Let's see.

03 19 18 12 LMP Okay. We got that. I just told him the quad temps are up.

03 19 18 16 CDR INSTRUMENTATION CWEA, OPEN and RECLOSE.

03 19 18 18 LMP Okay. OPEN and RECLOSE.

03 19 18 23 CDR Okay, GUIDANCE CONTROL to AGS, X-TRANSLATION, 4 JETS, DEADBAND to MAX.

03 19 18 28 LMP Okay, ATTITUDE CONTROL, three, to MODE CONTROL.

03 19 18 31 CDR MODE CONTROL.

03 19 18 32 LMP MODE CONTROL, ATTITUDE HOLD.

03 19 18 33 CDR ATT HOLD.

03 19 18 34 LMP Okay. Deflect your ACA slowly. Roll, pitch, and yaw.

03 19 18 37 CDR Here comes the proportional AGS, Houston.

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03 19 18 40 CC Roger. You're very weak, but we're getting good pickup. Press ahead, Spider.

03 19 18 56 CDR Okay.

03 19 18 57 LMP Okay, three to PULSE - -

03 19 18 58 CDR Wait. Okay.

03 19 18 59 LMP ATTITUDE DIRECT breaker, CLOSE.

03 19 19 02 CDR They're too drifting. Oop. CLOSE.

03 19 19 06 LMP Okay, deflect the hardover, roll, pitch, and yaw.

03 19 19 09 CDR Okay, we want to do the hardover check now?

03 19 19 13 CC Okay, Spider, we're getting data.

03 19 19 28 LMP Okay.

03 19 19 29 CDR Complete.

03 19 19 30 LMP Okay, QUAD 1 - 4, 3, 2, 1, CLOSE.

03 19 19 33 CDR Okay, 4, 3, 2, 1, CLOSE.

03 19 19 37 LMP Okay, I've got all mine closed.

03 19 19 38 CDR Okay.

03 19 19 39 LMP CWEA, OPEN and RECLOSE.

03 19 19 43 LMP Okay.

03 19 19 44 CC Okay, Gumdrop, if - Can you read me?

03 19 19 47 CDR Here we go with the other hot fire now.

03 19 19 49 CMP Roger.

03 19 19 51 CC Okay, Spider's very weak. His data is good, however. Let me - And I would like to remind you that B-3 is still ENABLED.

03 19 19 59 CMP Roger. Spider, Gumdrop. They say your data is still good.

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Day 4 - Page 101  
Tape 09-03601

03 19 20 06 LMP ... read them. And we're going to start the PGNS check here in just a minute. We just did the AGS translation and control check. ... control, PGNS.

03 19 20 16 CC Roger ... loud ... Spider. We're working through Madrid now.

03 19 20 21 CDR Okay, here comes PGNS TTCA's.

03 19 20 25 CC Okay.

03 19 20 37 LMP Who's translating it?

03 19 20 39 CDR It's complete.

03 19 20 44 CDR Okay, 2 JETS.

03 19 20 46 LMP Hey, somebody's keying continuously. Okay. Okay, 2 JETS; DEADBAND, MIN, set the DAP to 01002. Okay, that was at 91:01:18, 91:21.

03 19 21 15 CDR Houston. How do you read Spider?

03 19 21 16 CC Loud and clear, Spider.

03 19 21 18 CDR Okay. What's the trouble with our COMM here?

03 19 21 21 CC I don't know. You got real weak ...

03 19 21 45 CDR Houston, this is Spider. You're unreadable.

03 19 21 51 CC ...

03 19 21 58 CMP ... Spider, he said your tests look real good.

03 19 22 01 CDR Okay, UP.

03 19 22 03 CMP ... LOW bit rate.

03 19 22 04 LMP Roger.

03 19 22 05 CDR LOW bit rate.

03 19 22 06 LMP Got that one.

03 19 22 09 CMP ... up that time.

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03 19 22 11 CMP Yes, I sure would appreciate it if we had better COMM.

03 19 22 14 CC So would I.

03 19 22 18 LMP<sup>o</sup> Okay, that - the NAV check is a GO.

03 19 22 24 CC Gumdrop, ...

03 19 22 28 CMP Negative.

03 19 22 30 CC Okay, thank you.

03 19 22 31 CMP Should I have?

03 19 22 32 LMP RESET that damn heater light again.

03 19 22 33 CC No ... cycle ... whether you got it or not.

03 19 22 40 CMP Okay..

03 19 22 43 CDR IMU fine align; we've done that.

03 19 22 46 LMP Yes, I think we've got everything done up to the AGS CAL.

03 19 22 49 CDR Yes. AGS initialization, too.

03 19 22 52 LMP Yes. Let's do that, and I'll get into HIGH bit rate again. I don't think we're supposed to go back to LOW - Oh, that's alright. I'll go to HIGH bit rate now, and we'll do that. Yes.

03 19 23 03 CDR Okay, Gumdrop, this is Spider. You can start getting us into our AGS CAL attitude now.

03 19 23 08 CMP Okay, Roger.

03 19 23 26 CDR AGS calibration.

03 19 23 29 LMP Okay, I'm getting that.

03 19 23 30 CDR ... regulator checks; landing radar self-test.

03 19 23 46 CDR I want to bring the rendezvous radar on the line here. Hey, Gumdrop, would you disable your P-3 thruster? We're going to unlimber the radar here.

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Day 4 - Page 103  
Tape 09-03601

03 19 24 02 CMP Roger, P-3 disabled.

03 19 24 03 CDR Roger. Thank you. Okay, veri -

03 19 24 07 LMP You know something? That COMP activity light - -

03 19 24 09 CDR Check - check your transponder. It'll be off too, please.

03 19 24 11 CMP Roger. Transponder is OFF.

03 19 24 14 LMP - - that COMP activity light stays on a long while; I'm wondering if they gave us a state vector that's more than one REV ahead.

03 19 24 24 CDR They can do it more than - more than one REV ahead, just can't give it more than one REV behind.

03 19 24 27 LMP But this integrates it one REV back. That's the point.

03 19 24 32 CDR Oh.

03 19 24 34 LMP I'm going to ask them about that, next station.

03 19 24 36 CDR Okay, You want to do the radar now?

03 19 24 39 LMP Yes, let's do the radar now.

03 19 24 41 LMP Okay, the update went across when we checked the orbit. 127.1 by - Hey, Jim. It didn't flash, did it?

03 19 24 55 CDR No. I guess it hasn't.

03 19 24 57 LMP How about hitting the key release? Why don't you wait until it - 127.1 by 119.7. Wow! Okay, there it goes. Okay.

03 19 25 22 CDR Okay, RENDEZVOUS RADAR coming to RELEASE.

03 19 25 24 LMP Okay, hey, how about - Wait a minute. Before you do that, let's look through the - Let me look through here when you do it, or do you want to look through it when you do it?

03 19 25 30 CDR Go ahead and look through.

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03 19 25 32 LMP Alright, let me get it in FORWARD. Okay, FORWARD.

03 19 25 41 CDR Go.

03 19 25 44 LMP Son of a gun never blinked. Okay, now you want to - Let's see, what's next. Wait, here I am. CROSS POINTERS, both HIGH MULTIPLIER. If that isn't the most sterling update to the AGS I've ever seen.

03 19 26 04 CDR Yes. Okay, let's see. HIGH MULT. Okay, I'm in HIGH MULT.

03 19 26 09 LMP RATE/ERR MONITOR to RENDEZVOUS RADAR.

03 19 26 11 CDR RENDEZVOUS RADAR.

03 19 26 13 LMP ATTITUDE MONITOR, both to PGNS.

03 19 26 14 CDR ATTITUDE MONITOR, both to PGNS; MODE SELECT to LANDING RADAR; RANGE and RANGE RATE; SHAFT and TRUNNION, 50 scale; RENDEZVOUS RADAR to SLEW.

03 19 26 25 LMP We want to remember to go back to RANGE and RANGE RATE.

03 19 26 28 CDR TEMP MONITOR, 10 to 150. Okay?

03 19 26 34 LMP Okay.

03 19 26 35 CDR AC BUS A, RENDEZVOUS RADAR circuit breaker, IN.

03 19 26 41 LMP Okay. It - it wiggled back and forth, but it stayed in the same place.

03 19 26 54 LMP Do you get a SLEW to 000 next?

03 19 26 56 CDR As soon as I push in the circuit breaker, yes.

03 19 26 58 LMP Yes. Okay, I'll watch you while - You do that in high, right? Yes. Okay, I'll watch you while you do that.

03 19 27 14 CDR Okay, RENDEZVOUS RADAR circuit breaker coming IN.

03 19 27 17 LMP Boing! Okay, it oscillated a little bit and moved about 10 degrees, okay.

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Day 4 - Page 105  
Tape 09-03601

03 19 27 20 CDR It's never going to come on here, no way.

03 19 27 22 LMP It's moving sooth. Very smooth. You're going to get the switch - right now. It's coming around to zero zero. I can't believe it. It's zero now. Did that agree pretty well?

03 19 27 45 CDR Well, you're a little off, but (laughter) not bad.

03 19 27 49 LMP Okay.

03 19 28 06 LMP Okay, you're verifying up, down, left, right, and high and low SLEW, right?

03 19 28 11 CDR Yes.

03 19 28 13 LMP Okay, RENDEZVOUS RADAR to AUTO TRACK, when you're done there.

03 19 28 25 CDR Okay, AUTO TRACK.

03 19 28 27 LMP Okay, AUTO TRACK. RADAR TEST to RENDEZVOUS.

03 19 28 30 CDR RADAR TEST to RENDEZVOUS.

03 19 28 33 LMP Okay, all the tapes ..., read me the ACC's.

03 19 28 36 CDR Okay, 1.6, TRANSMITTER POWER is 3.1, SHAFT ERROR is 2.2 to 2.6, TRUNNION ERROR is 2.3 to 2.5.

03 19 28 52 LMP Okay, RENDEZVOUS RADAR to SLEW. It doesn't say to wait until it locks on.

03 19 28 59 CDR Power's locked on.

03 19 29 00 LMP Okay, RENDEZVOUS RADAR to SLEW. Slew the antenna to zero zero again.

03 19 29 05 CDR Right.

03 19 29 10 LMP Okay, and I'll get this ready.

03 19 29 16 CDR Okay. Zero zero.

03 19 29 18 LMP Okay. LGC.

03 19 29 32 CDR LGC.

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03 19 29 34 LMP Okay, PRO.

03 19 29 36 CDR Go.

03 19 29 37 LMP VERB 62, ENTER, rather, PRO. Okay, it's oscillating.

03 19 29 45 CDR Okay, that doesn't show anything. Let's go to the next one.

03 19 29 47 LMP Okay. PRO. Okay, here it is. 195.75 - -

03 19 29 52 CDR 5.75, minus 495.

03 19 29 56 LMP - - minus 495. And what do you read on the tape?

03 19 29 59 CDR 493 1/2?

03 19 30 04 LMP And - -

03 19 30 05 CDR We want to stop driving your - range yet.

03 19 30 26 LMP Oh, boy! 195 point what?

03 19 30 27 CDR 195.5.

03 19 30 31 LMP Okay, VERB 34, ENTER. RADAR TEST, OFF.

03 19 30 36 CDR Okay.

03 19 30 37 LMP Okay, and a VERB 41, NOUN 72, ENTER. And we'll wait until that disappears. Looks like - Okay, here we go. You want to watch this out the window or just on the needles?

03 19 30 55 CDR Yes, I'll watch on the needles.

03 19 31 08 LMP Okay, are we at plus or minus 50?

03 19 31 10 CDR Yes.

03 19 31 13 LMP Okay, ready?

03 19 31 14 CDR Go.

03 19 31 19 LMP My God, it's right on the money.

03 19 31 21 CDR Okay. Go.

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Day 4 - Page 107  
Tape 09-03601

03 19 31 22 LMP Alright.

03 19 31 23 CDR Keep going.

03 19 31 25 LMP Okay, VERB 16, NOUN 72, ENTER. Okay, that's good.  
VERB 44, ENTER.

03 19 31 37 CDR Okay, VERB 41, NOUN 73, ENTER. I'll get that.

03 19 31 41 LMP ... NOUN 72, ENTER.

03 19 31 44 CDR Minus 00400, ENTER.

03 19 31 45 LMP Minus 00 - -

03 19 31 48 CDR 400.

03 19 31 49 LMP - - 400, ENTER.

03 19 31 50 CDR Okay, minus 00400.

03 19 31 53 LMP Okay, ready?

03 19 31 54 CDR Go.

03 19 31 55 LMP Okay, I'm going to get a plus or minus 5 when it  
comes through zero there.

03 19 31 56 CDR Right. My goodness, that was too smooth. Okay.

03 19 32 05 LMP VERB 16, NOUN 72, ENTER. Okay, it's close. It's  
not right on it; but that's the closest we get.

03 19 32 14 CDR Okay. That's pretty good. Okay.

03 19 32 18 LMP Okay, VERB 44, ENTER, on that. Okay.

03 19 32 26 CDR VERB 41, NOUN 72, and all zips.

03 19 32 28 LMP ... 1, NOUN 72, ENTER, ENTER, ENTER. You ready?

03 19 32 33 CDR Go.

03 19 32 35 LMP Oh, there it is to zero. And mine is pretty damn  
good.

03 19 32 41 CDR Mine isn't.

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03 19 32 42 LMP It isn't?

03 19 32 43 CDR No, that figures. I'll ease off a little, too.  
Okay.

03 19 32 49 LMP Okay?

03 19 32 50 CDR Yes.

03 19 32 51 LMP Okay, now look, I'm going to go down to the 278  
and see if that's the right position for the AOT  
sightings.

03 19 32 55 CDR Okay.

03 19 32 56 LMP Okay. VERB 44, ENTER. Okay, here you go, VERB 41,  
NOUN 72, ENTER. Plus 00000, plus ... 300, ENTER.

03 19 33 09 CMP ... range ...

03 19 33 15 CDR Okay, Davey.

03 19 33 16 LMP Hey, you want to watch it, Jim?

03 19 33 18 CDR Shit.

03 19 33 19 LMP You can tell me whether it goes too far or not  
far enough.

03 19 33 24 CDR Go.

03 19 33 25 LMP Okay?

03 19 33 26 CDR Go.

03 19 33 35 CDR That's fine.

03 19 33 36 LMP That's fine?

03 19 33 37 CDR Yes.

03 19 33 39 LMP Okay.

03 19 33 40 CDR Oh boy, is there a crop on that telescope! Whoeee!

03 19 33 41 LMP Really?

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Day 4 - Page 109  
Tape 09-03601

03 19 33 43 CDR Yes.

03 19 33 44 LMP Let me see it. Oh, and the EVA - Oh, well it's not going to be there. There's a black spot.

03 19 33 52 CDR That's great.

03 19 33 53 LMP Okay, VERB 44 - Let me check the VERB - 16, NOUN 72, ENTER. That's good. VERB 44, ENTER. Okay, now I'm going to put it to the 323 here.

03 19 34 06 CDR Okay.

03 19 34 07 LMP VERB 41, NOUN 72, ENTER. Plus all zeros.

03 19 34 14 CDR All zeros.

03 19 34 15 LMP ENTER, plus 323 - -

03 19 34 16 CDR ENTER, plus 32300.

03 19 34 18 LMP - - 00, ENTER.

03 19 34 20 CDR Go.

03 19 34 22 LMP PRO. VERB 16, NOUN 72. Okay, it's there. PGNS, RENDEZVOUS RADAR, OPEN, and then the AC. Oh, damn it!

03 19 34 36 CDR Leave it OPEN.

03 19 34 38 LMP Doggone it. I wanted to see if it stayed there when we did that.

03 19 34 42 CDR Ah! Okay, let's press on with the card here.

03 19 34 52 LMP ... rendezvous radar check - -

03 19 34 53 CDR Want to check the AGS? I've got the AGS calibration ready to go.

03 19 34 58 LMP ... trans ...

03 19 34 59 CDR Oh, shoot, you're breaking up now.

03 19 35 02 LMP No, I turned it down a little bit. Gumdrops, how do you read?

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03 19 35 06 CMP 5 by.

03 19 35 07 LMP Did you get - We're done with our rendezvous radar checks, and you can activate your transponder ...

03 19 35 12 CDR Oh, wait a second; Gumdrops. Leave it off for a while. We may have to run this again. They want this run over a station. I wanted to run it to see how it worked.

03 19 35 18 CMP Okay. I'll leave it off.

03 19 35 20 CDR Okay, let's remember that.

03 19 35 21 LMP Yes.

03 19 35 23 CDR Let's run the AGS initialization, AGS CAL.

03 19 35 26 LMP Okay.

03 19 35 28 CDR We're going to start running that AGS CAL here in just a minute, Dave.

03 19 35 30 CMP Okay.

03 19 35 31 LMP You want to verify those?

03 19 35 39 CDR Hey, we're pretty close to - in one of our gimbal angles. Yes.

03 19 35 47 CDR/LMP Both of them.

03 19 35 49 CMP Are you really?

03 19 35 50 CDR Yes. We're at 275 on one.

03 19 35 52 LMP Yes, all of them are that way.

03 19 35 53 CMP Heck, I'm not even that close.

03 19 35 57 CDR Uh oh. Yes, one of them is 17 degrees off; that's not bad. The other's 13 degrees off, and the other's 5.

03 19 36 06 LMP Okay, Gumdrops, this is because of that 90 degree rotation again, I think.

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Day 4 - Page 111  
Tape 09-03601

03 19 36 11 CMP Yes. You see, I'm sitting on - sort of a 22 degree - degree offset from 000 inertially.

03 19 36 20 LMP We're - we're not in good shape over here.

03 19 36 23 CDR Okay, we've got to make one of them change. It's going the wrong way right now.

03 19 36 29 LMP Okay, that one's okay. Let's see, that's - outer - which is - Where do we want to be? That one's okay, isn't it?

03 19 36 40 CDR No, that's the one that's wrong. That's the 90-degree mark right now.

03 19 36 44 LMP Oh, yes, okay. Let's see that's R, roll, so that's going to be closest to his - -

03 19 36 50 CDR His yaw.

03 19 36 51 LMP - - yaw, okay.

03 19 36 52 CDR Check your yaw.

03 19 37 01 CDR Dave, are you yawing at all?

03 19 37 03 CMP Yes, Roger, I'm trying to go the way you are saying.

03 19 37 05 CDR Okay, fine. Okay, we've got that number increasing now so -

03 19 37 09 CMP That's the best way to go, huh?

03 19 37 11 CDR Yes.

03 19 37 16 LMP Check. They're all going the right way, and we'll let you know when we get there.

03 19 37 26 CDR Lighting check.

03 19 37 27 CMP How about doing a landing radar self-check while we're waiting.

03 19 37 30 CDR Yes.

03 19 37 31 LMP Can't do that though. We got to do the lighting check at night.

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03 19 37 34 CDR Yes. We also have to do the landing radar self test over a ground station.

03 19 37 37 LMP Oh, okay.

03 19 37 38 CDR You want to get me a drink of water, maybe, and a -

03 19 37 42 LMP Okay. Let me see how the rendezvous radar - Okay, it came up to 40.

03 19 38 11 LMP Tell you what, I'm going to do another AGS update here, while we're waiting.

03 19 38 20 CDR Okay.

03 19 38 26 CMP How you doing?

03 19 38 30 LMP We're - we're 5 degrees; we got to go another - about another 10 degrees at least in - in your yaw.

03 19 38 40 CMP Roger.

03 19 39 09 CDR How are the optics looking, Dave?

03 19 39 11 CMP ...

03 19 40 04 LMP Okay, it's 124 by 128 now, so that's a lot better.

03 19 40 06 CDR Okay.

03 19 40 13 CMP Are they in the ball park?

03 19 40 16 LMP ... standby.

03 19 40 23 CDR Okay, we have about 3 - we really have at least 3 more degrees in the direction that you're going.

03 19 40 30 CMP Okay.

03 19 40 43 LMP How are those doing? Okay that's 19 and 20 -

03 19 40 45 CDR They're doing great.

03 19 40 49 LMP Okay, yes.

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03 19 40 52 CDR Well, we're right back on the time line again. No matter now - how you hop to get ahead, you just can't get ahead.

03 19 41 25 CDR How's everything running over there, Dave?

03 19 41 28 CMP Everything's running just fine. Nothing at all seems off nominal. I don't know where they get their caution and warning idea, but everything seems inside the limit. Well within sight.

03 19 41 38 CDR Okay, what he said was that one - that hydrogen fan came on, and they thought maybe you might have gone down below the limit, like it had been.

03 19 41 43 CMP No, it stayed right in the middle. Right there.

03 19 41 46 CDR Boy, that COMM is terrible.

03 19 41 49 LMP Sure is.

03 19 41 59 CDR Okay, Dave, can you kill everything but your yaw rate and leave just a little bit in the same direction you are going in now.

03 19 42 08 CMP Okay.

03 19 42 30 CMP ... I got 0.05 in yaw directional ...

03 19 42 34 CDR Okay, good.

03 19 42 36 LMP Balls, I'm sitting here sleeping.

03 19 43 26 LMP Okay, we're going to do a VERB 40, NOUN 20.

03 19 43 43 CDR I'm checking out the ORDEAL, in case you see my ball wiggling around.

03 19 43 45 LMP Okay. Okay, Dave, you want to disable all your thrusters?

03 19 43 50 CMP Okay, going FREE.

03 19 43 54 LMP Okay, and we're starting the CAL now.

03 19 43 57 CMP Okay.

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03 19 45 05 LMP Bias has stayed exactly the same.

03 19 45 08 CDR The other one did?

03 19 45 09 LMP No, all of them - -

03 19 45 10 CDR Oh, good.

03 19 45 11 LMP - - stayed exactly the same.

03 19 45 12 CDR Good.

03 19 45 21 LMP ... do that landing radar self-test?

03 19 45 22 CDR That's what I was thinking. Why don't we gin that up - -

03 19 45 23 LMP Okay. Here we go.

03 19 45 24 CDR This one's - -

03 19 45 25 LMP CROSS-POINTERS both to HIGH MULT.

03 19 45 26 CDR - - 45. Let's - let's see what we have to do there.

03 19 45 31 LMP Okay, there - We've done that before in the middle of the CAL.

03 19 45 35 CDR Yes. No, I - I was just wondering if they want it over the ground. I think this - Let's just press on with it, and to hell with the ground. CROSS-POINTERS both to HIGH MULT.

03 19 45 44 LMP Okay, HIGH MULT.

03 19 45 46 CDR RATE/ERR MONITOR, LANDING RADAR COMPUTER.

03 19 45 48 LMP LANDING RADAR COMPUTER.

03 19 45 49 CDR TEMPERATURE MONITOR, LANDING RADAR greater than 49.

03 19 45 55 LMP Dave?

03 19 45 59 CDR RANGE ALTITUDE MONITOR to ALTITUDE/ALTITUDE RATE.

03 19 46 01 LMP LANDING ANTENNA to DESCENT.

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03 19 46 02 CDR LANDING ANTENNA to DESCENT.

03 19 46 03 IMP MODE SELECT to LANDING RADAR.

03 19 46 06 CDR MODE SELECT to LANDING RADAR.

03 19 46 08 LMP CB(11), PGNS, LANDING RADAR, CLOSE.

03 19 46 12 CDR CLOSE.

03 19 46 14 LMP Okay. CROSS POINTERS will oscillate, then up and right off scale. Man, I guess we got to wait for that to happen. I think I got to go to LANDING, the RADAR TEST to LANDING. Okay, there they go.

03 19 46 34 CDR Okay RADAR TEST to LANDING.

03 19 46 37 LMP Right. Okay, and you can read me the things here.

03 19 46 43 CDR Altitude transmitter is 3.7, velocity transmitter is 3.75. Okay, the altitude is - is 8290. Altitude rate is 450 and a half.

03 19 47 02 LMP LANDING ANHOVER - LANDING ANTENNA to HOVER.

03 19 47 08 CDR Okay, LANDING ANTENNA to HOVER.

03 19 47 11 LMP 10 seconds.

03 19 47 12 CDR 8000 feet. ... 50.5.

03 19 47 21 LMP Okay, the 10 seconds is up. LANDING ANTENNA to DESCENT.

03 19 47 25 CDR DESCENT.

03 19 47 26 LMP Okay. Wait 10 more seconds.

03 19 47 37 LMP Okay?

03 19 47 38 CDR Okay, 8290 and 450.5.

03 19 47 44 LMP Yes, I don't need that here. Hold on.

03 19 47 46 CDR Okay. Oh, yes, you don't.

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03 19 47 52 LMP Come on, baby, now.

03 19 47 54 CDR 8292 ...

03 19 47 59 LMP Go get her.

03 19 48 01 CDR Hmm? Minus 247, plus 930, plus 667.

03 19 48 09 LMP VERB 34, ENTER. LANDING ANTENNA to AUTO.

03 19 48 14 CDR LANDING ANTENNA to AUTO.

03 19 48 17 LMP VERB 61, coming in.

03 19 48 36 CDR 8000 and 450.5.

03 19 48 40 LMP Okay. VERB 62, ENTER; VERB 22, ENTER; ENTER, PRO.

03 19 48 50 CDR 82, 81, and 2.

03 19 48 56 LMP Okay, and up on top it's - -

03 19 48 59 CDR - - 8000 and 450.5.

03 19 49 03 CDR Okay, VERB 34, ENTER. RADAR TEST, OFF.  
LANDING RADAR PGNS circuit breaker, OPEN. MASTER  
ALARM and OFF.

03 19 49 16 LMP Okay, let's see if our time's up; it should be up  
right now.

03 19 49 21 LMP Up. Okay? This where we go? The AGS CAL is  
complete there, Chief.

03 19 49 36 CMP ...

03 19 49 39 LMP Say again.

03 19 49 40 CMP I say, you're on the air all the time.

03 19 49 42 LMP Yes, I noticed that now. Thank you. I think I'll  
use my VOX, and I forget to switch once in awhile.  
So if it sounds like we're chatting here, let us  
know during the rendezvous.

03 19 49 52 CMP Alright.

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03 19 51 40 LMP Okay, and I've got a question for you.

03 19 51 42 CC Go ahead.

03 19 51 44 LMP Roger, we noticed in updating the AGS that the computer activity light was on for a very long while. I wonder if maybe you updated our state vector more than a REV ahead, and then by doing a VERB 47 we intergrated it backward too far. I wonder if you can have someone look at that? Did you get that one?

03 19 52 09 CC We copy Spider. Stand by.

03 19 52 12 LMP It's just a question of whether VERB 47 hurts us - when we do that.

03 19 52 18 CC Roger. We can verify our state vector was not - was not more than a REV ahead, and we'll - we copied your question on the VERB 47.

03 19 52 27 LMP Okay, as long as it was not more than a REV ahead when you updated us - there should be no sweat.

03 19 52 34 CC Roger. Copy.

03 19 52 37 LMP Okay, did they want - -

03 19 52 38 CMP ...

03 19 52 38 LMP - - did they want to do a radar test?

03 19 52 47 CC Roger, Gumdrop. We've been tracking that, and it is running a little high. We think it's going to hold okay through the rendezvous.

03 19 52 56 CMP ...

03 19 53 01 CC Roger. It's been cycling with the night/day cycle. We think it ... to the radiator.

03 19 53 08 CMP Okay.

03.19 53 10 CDR And Houston, this is Spider. Do you want either the landing radar or the rendezvous radar self-test performed again over a site?

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03 19 53 18 CC That's a negative, Spider.

03 19 53 20 LMP Okay, great.

03 19 53 21 CDR Gumdrops, you're clear to turn your transponder on, then.

03 19 53 24 CMP Roger. And I also ... We'll be going together this time.

03 19 53 28 CDR Okay, fine. Okay, let's get our B transmitter on - our B receiver on, too.

03 19 53 34 LMP Right.

03 19 53 36 CDR We'll configure the same way. We'll be - RECEIVE A and B, TRANSMIT A.

03 19 53 40 CMP ...

03 19 53 42 CDR Okay.

03 19 53 45 LMP Okay, Gumdrops, you ready to support a lighting check?

03 19 53 48 CMP Ready to support.

03 19 53 50 LMP Okay, we're going to turn our tracking light on now and see if you can see it.

03 19 54 01 LMP I don't see anything flashing, do you? ... you look down at the porch, Jim?

03 19 54 10 CDR Would you believe it's not flashing?

03 19 54 14 LMP Either that, or we can't tell, huh?

03 19 54 15 CDR I don't think it's flashing, Rusty.

03 19 54 18 LMP I can feel it going, can you feel it?

03 19 54 19 CMP ...

03 19 54 21 CDR I don't see it either, Dave. Just a minute. What circuit breaker is that on?

03 19 54 34 LMP Uh -

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03 19 54 36 CDR Lighting? Let's see, the docking ...

03 19 54 38 LMP Track, over here. It's closed.

03 19 54 40 CDR Houston, are you with us yet? Hello, Houston, Spider. Do you read?

03 19 54 49 CC Houston here. Go ahead.

03 19 54 51 CDR Hold everything, I think I see it. Okay, it didn't look like our tracking light was on. I think I might see it now, though. Yes, I - Dave, I think I see it flashing.

03 19 55 01 CC Roger. Copy. And we'd like to have your S-band volumes up at about 57. We'll be in Honeysuckle in a couple of minutes.

03 19 55 09 CDR Okay. Dave, I can see a reflection - a regular reflection on one of the quad's out here; so I think it is flashing.

03 19 55 16 CMP ...

03 19 55 18 LMP Yes, I can too, Jim.

03 19 55 20 CDR Boy, it's sure not very bright, is it?

03 19 55 21 LMP It sure isn't.

03 19 55 22 CMP No, it doesn't seem to be.

03 19 55 23 LMP Its very directional, I'm sure. Okay, here come the docking lights. Okay, going into docking lights.

03 19 55 38 CMP Okay. I've got one of them on the right.

03 19 55 42 LMP Okay, that's good enough. We'll leave the docking lights on for you.

03 19 55 48 CDR Okay, why don't you give me your lights.

03 19 55 51 CMP All right, here comes my docking lights.

03 19 56 01 LMP I don't see anything.

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03 19 56 03 CMP ...

03 19 56 08 CDR Answer what they call.

03 19 56 10 LMP Yes, I will. I don't see anything up there, Dave.

03 19 56 14 CMP Okay.

03 19 56 17 LMP It's - it's on the other side of the spacecraft, Jim.

03 19 56 18 CDR Okay.

03 19 56 23 CMP I don't see anything here, either.

03 19 56 25 LMP No, neither do I. Your spotlight doesn't work at all?

03 19 56 30 CMP ...

03 19 56 39 LMP Great.

03 19 56 42 CMP ...

03 19 56 45 CDR What's that?

03 19 56 47 CMP The RL antenna ...

03 19 56 50 CDR Yes.

03 19 56 53 CMP ...

03 19 57 04 CDR Okay, I see the EVA light. That's all I see.

03 19 57 08 CMP Okay ...

03 19 57 10 CDR Yes, that's okay. I'll probably be just about right for EVA.

03 19 57 16 CMP Okay. ...

03 19 57 19 CDR What's that?

03 19 57 21 CMP ... 10 ...

03 19 57 25 CDR Okay.

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03 19 57 28 LMP I think we're getting interference from that other transmitter of his.

03 19 57 34 CDR Okay, don't forget to put the docking target up.

03 19 57 36 CMP ...

03 19 57 38 CDR Okay, very good.

03 19 57 53 LMP Okay, PREP for undocking.

03 19 57 57 CDR Let me ... - -

03 19 57 58 LMP Configure the cameras. You got everything checked off there?

03 19 58 06 CDR Well, let me look and see.

03 19 58 21 CMP Okay, you want to take a look at the docking target?

03 19 58 24 CDR Okay, go ahead. Ooh, is that ever bright!

03 19 58 29 CMP That's ... least ...

03 19 58 33 LMP What did you say?

03 19 58 35 CMP That's dim.

03 19 58 36 LMP Okay, give me bright.

03 19 58 39 CDR There's not much difference between them. Boy, that thing is really off, Dave. When we come back and try to dock, you're going to have to really keep an eye on me. As a matter of fact, the thing has shifted a little bit from when I looked at it - yesterday, I think. Not too much.

03 19 58 53 CMP ...

03 19 58 57 LMP No, it's pretty stationary there. It's just that the COAS isn't pointing in the right direction. If it looks like I'm getting dangerous, we - I'll just ATTITUDE HOLD and you can do it.

03 19 59 05 CMP Okay.

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03 19 59 11 CC ... I have your phasing pad when you ready to copy.

03 19 59 17 LMP Roger, Houston. Stand by. I'll get out the phasing pad.

03 19 59 23 CC Standing by.

03 19 59 32 CDR Hey, Dave, did your spotlight ever work at all?

03 19 59 35 CMP No, Lord, no.

03 19 59 38 LMP Hey, ... Dave, that we're ready to - -

03 19 59 41 CDR Hey, Dave, I think we're going to - -

03 19 59 42 LMP - - do a phasing pad.

03 19 59 43 CDR - - send up the phasing pad. You ready to copy?

03 19 59 44 CMP ...

03 19 59 46 LMP S-band. S-band. You're on S-band.

03 19 59 55 CC Gumdrop, Houston. How do you read?

03 19 59 58 CMP Okay, now that I have the volume up, I read you pretty good.

03 20 00 01 LMP ... ready.

03 20 00 03 CMP Gumdrop ready.

03 20 00 05 CC Roger, Spider/Gumdrop. Reading phasing pad.  
093:47:3400, plus 00009, all zips, minus 00907,  
00907, 000, 286, plus 00020, all zips, minus 00907.  
Your SEP time: 093:02:5300; TPI: 009, 45, 75300.  
End of update.

03 20 01 31 LMP Roger. On the readback, we've got a - 093:47:3400,  
plus 00009, all zips, minus 00907, 00907, all  
zips, 286, plus 00020, all zips, minus 00907;  
SEP at 93:02:53; TPI: 09, 45, 753.

03 20 02 07 CC Okay, Rusty. Read me your SEP time again. ...

03 02 02 13 LMP Roger. SEP at 93:02:53.

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03 20 02 21 CMP And Gumdrops copies.

03 20 02 23 LMP Hey, did you agree with the SEP time, Dave?

03 20 02 25 CMP ... yes.

03 20 02 28 LMP Okay. Are you transmitting B?

03 20 02 33 CMP Negative.

03 20 02 34 LMP Okay, we've had a change in our COMM since we reconfigured here, and I'm just trying to figure out why.

03 20 02 39 CMP Okay, I'm ...

03 20 02 44 CDR We - we don't have - the VHF B transmitter to DATA do we?

03 20 02 52 LMP No. Okay, you want - You don't want that up there now, do you?

03 20 03 04 CDR This thing?

03 20 03 05 LMP Yes.

03 20 03 06 CDR No ... have it up there.

03 20 03 21 LMP You want to stay in 83, here?

03 20 03 23 CDR For a little while, yes.

03 20 03 24 LMP Okay.

03 20 03 32 CDR Okay, since we don't need this anymore, I'll just deposit it down here.

03 20 03 39 LMP Okay, PREP for undocking. Ready?

03 20 03 42 CDR PREP for undocking. Roger.

03 20 03 43 CC ... Tananarive ...

03 20 03 52 CMP Gumdrops. ...

03 20 03 54 LMP This is Spider. Roger.

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03 20 03 56 CC ...

03 20 04 05 LMP Okay, - configure the cameras. I got those, and would you believe we got the right magazines on both cameras?

03 20 04 10 CDR I can't, I can't, I can't!

03 20 04 11 LMP That's hard to believe - Go ahead, Houston, Spider.

03 20 04 19 LMP Okay, hold up. Okay, CSM configure for DUPLEX A and RECEIVE A only, and I think he is. LM configure for basic COMM with VHF B backup. Got that. Audio VHF B to RECEIVE, VHF B TRANSMITTER to VOICE, VHF B RECEIVER this - there's no sense in putting the transmitter on.

03 20 04 38 CDR No, we're not supposed to have that on.

03 20 04 43 LMP Mount the phasing pad. Set the DET for the RCS SEP time. Okay, SEP time is 93:02:53. 93:02! My aching back! Okay, that's right.

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03 20 05 01 CDR And use 25 minutes before that.

03 20 05 03 LMP 93:02:53, so it's going to be 57 minutes.

03 20 05 47 LMP Have you figured out how you want to configure yourself to look through the AOT, Jim, as far as restraints are concerned?

03 20 05 52 CDR I think I'll just take them off, Rusty.

03 20 05 59 LMP Okay. And Gumdrop, whenever you get your clock set you can give me a hack for the time to SEP.

03 20 06 12 CMP Will do.

03 20 06 39 LMP Okay, OVERHEAD HATCH, LOCKED. OVERHEAD DUMP valve in AUTO. PRESSURE REGS A and B in CABIN; LIGHTING EXTERIOR to DOCK; ATTITUDE CONTROL, three, to PULSE.

03 20 06 56 CDR Three, PULSE.

03 20 06 57 LMP GUIDANCE CONTROL to AGS.

03 20 06 59 CDR GUIDANCE CONTROL, AGS.

03 20 07 01 LMP MODE SELECT to LANDING RADAR. And we're in the wrong configuration on a lot of these things because we did the rendezvous radar test earlier.

03 20 07 07 CDR Right, right.

03 20 07 08 LMP Okay, RANGE ALTITUDE MONITOR to RANGE, RANGE RATE.

03 20 07 11 CDR RANGE, RANGE RATE.

03 20 07 12 LMP ERROR MONITOR to LANDING RADAR COMPUTER.

03 20 07 14 CDR Right.

03 20 07 15 LMP Let's see how they compare now. And ATTITUDE MONITOR to AGS; they look good.

03 20 07 20 CDR Yes. Shaft and trunnion are plus or minus 5.

03 20 07 23 CDR 5.

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03 20 07 24 LMP CROSS POINTER to HIGH MULT.  
03 20 07 26 CDR There, HIGH MULT.  
03 20 07 27 LMP ENGINE ARM to OFF.  
03 20 07 30 CDR OFF.  
03 20 07 31 LMP X-TRANSLATION to 2 JETS.  
03 20 07 32 CDR 2 JETS.  
03 20 07 34 LMP Okay, BALANCE COUPLE's ON.  
03 20 07 36 CDR ON.  
03 20 07 37 LMP DEADBAND, MIN.  
03 20 07 38 CDR MIN.  
03 20 07 39 LMP MODE CONTROL to ATT HOLD.  
03 20 07 41 CDR ATT HOLD.  
03 20 07 43 LMP TTCA, both, to JETS - DOWN, that is.  
03 20 07 49 CDR JETS, DOWN.  
03 20 07 50 LMP Okay, RENDEZVOUS RADAR to LGC.  
03 20 07 54 CDR It's there. LGC.  
03 20 07 56 LMP And verify the undocking attitude. Okay, now that's going to be a little bit different this time. It's going to be different by -  
03 20 08 04 CDR How many - how much are we off in minutes?  
03 20 08 06 LMP We're off in minutes by - on phasing we're off by 3 minutes exactly, so it's 12 degrees. So instead of being 16, and that will be something different.  
03 20 08 26 CDR Say, we're out by 4, 9351 against 9347.  
03 20 08 29 LMP 47. Yes; 4 minutes, 16 degrees. Okay. CB(11)  
R&D INSTRUMENTATION A, CLOSE.

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03 20 08 40 CDR CB(11) R&D INSTRUMENTATION A, CLOSE. Okay?

03 20 08 43 LMP Okay, by damn, there it is. Put my checklist away here. Boy, you just can't - I can't even get into that pocket. (Laughter)

03 20 09 17 CDR What are we set up there for; the phasing or the separation burn?

03 20 09 20 LMP Separation's - Okay. I think I'll put my gloves on for undocking. Okay, Gumdrops; this is Spider here. We're all set up ready to undock. Hey, you done with the 83?

03 20 09 57 CDR Let me check it one more time. No, I'm not going to be doing that.

03 20 10 05 CDR Roger, Houston; this is Spider.

03 20 10 12 LMP Houston, Spider. How do you read?

03 20 10 15 CC I read you loud and clear, Spider. This is Houston. You are GO for undocking; you are GO for 78-1. Your AGS is GO. You can just unscrew the bulb if that light bothers you, and would like to inform you that during the phasing burn and probably also during the braking, you can anticipate a heater CAUTION light coming on. This - this will be from the RCS, and this is after looking at the data that we've got here. There'll be no sweat.

03 20 10 48 LMP Okay. Thank you. Okay, let me read SEP 1: Prepare phasing pad. We got that. Set cameras. Verify CB(11), STAB/CONTROL AELD, OPEN.

03 20 11 16 CDR AELD, OPEN.

03 20 11 17 LMP DECA POWER, OPEN.

03 20 11 19 CDR DECA POWER, OPEN.

03 20 11 20 LMP Earth orbit R&D INSTRUMENTATION A, CLOSED.

03 20 11 23 CDR R&D INSTRUMENTATION A, CLOSED.

03 20 11 25 LMP DFI POWER, OFF.

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03 20 11 27 CDR DFI POWER, OFF.  
03 20 11 28 LMP R&D B, CLOSED.  
03 20 11 29 CDR R&D B, CLOSED.  
03 20 11 30 LMP CB(16) STAB and CONTROL AELD, OPEN in DESCENT  
ENGINE OVERRIDE.  
03 20 11 35 LMP AELD, OPEN.  
03 20 11 37 CDR Go ahead, Gumdrop. Spider.  
03 20 11 38 CMP I'll give you a MARK at 51:10. Okay.  
03 20 11 41 LMP Okay.  
03 20 11 42 CMP Ready.  
03 20 11 43 CMP MARK.  
03 20 11 45 LMP 1 second off.  
03 20 11 46 CDR Okay, we're off by about a second.  
03 20 11 54 CDR Hey, you sure sound funny all of a sudden; say  
something again.  
03 20 11 57 CMP Okay. Something again. I just switched to the  
other side.  
03 20 12 01 LMP Oh, man alive, you're sort of garbled.  
03 20 12 11 LMP Good.  
03 20 12 18 LMP Yes, that clock is 1 second fast, Jim, here. We  
could go to STOP then START again - on it.  
03 20 12 24 CMP Houston, Gumdrop.  
03 20 12 34 CMP Spider, Gumdrop. You been able to contact Houston?  
03 20 12 37 LMP Houston, this is Spider. Do you read?  
03 20 12 41 CC Spider, this is Houston. I'm reading you loud and  
clear.

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03 20 12 44 LMP Roger. Gumdrops is trying to call you.

03 20 12 48 CMP Houston, Gumdrops.

03 20 12 49 CC Gumdrops, Houston. How do you read?

03 20 12 50 CMP Loud and clear; and me?

03 20 12 53 CC Roger. You're breaking up slightly and way down, Gumdrops.

03 20 12 59 CMP Roger. That fuel cell 2 and - and I got - -

03 20 13 00 LMP Say, that can sure change radios fast.

03 20 13 04 CMP - - and I've got a fuel cell 2 light. Just thought I'd let you know.

03 20 13 11 CC Roger. Understand. Fuel cell 2 light, and that's from the TCE?

03 20 13 16 CMP That's affirmative - -

03 20 13 18 LMP Oh, no.

03 20 13 19 CC - - and you're loud and clear now, Gumdrops -

03 20 13 21 CMP Okay.

03 20 13 24 LMP You're still a little garbled to me, Gumdrops. Whatever you did in the last few minutes you sure changed the character of your radio.

03 20 13 30 CMP Let me go back the other way.

03 20 13 33 LMP Gumdrops, it wasn't that, it was when you switched to the rendezvous configuration, I believe.

03 20 13 39 CMP Roger. Let me try it the other way.

03 20 13 45 CMP How do you read now? What?

03 20 13 47 LMP Just that -

03 20 13 48 CDR It's about the same.

03 20 13 52 CDR Wonder what changed?

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03 20 13 55 CDR Maybe he changed something on his COMM configuration.  
03 20 13 59 CDR I didn't hear what he said.  
03 20 14 00 LMP Well, that was from one panel to another. You want to get that - you want to set the mission timer; right, Jim?  
03 20 14 11 CDR Yes, let's see what it is. Let's ... - get up -  
... - -  
03 20 14 17 LMP Oops - VERB 16, NOUN 65, ENTER. I think you can go to STOP and START VERB; just 1 second.  
03 20 14 31 CDR Seems about a half a second off.  
03 20 14 34 LMP Well, why don't you just flip it there.  
03 20 14 36 CDR Let me see what we can do here.  
03 20 14 43 CDR Rats, now it's a half a second off the other way.  
03 20 14 46 CC Houston, Gumdrop. Go.  
03 20 14 47 CC Okay, that TCE's hanging right on the ragged edge, Dave, on that caution and warning trip. And we'll be keeping an eye on it for you, but it might trip off here a couple of times during the rendezvous.  
03 20 15 02 CMP Okay. Very well. Thank you.  
03 20 15 04 CC Roger.  
03 20 15 08 CDR Okay, we'll be fast.  
03 20 15 10 LMP No, no fooling around.  
03 20 15 14 CC - see you over sunny Grand Bahamas in about 36.  
03 20 15 19 CDR This is Spider. Roger.  
03 20 15 20 CMP Gumdrop.  
03 20 15 28 LMP Okay; let's continue on down here then.  
03 20 15 30 CDR Yes.

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Tape 09-03601

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03 20 15 31	LMP	I got my breakers OPEN. Verify COMM configuration. GUIDANCE CONTROL to AGS.
03 20 15 37	CDR	AGS.
03 20 15 38	LMP	DEADBAND, MIN.
03 20 15 39	CDR	MIN.
03 20 15 40	LMP	ATT CONTROL, three, to PULSE.
03 20 15 41	CDR	PULSE.
03 20 15 42	LMP	MODE CONTROL ATTITUDE, HOLD.
03 20 15 43	CDR	ATT HOLD.
03 20 15 45	LMP	VERB 37, ENTER 00 - I know we got that, VERB 76, ENTER.
03 20 15 50	CDR	ENTER.
03 20 15 51	LMP	VERB 63, ENTER.
03 20 15 53	CDR	VERB 63, ENTER.
03 20 15 56	LMP	EXTERIOR LIGHTING to DOCK - I got that. COAS POWER to FORWARD, and COAS BRIGHTNESS, ADJUSTED.
03 20 16 02	CDR	Okay, I've done that.
03 20 16 04	LMP	VERIFY the DAP at 01002.
03 20 16 12	CDR	01002. Okay, we look pretty good.
03 20 16 19	LMP	Okay.
03 20 16 20	CMP	Spider, Gumdrop. I'm going to start maneuvering ... for the undocking attitude.
03 20 16 24	LMP	Okay, fine. We're all all ready to go here.
03 20 16 28	CMP	Okay. Very good.
03 20 16 46	LMP	You know something?
03 20 16 47	CDR	What?

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Tape 09-03601

03 20 16 48 LMP My FLOW CONTROL valves have been in VERTICAL since yesterday.

03 20 16 53 CDR (Laughter)

03 20 16 56 LMP No wonder my fingers are warm.

03 20 17 04 LMP It also helps a little with the COMM.

03 20 17 08 CDR I had my volumes all the way up already.

03 20 17 13 LMP Really?

03 20 17 14 CDR Yes.

03 20 17 15 LMP Okay.

03 20 17 16 CDR VHF A, B, and MASTER are all full UP.

03 20 17 17 LMP Okay, I'm pretty far down on all of them.

03 20 17 25 CDR How are the reflections in the window?

03 20 17 27 LMP Terrible.

03 20 17 28 CDR Are they?

03 20 17 29 LMP I'll get into right configuration here and see how they are.

03 20 17 33 LMP Yes, I've got my side panels OFF now.

03 20 17 39 CDR I cleared my ears; that might help.

03 20 17 42 LMP Ha, - the reflections?

03 20 17 44 CDR Yes, that makes the reflection a lot less. They're not too bad. I can see you, all of you.

03 20 17 51 LMP Here, let's turn this around so it doesn't shine on you. Yes, there you go.

03 20 17 57 CDR That helps a little.

03 20 18 03 LMP Man, this is going to be a long hungry day; I can feel it already.

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Tape 09-03601

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03 20 18 23 LMP 9 hours to go almost.

03 20 18 24 LMP Huh.

03 20 18 33 CDR I know what I want to do. I want to look through here.

03 20 18 39 LMP I don't see much out there.

03 20 18 43 CDR Would you believe our radar is back up in view again?

03 20 18 46 LMP Yes, well, it's supposed to be. It's not all the way up, is it? It's on the bottom of the field?

03 20 18 51 CDR Yes, it's in the bottom of the field.

03 20 18 53 LMP Okay. That's where we put it 323, not the 283 -

03 20 18 54 CDR Uh huh.

03 20 18 58 LMP And with his light shining in, it shines right in to the - right into there, so I can't see anything.

03 20 19 07 CDR Let's hope that 283 is better.

03 20 19 11 LMP What's that?

03 20 19 12 CDR Okay, let's hope that the 283 is better.

03 20 19 14 CMP Yes; well, with his light shining in the telescope I couldn't see anything anyway.

03 20 19 20 LMP Oh, he's got his lights on, huh?

03 20 19 21 CDR Yes.

03 20 19 28 LMP Can I help you back there?

03 20 19 29 CDR No, I just want to get the eye patch out.

03 20 19 49 LMP What's he got his docking target on?

03 20 19 52 CDR There's a - EVA light ON.

03 20 19 56 CDR (Yawn)

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Tape 09-03601

03 20 19 57 LMP That's on the EVA RUNNING LIGHT SWITCH.

03 20 19 58 CDR Hell, he didn't - oh. - Uh huh.

03 20 20 20 CDR Boy, that stuff up there is really all reflected in the window.

03 20 20 24 LMP It is?

03 20 20 26 CDR Yes.

03 20 20 27 LMP How's that?

03 20 20 29 CDR Looks better.

03 20 20 30 LMP Okay, how's that?

03 20 20 33 CDR Looks better. I can see all of it. Wait a minute.

03 20 20 39 LMP Yes, we got everything up pretty bright.

03 20 20 42 LMP You know that doggone AGS light doesn't help any either.

03 20 20 45 CDR (Laughter) Yes.

03 20 20 54 CDR Punch something up on your DEDA. Let's say -

03 20 20 58 LMP Okay?

03 20 20 59 CDR How light. How bright the lights are. I'm going to power up the -

03 20 21 12 LMP Yes, the balance is pretty good.

03 20 21 13 CDR Yes.

03 20 21 15 LMP The trouble is we're going to undock in the daytime, so we're going to need it up bright.

03 20 21 17 CDR Yes. I just wanted to see what it looks at night.

03 20 21 19 LMP Yes. You can turn your side panels off, too. That will help.

03 20 21 22 CDR Yes.

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03 20 21 23 LMP Matter of fact, the DSKY goes off before the DEDA does.

03 20 21 27 CDR Yes. That - that's a switch.

03 20 21 48 LMP Gumdrop, we've got 41 minutes to the SEP BURN.

03 20 21 53 LMP MARK.

03 20 21 54 CMP Right with you.

03 20 21 56 LMP ... ful.

03 20 22 03 CDR What kind of stars have we got out there? There's the Big Dipper right in front of us. ... right in front of us. And there is -

03 20 22 10 CMP ... and about 15 more degrees to go.

03 20 22 16 LMP Okay.

03 20 22 17 CDR There's Leo.

03 20 22 22 CDR There's Corvus.

03 20 22 33 LMP There's really a bright planet out there. What the heck planet is over by Leo?

03 20 22 44 CDR The moon looks like it's around over in Spica -

03 20 22 47 LMP Leo, near Leo has got to be our friend; isn't it Venus? Really bright.

03 20 22 53 CDR Yes, very bright.

03 20 22 56 LMP I can't quite see it. Oh, yes, it's down there. Let me see if I can see him out here. No, I can't because of the camera. Yes, that's Venus. He's minus 4.3 magnitude; would you believe that? Okay, our attitude is - it's not 180 yet, but it's getting there. 300, and we're at about 14. Let me see the PGNS.

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Tape 09-03601

03 20 23 46 LMP He must be in WIDE DEADBAND.

03 20 23 49 CDR Yes, I'm sure he is.

03 20 23 56 LMP I sure wish we had those letters on there.

03 20 23 59 CDR Yes.

03 20 24 02 LMP Damn it; oh, is that in the Systems Book?

03 20 24 06 CDR Yes, it is.

03 20 24 10 LMP You want to try to do that now?

03 20 24 12 CDR Yes.

03 20 24 13 LMP Okay.

03 20 24 19 CDR Can you get the Systems Book?

03 20 24 21 LMP Yes.

03 20 24 23 CDR Here, I think I can probably get it easier than you.

03 20 24 24 LMP Oh shoot, I can't quite reach it. Okay, it's - it's the top one. That's it. Okay, I got it.

03 20 24 58 LMP Okay, if you want to read them to me out of - on that diagram, hold on; I want to take off my gloves, and I'll write them up there.

03 20 25 07 CDR Say again, Dave.

03 20 25 09 CMP ... activity up.

03 20 25 10 LMP Okay.

03 20 25 17 LMP We're on the NOMINAL along there.

03 20 25 21 LMP Yes, we should be, as far as attitude and stuff goes. Okay?

03 20 25 24 LMP No, we're 4 minutes early.

03 20 25 25 CDR Oh, it doesn't make any difference. They REFSMAT us to a different place then. Okay, SYSTEMS A QUAD 1 is UP and FORWARD.

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Tape 09-03601

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03 20 25 34	LMP	Quad, let me see where I want to put it now. QUAD 1, okay, 1 is ...and FORWARD. There. Okay.
03 20 25 45	CDR	QUAD 2, SYSTEM A is AFT and DOWN.
03 20 25 50	LMP	AFT and DOWN.
03 20 25 55	CDR	QUAD 3 is UP and RIGHT.
03 20 25 59	LMP	QUAD 3 is UP and RIGHT.
03 20 26 07	CDR	QUAD 4 is DOWN and RIGHT.
03 20 26 13	LMP	DOWN and RIGHT.
03 20 26 16	CDR	Okay, SYSTEMS B. SYSTEM B QUAD 1 is DOWN and LEFT.
03 20 26 22	LMP	DOWN and LEFT.
03 20 26 25	CDR	QUAD 2 is UP and LEFT.
03 20 26 27	LMP	UP and LEFT.
03 20 26 30	CDR	QUAD 3 is DOWN and AFT.
03 20 26 34	LMP	DOWN and AFT.
03 20 26 37	CDR	And QUAD 4 is UP - UP and FORWARD.
03 20 26 41	LMP	UP, FORWARD.
03 20 26 44	CDR	Just a minute, Dave.
03 20 26 49	CDR	Check the attitude against what we've got there in the book.
03 20 26 51	LMP	Okay, roll?
03 20 27 02	LMP	Hey, it looks like you're off a couple degrees in your roll.
03 20 27 07	CMP	Okay, I'd believe that.
03 20 27 11	LMP	I guess you got to roll right a couple more?
03 20 27 14	CMP	Now roll left.

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Tape 09-03601

03 20 27 35 LMP Roll left?

03 20 27 36 CDR 055. I'm not sure that our ORDEAL is working worth a hoot.

03 20 27 40 LMP Not on ours; it didn't roll left.

03 20 27 43 CDR Don't argue with him about which way we're going to roll here.

03 20 27 47 LMP Okay, but we have an attitude problem then.

03 20 27 57 CMP That should be right lined up there.

03 20 28 01 LMP Okay, you agree with me?

03 20 28 08 LMP What is your roll angle?

03 20 28 10 CMP 180.

03 20 28 13 LMP Okay, I know what our problem is. It's the docking ring angle, and it's - so we should read 2 degrees more than normal. Okay, let's go.

03 20 28 21 CMP How about that.

03 20 28 23 LMP Whew, figured it out. 302.36. That's right; that's right.

03 20 28 40 LMP Okay, we agree then.

03 20 29 26 CDR Say, Regulus is one of the stars we use for our star check two, isn't it?

03 20 29 30 LMP It's the third star check on the second alignment.

03 20 29 36 CDR Right over there by the moon.

03 20 29 44 LMP Doggone it, the tape is on. I wonder when I turn that on?

03 20 37 48 CDR 5 seconds, UNDOCK.

03 20 37 49 CDR MARK.

03 20 37 50 CMP 3, 2, 1, UNDOCK.

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03 20 37 53	CMP	UNDOCK.
03 20 37 58	LMP	Uh - oh. We didn't release.
03 20 37 59	CMP	No, it's hung.
03 20 38 08	CMP	I'll reinsert and pull backwards.
03 20 38 10	LMP	Say again.
03 20 38 11	CMP	I said we are hanging on something - I'm going to pull you back a little bit.
03 20 38 14	CDR	Okay.
03 20 38 23	CDR	Okay. Okay, we're nice and stable with respect to you.
03 20 38 41	CDR	Okay, we - we're hanging on to the end of the probe, Rusty, and Dave is maneuvering around, and he's getting straight, and we're going to redock.
03 20 39 00	CMP	Okay. You seem to be hanging; it seems like the probe is out; the capture latches just haven't released.
03 20 39 05	LMP	Yes, that's what it looks like.
03 20 39 07	CDR	We're pretty stable here. Wonder what's wrong with it?
03 20 39 15	CMP	Houston, got any suggestions?
03 20 39 17	LMP	No - You know -
03 20 39 18	CC	We're copying all that, Gumdrops and Spider. Stand by.
03 20 39 21	LMP	Jim, we probably ought to thrust up when we - oh, no - that's right -
03 20 39 24	CDR	No, we're captured.
03 20 39 25	LMP	We're captured.
03 20 39 26	CDR	... We're all right.

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Tape 09-03601

03 20 39 27 LMP Well, if - if all of them are still hanging.

03 20 39 30 CDR No, we're alright.

03 20 39 32 LMP ... we're - we're solid. You could really feel that yank on it, so -

03 20 39 35 CMP You're free.

03 20 39 37 LMP I'm free?

03 20 39 38 CMP Roger.

03 20 39 39 LMP What did you do?

03 20 39 40 CMP Oh, went to the old memory and put a cycle on the switch, and you look like you're free.

03 20 39 45 CDR Okay, great.

03 20 39 47 LMP Did you deploy?

03 20 39 48 CDR Okay, go to MODE CONTROL.

03 20 39 51 CDR Okay, we're going to start our yaw around.

03 20 39 53 LMP Okay.

03 20 39 54 CMP Hold off.

03 20 39 56 CDR What?

03 20 39 57 CMP Hold on it.

03 20 39 58 CDR I can't hear you -

03 20 39 59 LMP HOLD!

03 20 40 00 CMP Wait a minute until I get clearance.

03 20 40 02 CDR Okay.

03 20 40 05 CMP Now you're clear.

03 20 40 06 CDR Okay, easy. Hey, you got about 3 degrees per second on that.

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03 20 40 12 LMP	Ooops. Okay.
03 20 40 13 LMP	Okay, go again.
03 20 40 14 CDR	Now.
03 20 40 16 LMP	Keep it over there, Jim.
03 20 40 17 CDR	Okay, got it.
03 20 40 21 LMP	Well, I guess we'll see at the end of the rendezvous whether all that's going to work.
03 20 40 27 CDR	Yes. Okay, our attitudes are a little screwed up now, Dave, so we may have a little problem with that.
03 20 40 34 CMP	Roger. I noticed.

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Tape 09-03601

03 20 40 37 CMP Okay, I'm still stationkeeping on you now, so no sweat.

03 20 40 40 CDR Okay.

03 20 41 09 CMP Spider, I'm going to stay in plane and just follow you with the pitch.

03 20 41 13 LMP Okay, fine. How am I drifting away from you?

03 20 41 16 CMP You're drifting out of plane.

03 20 41 18 LMP Okay.

03 20 41 20 CMP To your rear.

03 20 41 21 LMP Okay, well I can't notice that.

03 20 41 24 LMP My REGS look good - my yaw rate is going around about 1 degree per second.

03 20 41 34 CDR Yes, the flight control system is reasonably stable -

03 20 41 36 LMP After we get over to the bellyband we could roll  
...

03 20 41 39 CMP ...

03 20 41 40 CDR Yes.

03 20 41 42 LMP Up - upright first?

03 20 41 43 CDR Yes, I think so.

03 20 41 44 LMP Okay.

03 20 41 45 CMP You yawing now?

03 20 41 46 CDR That's right; I'm yawing right now.

03 20 41 48 CDR I'm doing my 120 degree yaw. When I get over here, Dave, why don't I just stop the yaw and roll - my roll so that I'm up - rightside up on the bellyband. Then we can get back to maybe about the right attitude, at least in plane.

03 20 42 00 CMP Good idea.

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Tape 09-03601

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03 20 42 21 CDR Okay. Stand by - stand by.  
03 20 42 22 CMP ... 6 hours. 8  
03 20 42 24 CDR MARK.  
03 20 42 26 CDR Hit it. There.  
03 20 42 27 CDR Shoot, let me just maneuver it over there.  
03 20 42 33 LMP You want it in PULSE to MANEUVER.  
03 20 42 34 CDR Yes, put in PULSE.  
03 20 42 35 LMP You're in PULSE.  
03 20 42 36 CDR This hand controller is really bad news.  
03 20 42 44 LMP Roll PULSE?  
03 20 42 45 CDR No, let me take it over in yaw first.  
03 20 42 47 LMP Okay.  
03 20 42 50 CDR Okay, go to ATTITUDE HOLD.  
03 20 42 52 LMP Okay, you got MODE CONTROL?  
03 20 42 55 LMP Okay. You want roll PULSE?  
03 20 42 56 CDR Yes, give me roll PULSE.  
03 20 42 57 LMP ... You got it?  
03 20 43 00 CDR Okay, Dave, I'm going to roll up in plane now.  
03 20 43 02 LMP Boy, every time you do that, we get that - oh, I get it. We should get that though. Start getting fluctuations in the manifold - yes - but that's right.  
03 20 43 15 LMP Hey, let's pitch at a little higher rate, Jim, to catch up here.  
03 20 43 19 CDR Well, wait a second. Why don't you just - let's just forego some of the inspection, at least get each other squared away here.

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Tape 09-03601

03 20 43 26 LMP Okay, well, we can see how it works out.

03 20 43 27 CDR Yes.

03 20 43 28 CDR Okay, Dave, I'm going to come rightside up here now, and when I get there, then I'll just stop and you can position yourself.

03 20 43 35 CMP Okay.

03 20 43 59 CDR Okay.

03 20 44 02 CDR We're not going - we're not going to do the pitch, 180-degree pitch.

03 20 44 04 LMP We won't do that 180-degree pitch, Dave. We'll just do the 90-degree pitch up here.

03 20 44 09 CMP Okay, good idea.

03 20 44 14 CDR Get over there.

03 20 44 30 CDR Okay, go to ATTITUDE HOLD -

03 20 44 31 CMP I think it would be alright if we just get some relative attitudes, because I'm going to maneuver to the proper attitude for the SEP, and you can line up with me there.

03 20 44 36 LMP Right. Okay.

03 20 44 37 CDR Okay, ready for the pitch?

03 20 44 38 LMP I'm going to do the pitch around maneuver, and I'm going to pitch 90 degrees only.

03 20 44 42 CMP Okay, fine.

03 20 44 43 LMP Okay, I'm going to start now.

03 20 44 45 CDR Okay, I'm going to start. Ready.

03 20 44 49 LMP Okay there. Oh shoot, now. (Laughter) Just by accident - okay, you got - that's the other one's fine. Okay, camera coming out. All set. Boy, that sun is going to be right in the wrong place for - for these pictures, holy smoke.

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Tape 09-03601

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03 20 45 21 CMP It's looking good.

03 20 45 22 LMP Okay.

03 20 45 23 LMP Okay, Jim, I'll be ready to hit the hand controller.

03 20 45 26 CDR I can get it.

03 20 45 27 LMP No, that's okay. I'll get it. You got to hit that doggone hand controller so fast there.

03 20 45 31 CDR I think - let me try - I could - I could do better myself if I knew when - when it was going to get hit.

03 20 45 36 LMP Okay.

03 20 45 45 LMP How's he coming?

03 20 45 46 CDR I don't know; I don't see him yet.

03 20 45 48 CDR Here he comes.

03 20 46 00 CMP That's a nice looking machine.

03 20 46 03 LMP So is yours. Where is he?

03 20 46 04 CDR He is over here in the left.

03 20 46 05 LMP Oh, shoot - no wonder - oh, there he is.

03 20 46 09 CMP That's about all it looks like, though, is some sort of a machine.

03 20 46 11 LMP You sure you don't want me to get it, Jim?

03 20 46 12 CDR No, I'll get it.

03 20 46 13 LMP Okay.

03 20 46 15 CDR Okay, Dave, when I get about perpendicular to you here, I'm going to stop and start my yaw to the left.

03 20 46 21 CMP Okay.

03 20 46 29 CDR Okay, I'm going to start my yaw around to the left.

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Tape 09-03601

03 20 46 31 LMP Okay, - do you want to - okay.

03 20 46 34 CDR Okay, why don't you get some pictures.

03 20 46 35 LMP Okay.

03 20 46 40 LMP We're not that far behind, Jim. We're - we've got lots of time.

03 20 46 43 CDR We're supposed to start that in 18 minutes, so we're just about - just about there.

03 20 47 14 CMP I think we're in good shape altitude - attitude-wise.

03 20 47 18 CDR Yes, we only got off about 20 or 30 degrees there in pitch, Dave.

03 20 47 24 LMP Try another setting here real quick.

03 20 47 36 LMP His flashing beacon is working, by the way.

03 20 47 38 CDR Yes, I saw that.

03 20 47 40 LMP Okay.

03 20 48 06 CMP All the downlock squibs look good so far.

03 20 48 16 LMP Okay, let me get this off of here.

03 20 48 24 LMP Oh no, I want to keep it there, that's right.

03 20 48 25 LMP Woo! Forgot.

03 20 48 47 CDR On shoot, I think our COAS is crapped up.

03 20 48 50 LMP Yes, that's a pretty bright background.

03 20 48 51 CC Spider and Gumdrop, Houston. Sometime within the next 4 minutes let's get - be sure your S-band volume is up. We'll be going over to Madrid.

03 20 48 57 LMP Roger, Spider.

03 20 48 58 CMP Gumdrop.

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03 20 49 07 LMP Well, I think that - Okay, you can - you can - discuss the thing on the tape here; we got that on.

03 20 49 18 CDR Okay, the attitude control in - in AGS every bit as bad as it is in the simulator, I think.

03 20 49 24 LMP CB(11), STAB CONTROL DECA POWER, CLOSED, first, Jim.

03 20 49 27 CDR Okay. DECA POWER, CLOSE.

03 20 49 29 LMP Right. Okay, and I got DESCENT ENGINE OVERRIDE, CLOSE.

03 20 49 33 CDR Okay.

03 20 49 34 CMP Okay.

03 20 49 42 CDR Yes, I really think we've lost the God-blessed COAS.

03 20 49 51 CMP Okay, I've got 13 minutes before the SEP burn.

03 20 49 53 LMP Okay.

03 20 49 56 CDR Would you believe it, but I think my COAS went out.

03 20 49 59 CDR Oh no, there it is over there. Okay.

03 20 50 02 LMP You got it against the right stop, Jim?

03 20 50 04 CDR What?

03 20 50 06 LMP You have it against the right stop?

03 20 50 07 CDR Yes.

03 20 50 08 LMP Okay.

03 20 50 13 CDR 93, 00, 00 - ... 0093,ENTER; plus 00000,ENTER; 09300, ENTER - Oops! Try it again; VERB 25, NOUN 84, ENTER.

03 20 50 42 CMP I'm getting a look at your engine down here, and it looks pretty clean.

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Tape 09-03601

03 20 50 46 LMP Good. I can't see much except your nose, so right now I can't even see that. Okay, how close are - we're still a little ways away.

03 20 51 24 CDR Boy, if you ever got out against that sunlight that, we'd have it.

03 20 51 30 LMP 30 degrees of yaw remain. We want to go GUIDANCE CONTROL to PGNS.

03 20 51 48 LMP PGNS now. Oh yes, oh yes.

03 20 51 49 CDR ... you got -

03 20 51 51 LMP Let me get a picture of that. Oh boy, that's pretty. I'll get the whole thing with you in the foreground sort of.

03 20 51 57 CDR Oh, go ahead - let's just take a picture of him, the heck with it.

03 20 52 03 CDR Hey, I'll call up the VERB 77 -

03 20 52 05 LMP No, not - okay, just hit the 77. Okay, GUIDANCE CONTROL to PGNS, MODE CON - ATTITUDE CONTROL to MODE CONTROL YAW. Okay. Call on the ENTER.

03 20 52 18 CMP I can see your skip rudder when I back off just a bit.

03 20 52 21 CDR Roger.

03 20 52 30 CDR Okay, and this ought to be in nice style.

03 20 52 31 CMP Yes.

03 20 52 33 CDR Okay, 3, 2, 1.

03 20 52 37 CDR HACK.

03 20 52 38 CDR It's not bad. Okay Dave, we - we can take over the stationkeeping here.

03 20 52 45 LMP Okay, hit the VERB 77 ENTER.

03 20 52 50 CMP Spider, I've got a slight up movement on you.

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03 20 52 52	CDR	Okay.
03 20 52 53	LMP	Okay, GUIDANCE CONTROL to AGS.
03 20 52 54	CMP	You've got the stationkeeping.
03 20 52 56	LMP	Stationkeeping. Let's see - let me look at the AGS here. Okay, GUIDANCE CONTROL to AGS. You ready.
03 20 53 00	CDR	No - that's working; it's so dim I just can't see it.
03 20 53 03	LMP	You ready, Jim?
03 20 53 04	CDR	To AGS - go ahead.
03 20 53 06	LMP	Okay, we are in AGS. Okay, LM in active station-keeping. VERB 83, ENTER. Okay, and you want to adjust ORDEAL. Okay, he must be over your side.
03 20 53 25	CMP	God-blessed, that ORDEAL isn't working at all, Rusty.
03 20 53 27	LMP	It isn't.
03 20 53 28	CMP	No.
03 20 53 29	LMP	153 degrees.
03 20 53 30	LMP	Well, I don't know if you can set it out of plane.
03 20 53 32	CDR	Yes, I can set it out of plane - set it out of plane before, at least it stays somewhere near -
03 20 53 36	LMP	Have you got the power on and everything?
03 20 53 37	CDR	Yes.
03 20 53 38	LMP	And Earth rate.
03 20 53 40	CDR	Yes.
03 20 53 43	LMP	Okay, 153.6. Okay, PROCEED. Let me just check that here. What do you want - you want to take a picture of him ...

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Tape 09-03601

03 20 53 55 CMP I'm starting to maneuver to SEP attitude at this time.

03 20 53 59 CDR Okay.

03 20 54 00 LMP Gee, yes, I'd like to get a picture of him. Oh, shoot. Can you yaw a little bit, Jim.

03 20 54 10 CMP No, I'm not going to do that. That AGS control is - just won't work.

03 20 54 12 CDR Try it in PULSE.

03 20 54 13 CDR Can you do it in PULSE?

03 20 54 15 CMP I'm translating over there slowly.

03 20 54 17 CDR Okay.

03 20 54 21 CMP Okay, I'll just miss his attitude maneuver.

03 20 54 25 CDR Did you get the lens cover off? You got the lens cover on, haven't you?

03 20 54 28 CDR Yes, you do. (Laughter) Great!

03 20 54 33 CDR Hey, why don't you give me the - this camera.

03 20 54 34 LMP Okay, here go ahead.

03 20 54 42 LMP You want me to stationkeep just a bit?

03 20 54 43 CDR No, we'll just let it run.

03 20 54 45 LMP Okay.

03 20 55 17 CDR My window is in the shade here, I don't know how we ever - I guess we didn't really figure the sun very well for that, did we? We figured the sun ought -

03 20 55 27 LMP Okay, 17 minutes - it's 7 minutes - -

03 20 55 28 CDR Did you set any - can you get movies of him now?

03 20 55 29 LMP No, he's - he's up too high and over too far.

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Tape 09-03601

~~CONFIDENTIAL~~

03 20 55 33 CMP Why don't you unmount the camera and try to hold it.

03 20 55 36 LMP I can't even see him, Jim.

03 20 55 37 CDR Okay.

03 20 55 56 LMP Okay, you ready to go to PGNS?

03 20 55 58 CDR Yes, I'm ready to go back to PGNS.

03 20 55 59 CMP Okay, going to PGNS.

03 20 56 01 CDR Here, why don't you hold on to this?

03 20 56 02 CMP Okay, tape we're going back -

03 20 56 03 CDR Why don't you hold this and let me turn it to PGNS - I don't want to not have my hand on the handle.

03 20 56 08 LMP Okay.

03 20 56 11 LMP Okay, we're in PGNS - and if you want to comment on the AGS ATTITUDE HOLD there -

03 20 56 18 CDR Yes - didn't seem to be too bad -

03 20 56 19 CMP Well, AGS ATTITUDE HOLD if you don't have to - ATTITUDE HOLD is good; it's the RATE COMMAND that's so atrocious.

03 20 56 31 LMP ...

03 20 56 34 CDR Can you see him at all now?

03 20 56 35 LMP Just barely. Can you get a little higher, Jim?

03 20 56 37 CDR Yes, I'll start - I'm moving up that way now. Okay?

03 20 56 40 LMP Okay, let me have it back now that we've - made this switch.

03 20 56 41 CMP Roger. Gumdrops copy. Carnarvon at 23.

03 20 56 43 CDR Okay.

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Tape 09-03601

03 20 56 52 CMP Okay, Spider. I'm just about at the attitude now in plane, and roll is like your attitude, too.

03 20 56 58 CDR Okay, you look good to us. We're drifting over slowly to the right and up, Rusty.

03 20 57 09 LMP To the left and up?

03 20 57 10 CDR To - to the left, yes.

03 20 57 11 CDR Okay. He's coming over our right, and we're going -

03 20 57 13 LMP Okay, he's coming now.

03 20 57 18 CMP Okay. Thanks, Smokey.

03 20 57 21 CDR Boy, we're sure not hearing them. If this COMM doesn't improve, David, we're going to have an awfully quiet rendezvous.

03 20 57 30 CMP Roger.

03 20 57 33 CDR Okay, I - Why don't you take the pictures and and -

03 20 57 41 LMP Yes.

03 20 57 49 CMP Crew, I have 5 minutes on my mark.

03 20 57 52 CMP 2, 1.

03 20 57 53 CMP MARK.

03 20 57 54 CDR Roger. We're right with you.

03 20 57 55 LMP Right with you.

03 20 57 56 CMP Okay.

03 20 57 58 LMP Are you stationkeeping now?

03 20 58 02 CDR Well - why don't we just let it drift?

03 20 58 04 LMP Okay.

03 20 58 05 CDR It's not going anyplace.

~~CONFIDENTIAL~~

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Tape 09-03601

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03 20 58 06	LMP	That was my one chance. (Laughter)
03 20 58 09	CDR	You'll get another chance.
03 20 58 10	LMP	No, I won't - where?
03 20 58 12	CDR	Not until we get back.
03 20 58 26	LMP	Okay, looks like we've got just a little bit of roll.
03 20 58 29	CDR	Okay.
03 20 58 34	CDR	Okay, that's enough on the movies, let me go back to business here.
03 20 58 38	LMP	Okay, VERB 84. You have that all loaded?
03 20 58 40	LMP	VERB 84 is all loaded.
03 20 58 41	CDR	Okay.
03 20 58 47	CDR	Okay, when he starts up -
03 20 58 58	LMP	Okay, I'm ready with the VERB 76. Okay, let me take a few - Oh hell, you've got a - You want me to take some more that way? You've got 3 minutes here.
03 20 59 08	CDR	No, I don't want to take any more pictures.
03 20 59 09	LMP	Okay, I'll try to get one here.
03 20 59 14	CDR	There goes a name-plate off of something.
03 20 59 23	LMP	Yes, I see it.
03 20 59 24	CDR	Yes.
03 20 59 30	CMP	Okay, I got to get - I got to get into 76 here, Rusty.
03 20 59 36	LMP	Roger. 76 is right here, and I'm all ready to hit ENTER.

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Tape 09-03601

03 20 59 42 CMP It's all set up.

03 20 59 47 LMP OFF, damn it; tape OFF, CLOSED.

03 20 59 49 CDR AOT LAMP BREAKER is CLOSE.

03 20 59 51 LMP AC BUS B only, right?

03 20 59 52 CMP AC BUS B; that's right. Okay.

03 21 12 39 CDR Rusty, let me - get this off of here, it's sort of in the way.

03 21 12 44 LMP Okay. I'm - I'm going to take it - Okay, go ahead.

03 21 12 53 LMP Okay. We're ready for the maneuver, ready?

03 21 12 56 CDR Okay, go.

03 21 12 58 LMP Okay, here goes the maneuver. Gee. Great Scott! Okay, the ERROR needles are coming in, not yet, almost. 3, 2, 1.

03 21 13 38 LMP MARK.

03 21 13 40 LMP How's that for a shock?

03 21 13 44 CDR Oh, my goodness. Wonder what happened?

03 21 13 46 LMP What?

03 21 13 47 CDR I saw it coming right on down and then -

03 21 13 52 CDR Okay, you're - you're clear to MARK on either.

03 21 13 55 LMP You could see it?

03 21 13 57 CDR Yes, I could but, it's just, it's disappearing out there - what's - -

03 21 14 01 LMP Is the radar in the way?

03 21 14 02 CDR I don't know; I can't tell. There, I can see it now.

03 21 14 07 LMP Maybe it's exit pupil. It may be moving in and out of it.

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Tape 09-03601

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03 21 14 16 LMP Okay, you're clear to mark on either. You think you can mark on it now?

03 21 14 32 CDR I'm clear to mark either?

03 21 14 34 LMP Yes.

03 21 14 36 CMP Okay, which way do you want it?

03 21 14 38 CDR Oh boy, that reticle is terrible, too.

03 21 14 42 CDR Up, 2, DOWN. Whoooo, stop, to LEFT/RIGHT.

03 21 14 50 CMP It's not moving.

03 21 14 52 CMP Hello, Spider; Gumdrop. I've got my alignment and third star check on two bright stars.

03 21 14 58 CDR Okay, give me about 2 UP.

03 21 14 59 LMP 2 UP.

03 21 15 00 CDR And about 2 LEFT. I got a Y - I got an X in there, didn't I? 1 RIGHT.

03 21 15 07 LMP Yes, you're clear to mark - -

03 21 15 08 CMP 1 RIGHT and stop - -

03 21 15 09 CDR 1 RIGHT and stop the UP/DOWN.

03 21 15 17 LMP You're clear to mark Y.

03 21 15 18 CDR Okay, marking Y.

03 21 15 19 LMP Okay, you're clear to mark either.

03 21 15 22 CDR Okay. Well, give me 1 RIGHT.

03 21 15 24 LMP 1 RIGHT.

03 21 15 29 CDR Clear to mark X. Okay, give me about 2 DOWN.

03 21 15 32 LMP 2 DOWN.

03 21 15 33 CDR Okay; 1 UP.

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Tape 09-03601

03 21 15 34 CMP 1 UP.  
03 21 15 35 LMP Looks like one's going to do it.  
03 21 15 37 CDR Yes.  
03 21 15 39 LMP CLEAR to mark X.  
03 21 15 41 CDR Okay.  
03 21 15 42 LMP CLEAR to mark either.  
03 21 15 43 CDR Give me about 1 UP.  
03 21 15 44 LMP 1 UP.  
03 21 15 51 LMP Looks like another 1?  
03 21 15 52 CDR Yes, 1 more UP.  
03 21 15 53 LMP 1 more UP.  
03 21 16 00 LMP Okay, we're in the middle of our's, Gumdrop; we'll be right with you.  
03 21 16 04 CDR Okay, about 1 LEFT.  
03 21 16 08 LMP CLEAR to mark Y. This is the third set.  
03 21 16 13 CDR I can take five; I'm going to take all five.  
03 21 16 15 LMP Right.  
03 21 16 22 LMP Okay, CLEAR to mark either.  
03 21 16 28 CMP Okay, give me one RIGHT.  
03 21 16 30 LMP 1 RIGHT.  
03 21 16 38 LMP How about stopping the UP/DOWN?  
03 21 16 40 CDR Okay, give me about 2 DOWN.  
03 21 16 43 LMP 2 DOWN.  
03 21 16 44 CDR That was the fourth set, wasn't it?

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Tape 09-03601

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03 21 16 45	LMP	Yes.
03 21 16 48	CDR	I'm going to mark X, right?
03 21 16 49	LMP	Right.
03 21 16 50	CDR	1 UP.
03 21 16 51	LMP	1 UP.
03 21 16 56	CDR	Okay, now - -
03 21 16 57	LMP	CLEAR to mark either.
03 21 16 58	CDR	1 UP.
03 21 16 59	LMP	1 UP. How about stopping the LEFT/RIGHT?
03 21 17 01	LMP	Yes.
03 21 17 02	CDR	Okay.
03 21 17 05	LMP	Another UP.
03 21 17 06	CDR	Another UP.
03 21 17 08	CDR	Another UP.
03 21 17 14	LMP	Okay, CLEAR to mark Y.
03 21 17 18	CDR	This is almost as hard to use as the simulator.
03 21 17 34	CMP	Is it coming?
03 21 17 35	CDR	It's coming.
03 21 17 40	LMP	Stop the UP/DOWN - -
03 21 17 41	CDR	Yes.
03 21 17 42	LMP	That's the last mark. To hell with it.
03 21 17 48	LMP/CDR	Okay.
03 21 17 51	LMP	See it move back a minute?
03 21 17 56	CDR	Let me look at something just a minute here.

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Tape 09-03601

03 21 18 01 CDR Okay, here comes the Acrux now.

03 21 18 03 LMP Okay. Ready?

03 21 18 07 LMP Ready, GO. AUTO MANEUVER. GO.

03 21 18 16 LMP ...

03 21 18 18 CDR Yes.

03 21 18 20 LMP Could you tell that was Sirius?

03 21 18 22 CDR Yes, it's definitely Sirius.

03 21 18 24 LMP Gee, you could identify all this - It's not even dark yet. Boy, there's the Gumdrop.

03 21 18 30 CDR That's Canopus over there.

03 21 18 33 LMP Okay.

03 21 18 38 CDR There's a whole mass -

03 21 18 39 LMP Boy, it looks just like the simulator in the ball. Man, it is coming right down the same way.

03 21 18 42 CMP ...to do.

03 21 18 44 CDR Roger, great. This AOT is really not a very good optical instrument, I tell you. Hey, there's Acrux. Whooooo, pretty close!

03 21 18 59 LMP Okay - okay, you're CLEAR to mark either.

03 21 19 05 CDR Can you pull that right - right window shade up, Rusty?

03 21 19 08 LMP Okay, right window shade coming up. Stand by and let me see if I can get that up there. Okay.

03 21 19 19 CDR Oh, let's turn down some lights. My God, we never even turned off any lights.

03 21 19 20 LMP Oh.

03 21 19 24 CDR That help any? Let me get - -

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Tape 09-03601

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02 21 19 25	LMP	Yes, that helps a lot.
03 21 19 26	LMP	Here, let me get up some for you.
03 21 19 28	LMP	Okay, listen. What you've got in there right now is good.
03 21 19 29	CDR	You should have to pitch up a good bit.
03 21 19 32	LMP	Yes, oh yes, pitch up and - -
03 21 19 36	CDR	Okay, it's - -
03 21 19 37	LMP	Under the right too.
03 21 19 38	CDR	Yes, I got the one at the right end.
03 21 19 41	LMP	Okay, pitching back down. Okay, how's that?
03 21 19 48	CDR	You're too close. 1 more to the RIGHT.
03 21 19 50	LMP	1 more RIGHT.
03 21 19 52	CDR	And just let it drop down.
03 21 19 53	LMP	Okay.
03 21 20 10	CDR	It's going to be in X.
03 21 20 11	LMP	Okay.
03 21 20 13	LMP	Stop the LEFT/RIGHT, or not?
03 21 20 16	CDR	Stop the LEFT/RIGHT.
03 21 20 17	LMP	Yes. Okay.
03 21 20 18	CDR	1 more UP.
03 21 20 20	LMP	Okay.
03 21 20 24	LMP	Oh, we're way over control. Am I glad we don't have to do one with an ascent only!
03 21 20 30	CDR	Well, we still need UP RIGHT.
03 21 20 31	LMP	Yes, one more UP.

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Tape 09-03601

03 21 20 35 CDR There - there it goes.

03 21 20 38 LMP Boy, oh boy, everything is so bright in here.

03 21 20 41 LMP Okay, CLEAR to mark Y.

03 21 20 42 LMP Want to turn down your lights before you do that, or not?

03 21 20 46 CDR If you want to reach over there.

03 21 20 47 LMP I can't reach them.

03 21 20 49 CDR I don't want to mess with them, yet.

03 21 20 50 LMP Okay. CLEAR to mark Y.

03 21 20 52 CDR Give me 1 to the RIGHT, LEFT.

03 21 20 53 LMP Okay. 1 DOWN?

03 21 20 58 CDR No. Stop - yes, stop to dial -

03 21 21 01 LMP Okay, yes, right.

03 21 21 03 CDR I wanted to get down a little bit farther there -  
You can't get the -

03 21 21 14 CDR 1 more RIGHT.

03 21 21 16 LMP RIGHT or LEFT.

03 21 21 17 CDR LEFT, I mean.

03 21 21 19 CDR Never mind. Just leave it like it is now.

03 21 21 20 LMP Okay.

03 21 21 29 LMP Okay, mark either.

03 21 21 31 CDR Okay, give me a - 1 RIGHT.

03 21 21 34 LMP 1 RIGHT.

03 21 21 35 CDR 1 UP, too.

03 21 21 36 LMP 1 UP, too.

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Tape 09-03601

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03 21 21 38	CDR	Okay, 1 more RIGHT.
03 21 21 39	LMP	1 more RIGHT.
03 21 21 58	LMP	How you coming?
03 21 21 59	CDR	Okay, just let it go.
03 21 22 00	LMP	Okay. I'd like to kill a roll pulse here.
03 21 22 02	CDR	No, not yet.
03 21 22 03	LMP	Okay.
03 21 22 07	CDR	Okay, now you can.
03 21 22 09	LMP	Okay.
03 21 22 11	CDR	Okay, give me 1 DOWN - What am I marking now?
03 21 22 13	LMP	You're marking X.
03 21 22 14	CDR	Good. Hey, it's harder than hell to get this star focused and the reticle focused, too. They're not even focused in the same spot. You know, you're looking for the exit pupil of one; doesn't seem to be where the exit pupil of the other is.
03 21 22 30	LMP	Okay, CLEAR to mark X.
03 21 22 38	CDR	Okay. 1 UP.
03 21 22 40	LMP	CLEAR to mark either.
03 21 22 42	CDR	1 on UP.
03 21 22 43	LMP	1 on UP.
03 21 22 45	CDR	Another 1 UP.
03 21 22 46	LMP	Another 1 UP.
03 21 22 48	LMP	Boy, this pulse is really nice.
03 21 22 55	LMP	Okay, CLEAR to mark Y.
03 21 22 56	CDR	Okay, - -

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Tape 09-03601

03 21 22 59 CC Gumdrop/Spider, Houston through Carnarvon;  
standing by.

03 21 23 01 LMP 1 LEFT.

03 21 23 03 CDR - - okay, 1 LEFT.

03 21 23 04 LMP Which set was that?

03 21 23 06 CC Gumdrop ...

03 21 23 07 LMP That was about the - I think this was the third.

03 21 23 10 CC ... confirm SEP burn.

03 21 23 11 CMP Roger. SEP burn on time. Good burn, and every-  
thing's looking good.

03 21 23 16 LMP Okay, mark either; that was the third set.

03 21 23 21 CDR Take 1 RIGHT.

03 21 23 22 LMP 1 RIGHT.

03 21 23 24 LMP Stop the UP/DOWN.

03 21 23 25 CDR No.

03 21 23 32 CDR And Spider is here. We've finished marking our  
Sirius, and we're in our fourth set on Acrux.

03 21 23 38 LMP Okay, now - -

03 21 23 39 CC Roger, Spider; you're loud and clear.

03 21 23 40 CDR Okay, now 1 DOWN. And 1 RIGHT, too.

03 21 24 01 LMP Stop the LEFT/RIGHT?

03 21 24 03 CDR No.

03 21 24 10 LMP Okay, that was the fourth set.

03 21 24 11 CDR Okay, 1 UP.

03 21 24 12 LMP 1 UP. CLEAR to mark either. Can I stop that  
LEFT/RIGHT, yet?

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Tape 09-03601

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03 21 24 14 CDR Yes.  
03 21 24 15 CDR Okay.  
03 21 24 18 CDR You need that one more right now.  
03 21 24 21 LMP Okay.  
03 21 24 29 LMP CLEAR to mark Y.  
03 21 24 30 CDR Okay, just let it go.  
03 21 24 32 LMP Okay.  
03 21 24 33 LMP Let me get one roll pulse here.  
03 21 24 34 CDR No, just - just delay.  
03 21 24 36 CDR Okay.  
03 21 24 46 LMP Okay. Ready?  
03 21 24 48 CDR Ready.  
03 21 24 51 LMP Oh my aching back! Would you believe 5 zero's?  
(Laughter)  
03 21 24 57 CMP Beautiful.  
03 21 24 58 CC Roger. Spider.  
03 21 25 02 LMP (Laughter) McDivitt!  
03 21 25 04 CDR Okay, let's do the next one.  
03 21 25 05 LMP Okay.  
03 21 25 06 LMP We're way - okay, stand by here. We've got to  
get the COAS going. Okay, let me get - copy them  
down here.  
03 21 25 17 CDR I can see Gumdrops down there.  
03 21 25 21 LMP Okay, 93 is minus 0.090 - -  
03 21 25 30 CC That looks mighty pretty, Spider.  
03 21 25 31 LMP - - minus 0.076 - -

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Tape 09-03601

03 21 25 33 CDR Thank you.

03 21 25 36 LMP Plus 0.111. Boy, that docked alignment turned out good, didn't it? Holy smokes! Ready to gyro torque?

03 21 25 41 CDR Ready, babe.

03 21 25 42 CMP Okay, there they go.

03 21 25 45 LMP Okay. PROCEED, ENTER.

03 21 25 50 LMP Okay, you ready for your COAST?

03 21 25 52 CDR Go.

03 21 25 54 CMP Okay, 2's - 526. I want to do VERB 21, ENTER; 526, ENTER. Okay, PRO, VERB 22, ENTER; plus all zeros - that darn.

03 21 26 12 CDR Regulus should be way over there.

03 21 26 13 LMP Okay, you ready? Here we go.

03 21 26 14 LMP No, not Regulus now. This is not Regulus.

03 21 26 16 CDR That's right; that's the other one.

03 21 26 18 LMP Spica.

03 21 26 19 CDR Spica, oh shoot, we're not going to be able to see Spica.

03 21 26 21 LMP Well, we will when we pass the horizon.

03 21 26 27 CDR No ... the moon's going to be in the way.

03 21 26 29 CDR Oh.

03 21 26 30 CMP Spider, Gumdrop, I can see your jets firing just as clear as a bell.

03 21 26 34 CDR Roger. I was watching your light down there. Stop right there.

03 21 26 37 CMP You just gave a big burst, didn't you?

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Tape 09-03601

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03 21 26 39 CDR Roger. Well, there's a star out there, and it's right next to the moon. And that's where Spica ought to be.

03 21 26 44 LMP Can - okay, now stand by and let me - zero some things for you.

03 21 26 50 CMP Here, let me -

03 21 26 52 CC Gumdrop, Houston. Did you do a P52?

03 21 26 56 CMP Roger. And stand by, and I'll give you the angles.

03 21 26 59 CC Roger.

03 21 27 05 CMP It will be about 5 minutes.

03 21 27 06 LMP It's right on in yaw, and it's right on in pitch now.

03 21 27 12 CDR Okay, it's a half of a degree out in yaw, right out in pitch.

03 21 27 14 LMP Okay. PROCEED, PROCEED, PROCEED. Okay, now let me just check my - where I am here. Okay, the time now is 93:27:30. Okay, and - we've got the position of the star - we're there. Okay, we want to do a VERB 34. Okay, VERB 34, ENTER. Okay, and you can to CB(11), AC BUS B, AOT LAMP, OPEN.

03 21 28 05 CDR It's open. Close ...

03 21 28 10 CDR Okay.

03 21 28 18 LMP Okay. Come on, baby. Okay, I'm updating and aligning the AGS, and we're 6 minutes up. We've never been here before.

03 21 28 33 CDR Yes.

03 21 28 41 LMP 5 zeros. McDivitt, you're fantastic!

03 21 28 47 CDR I'll take that beer.

03 21 28 48 LMP Yes.

03 21 28 49 CDR Where are - where are we?

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Tape 09-03601

03 21 28 50 CMP Okay, tape is coming off.

03 21 28 51 CDR Where - where are we, Rusty?

03 21 28 52 LMP We're at - no, I'm going to leave the tape on. Excuse me. We're at rendezvous - We're at minus 13 minutes on phasing. We're coming up on phasing 16.

03 21 29 03 CDR And you're updating the AGS, okay?

03 21 29 05 LMP Right. 8 feet per second free spectrum, and we're 0.14 - 1.6 miles away.

03 21 29 14 CDR Right.

03 21 29 19 CMP Okay, here goes the alignment on the AGS. Nicely. Okay.

03 21 29 26 CC Okay, Spider and Gumdrop - -

03 21 29 28 LMP We'll proceed now.

03 21 29 29 CC - - this is Houston. I'll lose you over Carnarvon in about a minute, and bring up your S-band volumes about that time. We'll have you at Honeysuckle.

03 21 29 36 CDR Okay.

03 21 29 38 LMP Okay, CB (11), AC BUS A, RENDEZVOUS RADAR, CLOSE. You got that?

03 21 29 41 CDR Okay, RENDEZVOUS RADAR CLOSED.

03 21 29 42 LMP/CDR Okay, - that's in - -

03 21 29 43 LMP Okay, that's in 30 seconds.

03 21 29 47 CDR Okay, shouldn't we make an AUTO maneuver here?

03 21 29 50 CDR Right.

03 21 29 51 LMP The VERB 89, ENTER. And you want the Z-axis, so it's a plus 1, and it's a PRO. And there's going to be the roll pitch and yaw. And a PRO. Okay, ready to maneuver?

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Tape 09-03601

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03 21 30 03 CDR I'm ready.

03 21 30 04 LMP Okay. PRO. Boy, it really goes off with a bang, doesn't it?

03 21 30 13 CDR Yes. Keep an eye on that propellant.

03 21 30 21 LMP Yes.

03 21 30 27 LMP Okay, you got the time up, yet?

03 21 30 30 CDR 42 - not quite, yes. It is. So we're missing him.

03 21 30 37 LMP Oh, that's okay. I wouldn't sweat that one.  
PRO. Okay, RENDEZVOUS RADAR to SLEW, you want to track the CSM with the COAS, and you are in PULSE. Okay, and you got a roll - 25 degrees to the left.

03 21 31 07 CDR Yes, let me get up there to them.

03 21 31 10 LMP Okay, want me to turn some lights down for you?

03 21 31 14 CDR No, I can see them fine. Surely they got a good light out there. Getting close, anyway.

03 21 31 19 CMP I don't see it. Where is he?

03 21 31 20 CDR He's right at - he's right down the Z-axis about a half - No - oh, he just fired a bunch -

03 21 31 28 LMP Oh, hell, I got my window shade up. No wonder I can't see.

03 21 31 35 CMP Spider, Gumdrop, I've got you at 1.78 miles and 4.8 feet per second.

03 21 31 40 CDR Okay.

03 21 31 46 LMP Are you firing a lot out there?

03 21 31 49 CMP Yes, just spurts. Yes, look.

03 21 31 53 CDR Yes, it actually put your light out; I can't even see it.

03 21 31 56 CMP Just pulsing.

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Day 4 - Page 169  
Tape 09-03601

03 21 32 00 CDR I don't care what it is; it'll put your light out, man!

03 21 32 03 LMP Okay, we're on him right now.

03 21 32 06 CDR Okay, you want to lock your RADAR, ON?

03 21 32 13 LMP Go to SLEW, don't we, here?

03 21 32 18 CDR Stand by.

03 21 32 19 LMP Hey, don't we want to go to SLEW?

03 21 32 20 CMP Gumdrop, Spider; do you have your light on?

03 21 32 25 LMP Oh shoot! Yes, now.

03 21 32 27 CDR Slew it to zero for me will you, Rusty?

03 21 32 31 LMP Okay. Say, what you want to pass, Houston?

03 21 32 41 CC Roger, I want to update your redlines on the - your DPS - your oxidizer to fuel is - -

03 21 32 50 CDR Are you ready?

03 21 32 51 CC - - redline is - -

03 21 32 52 LMP Go.

03 21 32 53 CC - - 25 - 25 versus the 12 as shown on your check-list.

03 21 32 58 LMP Roger, understand 25 percent on the redline for oxidizer.

03 21 33 05 CC No, it's a DELTA-P of 25 psi oxidizer to fuel.

03 21 33 13 LMP Okay, 25 DELTA-P oxidizer to fuel is a redline.

03 21 33 20 CC That's affirmative.

03 21 33 22 CDR Okay, we're locked on. Good, solid.

03 21 33 23 CC In other words, they are both 25 now?

03 21 33 28 CDR Roger. Got you.

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Tape 09-03601

~~CONFIDENTIAL~~

03 21 33 32 LMP

Okay, let me see where we are, now. Okay, VERB 70, VERB 89, okay. RENDEZVOUS RADAR? Okay, RENDEZVOUS RADAR to AUTO TRACK. Okay. You've got it there. Main load lock ON; you want to verify that.

03 21 33 43 CMP

I have.

03 21 33 44 CDR

Okay. Here comes a VERB 83.

02 31 33 45 CMP

Plus 00035, minus 00109.

03 21 33 53 LMP

Did you get the landing radar breaker closed too, Jim?

03 21 33 56 CDR

No, I didn't.

03 21 33 57 LMP

Okay. You want to get that one?

03 21 34 02 CDR

You know he actually - he puts out his light when he fires this stuff.

03 21 34 04 LMP

Yes, doesn't he? He puts out a whole cloud.

03 21 34 08 CDR

Fantastic.

03 21 34 09 LMP

Hey, you want to adjust the ORDEAL here.

03 21 34 12 LMF

353. Right on the money.

03 21 34 15 CDR

Yes, it's doing all right now.

03 21 34 18 LMP

Okay. You don't want to adjust it?

03 21 34 20 CDR

No, it's all right.

03 21 34 21 LMP

Okay. We've got about 8 feet per second and  
2.225 - -

03 21 34 23 CDR

Why - why don't you leave it there until I get  
right side up - -

03 21 34 25 LMP

Let's see how we score on that.

03 21 34 27 CDR

Okay. That's a little bit off now.

03 21 34 30 CC

Spider and Gumdrop, this is Houston. You are GO  
for phasing.

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Tape 09-03601

03 21 34 34 CDR Roger, Houston. Understand we are GO for phasing.  
03 21 34 37 CMP Gumdrop copies.  
03 21 34 38 LMP Okay, we're going to have a few updates, Jim; it looks like we've got a little bit different here.  
03 21 34 45 CDR Okay.  
03 21 34 47 LMP Okay. When we are going to P20?  
03 21 34 48 CDR Okay. Go ahead.  
03 21 34 49 CC And Gumdrop, you might anticipate a MASTER ALARM on your H<sub>2</sub> tank pressure.  
03 21 34 52 LMP No, we are not going into P20 now, Jim; we're - -  
03 21 34 54 CDR No, yes, no. Not when I was really - I was just acknowledging the fact that - when we go there, we're going to get a - -  
03 21 35 01 LMP Yes. Okay.  
03 21 35 02 CDR Probably an update.  
03 21 35 05 LMP Okay. We're going to bypass the maneuver.  
03 21 35 10 CDR Boy, I wish I had some rate needles I could use.  
03 21 35 12 LMP Enter on that - Okay. We've got 12 minutes until the burn, and we're up to about - Hell, we're about 12 minutes. What do you know!  
03 21 35 23 CDR Okay.  
03 21 35 24 LMP All of a sudden we're back on the time line.  
03 21 35 28 LMP Okay. NOUN 86, ENTER. Okay. Let me copy those down. Plus 1.2, minus all zips, and minus 90.7 - Okay, but I'm going to use the pad anyway. Okay. I'll do a KEY RELEASE.  
03 21 35 45 CMP Spider, Gumdrop.  
03 21 35 46 LMP Go ahead.

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Tape 09-03601

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03 21 35 48 CMP May I have this crossing late?

03 21 35 52 LMP Okay.

03 21 35 59 CDR Man, when your thrusters fire, it just puts out a great big orange cloud I can see way back here.

03 21 36 03 CMP Yes, yours too.

03 21 36 11 LMP Okay. Now I need that pad, okay, I got it.

03 21 36 18 CDR Looks like somehow or other, we're out of plane, too. Boy, I sure could use those 1 degree per second rate needles in that - or at least a set of rate needles that were accurate.

03 21 36 33 LMP Yes.

03 21 36 39 LMP We are alright there.

03 21 36 52 CDR Gumdrop, did you ever pick up my light again?

03 21 37 02 CMP Roger.

03 21 37 03 CDR Okay.

03 21 37 05 CMP I've got your light ...

03 21 37 08 CDR Okay.

03 21 37 10 CDR I have a showing about a degree or so out of plane already.

03 21 37 14 LMP That's not too surprising.

03 21 37 17 CDR What?

03 21 37 18 LMP At this close range, Jim, that's not a surprise, I guess.

03 21 37 23 CDR Well, I really didn't expect it. It surprises me.

03 21 37 36 CDR Okay, at 10 minutes to go: Okay.

03 21 37 37 LMP Did you get to VERB 78, ENTER?

03 21 37 43 CMP It was ... minutes late for the crossing and I don't know why.

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Tape 09-03601

03 21 37 45 CDR You gave us what?

03 21 37 47 CMP About 7 minutes late for that horizontal crossing.

03 21 37 49 CDR Oh, really?

03 21 37 50 CMP Yes, I don't understand it Rusty.

03 21 37 54 CDR Gee, we're just about crossed right now. We're look - we're going to be looking up at you, I think, here, if I pitched all the way around.

03 21 38 01 CDR No, I don't mean that.

03 21 38 04 CMP Oh, my ORDEAL slewed good.

03 21 38 06 LMP Boy, we're right on 286 in the pitch, Jim.

03 21 38 10 CDR Okay.

03 21 38 11 LMP Okay. Did - did you get VERB 78 in?

03 21 38 12 CDR I'll get it when I do - -

03 21 38 15 LMP I got it. VERB 78, ENTER. Okay.

03 21 38 25 LMP Okay. Let me see where we are now. Okay. We got the cumulative DFI POWER, ON.

03 21 38 33 CDR DFI POWER, ON.

03 21 38 34 LMP PRPLNT QUANTITY MONITOR, DESCENT 1 and 2.

03 21 38 36 CDR PRPLNT QUANTITY, DESCENT 1; DESCENT 2.

03 21 38 39 LMP Standing by for 6 minutes. Okay. Here we go: if no DPS ignition, or premature shutdown, do not restart. Okay. Okay, it says, "Null only Y and D residuals."

03 21 38 52 CDR Okay.

03 21 38 55 LMP If the X residual is less than 20 feet per second, perform insertion as planned. If the X residuals are greater than 20 feet per second, eventually do not - do NCC NSR.

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Tape 09-03601

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03 21 39 10 CDR Okay.

03 21 39 11 LMP Okay. Do not stage. Terminate burn, if the attitudes are greater than 10 degrees, attitude errors greater than 10 degrees, rates greater than 5 degrees per second, 3 second overburn or equivalent.

03 21 39 24 CDR Okay. Do you know the burn time on this? We don't even have it.

03 21 39 27 LMP No, we don't ever have a burn time.

03 21 39 29 LMP Okay. Standing by for 6 minutes. So let me just check all the RCS and everything.

03 21 39 33 CDR Okay. What do we do here? We slip throttle profile. It's all - -

03 21 39 38 LMP And throttle up to 40 at 5 seconds.

03 21 39 40 CDR To 40 percent. We'll just stay there.

03 21 39 47 LMP Okay. Okay. That's 25. Okay. Do we have a DELTA-P of 25 in the DPS between oxidizer and fuel.

03 21 40 01 CDR Now, whoa, whoa, tight.

03 21 40 05 LMP Okay. We're looking like about - -

03 21 40 07 CDR Its 12.

03 21 40 08 LMP 12, yes. Okay. So we're - -

03 21 40 09 CDR We got ULL limit, wasn't it?

03 21 40 12 LMP (Laughter) Yes. As a matter of fact, OX HIGH, too. I guess that's why they gave it to us.

03 21 40 23 LMP Okay. In 6 minutes, we're going to do the inverters. Then we're going to go to PULSE, and you're going to gun control the AGS, and fly the AGS errors to zero.

03 21 40 43 LMP McDivitt, I can't believe that alignment.

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Tape 09-03601

03 21 40 45 CDR (Laughter) Neigher can I. Don't tell anybody though.

03 21 40 46 LMP Gee.

03 21 40 54 CDR There's the one spot on this floor I need a hunk of Velcro I don't have one.

03 21 40 58 LMP Okay. 407 seems to be holding right now, for some reason.

03 21 41 03 CDR Okay. All right, let's start this thing a little early the first time through it here.

03 21 41 06 LMP Okay. EPS INVERTER 1, CLOSED.

03 21 41 08 CDR INVERTER 1, CLOSED.

03 21 41 10 LMP Okay. I'm going to INVERTER 1. Okay. We're on INVERTER 1.

03 21 41 17 LMP Okay, we didn't glitch anything. Cross tie balance loads coming OPEN. But let me tell you what your BUS does. It dropped to 29 - 29.4.

03 21 41 30 CDR What's - what's the other one.

03 21 41 31 LMP Just a little above that; 30 something.

03 21 41 32 CDR That's okay.

03 21 41 34 LMP Okay?

03 21 41 35 CDR Yes.

03 21 41 38 LMP Okay, we got that done. ATTITUDE CONTROL to PULSE; MODE CONTROL to AUTO.

03 21 41 45 CDR MODE CONTROL to AUTO.

03 21 41 47 LMP Okay, GUIDANCE CONTROL to AGS.

03 21 41 48 CDR GUIDANCE CONTROL to AGS.

03 21 41 50 LMP Fly the AGS nearest to zero.

03 21 41 53 LMP Oops! Hold on.

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Tape 09-03601

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03 21 41 57	LMP	Come on.
03 21 42 04	CDR	Okay, flying to zero.
03 21 42 10	LMP	Woop. Remember, you're not going to be pointing that at them when you do that.
03 21 42 15	CDR	Yes, I realize that.
03 21 42 16	LMP	Okay.
03 21 42 18	CDR	I haven't been ... anyway. Let's see, when I get there, I can just put these things to MODE CONTROL, and yaw looks like it's in pretty good - -
03 21 42 24	LMP	Well, you don't really want to - -
03 21 42 26	CDR	But you don't want to do that too early, here.
03 21 42 27	LMP	No. It'll eat up an awful lot of fuel. That PULSE isn't too bad, because you can feel it; you know it?
03 21 42 32	CDR	Yes.
03 21 42 34	LMP	It turns out it works all right.
03 21 42 44	LMP	Okay, stand by for the 4 minute check. The two clocks are right together.
03 21 42 48	CDR	Okay.
03 21 42 51	LMP	Okay, PGNS says, they're pegged at 5, that's right.
03 21 42 59	LMP	Get up there faster. Okay, we're already to zero range rate.
03 21 43 04	CDR	Yes.
03 21 43 05	LMP	Where are we? We're 16000 up, no 14.
03 21 43 22	CDR	Dave, it looks like we're having a horizontal crossing right about now.
03 21 43 25	CMP	Standing by for your burn.

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Tape 09-03601

03 21 43 27 LMP Oh, no we're not. No, he's not on our Z axis, Jim.

03 21 43 31 CDR Yes, but the range rate is going to zero. We're not up.

03 21 43 34 LMP Yes.

03 21 43 38 LMP Roger, Houston. This is Spider. How do you read?

03 21 43 42 CC You're loud and clear, Spider.

03 21 43 43 LMP Okay. 4-minute check. ENGINE GIMBAL, OFF.

03 21 43 46 CDR ENGINE GIMBAL, OFF.

03 21 43 47 LMP ATTITUDE CONTROL 3 to MODE CONTROL.

03 21 43 52 CDR Okay.

03 21 43 53 LMP Okay, you want to call them?

03 21 43 54 CDR No, let me get them in there.

03 21 43 56 LMP Okay. Looks good, come on roll.

03 21 44 26 CDR Okay, hustle up there. We got a lot to do here.

03 21 44 32 CDR Okay, get going with the checklist.

03 21 44 33 LMP Okay, TTCA, THROTTLE, UP, and MINIMUM throttle. THRUST CONTROL TO MANUAL.

03 21 44 40 CDR THROTTLE, UP, MINIMUM; THRUST CONTROL to MANUAL.

03 21 44 44 LMP Okay, MANUAL THROTTLE to COMMANDER.

03 21 44 45 CDR MANUAL THROTTLE to COMMANDER.

03 21 44 46 LMP Verify MODE CONTROL, AUTO.

03 21 44 50 CDR MODE CONTROL in AUTO.

03 21 44 51 LMP ENGINE ARM to DESCENT.

03 21 44 52 CDR ENGINE ARM to DESCENT.

03 21 44 53 LMP X-TRANSLATION, 2 JET.

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03 21 44 55 CDR 2 JET.

03 21 44 56 LMP BAL COUPLES, ON.

03 21 44 57 CDR BAL COUPLES, ON.

03 21 44 58 LMP Okay, ABORT PRESS, to ON.

03 21 45 00 CDR ABORT PRESS, to ON. You got your stop -

03 21 45 02 LMP I got it. Okay, verify DPS and APS, temperatures, and pressures. We got 28 seconds to the 2 minute.

03 21 45 11 CDR They look good.

03 21 45 14 LMP Okay. How's that PGNS error look?

03 21 45 17 CDR 4 degrees. SUPERCRIT pressures back up again. Can't be anywhere there except ambient.

03 21 45 24 CDR Okay, stand by for 2 minutes. It'll be 2 minutes on my mark, Gumdrop.

03 21 45 30 CMP Okay.

03 21 45 33 LMP Oh, gees, I got to get my gloves on.

03 21 45 34 CDR MARK.

03 21 45 35 CMP Right with you.

03 21 45 37 LMP Verify burn attitude compare PGNS and AGS attitude errors. Let's see; PGNS, okay. AGS and DEADBAND. Okay. Okay.

03 21 45 51 CDR Okay, in 8 seconds we're going to start ULLAGE.

03 21 45 57 LMP Okay, why don't you read here, and I'll just - -

03 21 45 58 CDR Okay. We have the 2 minute mark thing done, verified to BURN ATTITUDE.

03 21 46 03 LMP Wait, I'm still - -

03 21 46 04 CDR Take your AGS, ATTITUDE ERRORS.

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Tape 09-03601

03 21 46 06 LMP I'm still watching 407, too, cause I don't want that damn thing to change.

03 21 46 10 CDR Okay. So you got all this other stuff up here, yet. Okay, at 8 seconds, you do plus-X ULLAGE.

03 21 46 17 LMP Right.

03 21 46 18 CDR At 5 seconds, you hit the ENTER.

03 21 46 22 CDR At 5 seconds I turn the ENGINE GIMBAL to ENAGLE.

03 21 46 26 LMP Alright.

03 21 46 28 CDR Okay. 55 I throttle up to 40 percent.

03 21 46 31 LMP Go ahead.

03 21 46 34 CDR Okay, ENGINE OFF. I'll go GUIDANCE CONTROL to PGNS; ABORT PRESS to RESET; ENGINE ARM, OFF; TTCA comes up.

03 21 46 44 LMP Okay, and I'll be copying down the residuals.

03 21 46 46 CDR Okay, and then you PRO.

03 21 46 47 LMP - and burn the -

03 21 46 48 CDR - and burn the residuals off.

03 21 46 49 LMP Right.

03 21 46 55 LMP Okay, I'm going to go ahead and forget about 407, here.

03 21 46 57 LMP Okay.

03 21 47 00 CDR 35 seconds, Gumdrops.

03 21 47 07 CMP Roger.

03 21 47 17 CDR If we get out of control, I'll shut it OFF. Our stop button's uncovered.

03 21 47 20 LMP Okay. You got to go to ENGINE GIMBAL ENABLE; right?

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Tape 09-03601

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03 21 47 22 CDR Right.  
03 21 47 23 LMP Okay.  
03 21 47 24 CDR 10 seconds.  
03 21 47 27 LMP 8 ULLAGE, ON.  
03 21 47 29 CDR Okay.  
03 21 47 30 LMP Okay, and ENTER.  
03 21 47 31 CDR ENGINE GIMBAL, ENABLE.  
03 21 47 35 CDR Okay. Light - there it is.  
03 21 47 36 LMP Okay, ULLAGE, OFF.  
03 21 47 39 CDR Okay.  
03 21 47 41 LMP 71 feet per second remaining.  
03 21 47 43 CDR Little rough there.  
03 21 47 45 LMP Yes, wasn't it. I think it swallowed a little helium. Okay, they're both counting down together.  
03 21 47 52 CDR Together, okay.  
03 21 47 54 LMP Okay, ENGINE, OFF.  
03 21 47 55 CDR Shutdown. Okay controls are off .  
03 21 47 56 LMP Okay. 0.9 minus 10 - minus 1.  
03 21 48 01 CDR GUIDANCE CONTROL to PGNS  
03 21 48 02 LMP In PGNS, okay.  
03 21 48 03 CDR ABORT PRESS to RESET. ENGINE ARM, OFF. TTCA COMMAND to JET. Oh, look at that. That's good. It's a good burn, Gumdrops.  
03 21 48 14 CMP Okay, good.  
03 21 48 16 CDR Got a little rough there when we throttled up.

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Tape 09-03601

03 21 48 18 LMP Gees, it's a hell of a translation.  
03 21 48 21 CMP ... Gumdrop with you.  
03 21 48 26 CDR Holy Christmas!  
03 21 48 27 LMP Okay.  
03 21 48 35 LMP Look's good.  
03 21 48 37 CDR Okay.  
03 21 48 40 LMP Okay, PROCEED. Stand by here.  
03 21 48 48 LMP Okay, I want to do VERB 79, ENTER. You want  
do a CAL.  
03 21 48 50 CDR We want to - we want - Yes.  
03 21 48 53 LMP ENTER.  
03 21 48 54 CDR Fixing the CAL coming on.  
03 21 48 55 LMP Zero zero, ENTER.  
03 21 48 58 CDR Houston, Spider.  
03 21 48 59 LMP ENTER.  
03 21 49 02 CC Spider, Houston.  
03 21 49 04 CDR Roger, the burn was a good one, and we're giving  
you a CAL.  
03 21 49 07 CC Roger. Thank you.  
03 21 49 09 LMP Okay, 500, 501, and 502. After trimming the PGNS,  
were reading 00, and minus 1.  
03 21 49 18 CC Roger. Good work.  
03 21 49 22 CDR Okay, did you get VERB 79 in?  
03 21 49 24 LMP Yes, I did. LANDING RADAR, OPEN.  
03 21 49 26 CDR Okay. LANDING RADAR, OPEN.

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03 21 49 32 CDR RATE ERR MONITOR to RENDEZVOUS RADAR, THROTTLE CONTROL to AUTO. PRPLNT QUANTITY MONITOR, OFF. Okay.

03 21 49 44 LMP ENGINE GIMBAL to ENABLE.

03 21 49 46 CDR It's ENABLE.

03 21 49 47 CDR INVERTER to 2.

03 21 49 50 LMP Am I?

03 21 49 51 CC Everything looks good here, Spider. Good burn.

03 21 49 54 CDR Okay, it was a little rough; it got a little rough and chuggy around 20 percent as I was throttling up. I waited for it and then throttled up - -

03 21 50 03 LMP INVERTER 1, OPEN.

03 21 50 04 CDR You got INVERTER 2, ON?

03 21 50 05 LMP Yes.

03 21 50 06 CDR Okay, INVERTER 1 coming OPEN.

03 21 50 07 CC Roger. We're losing you at the Mercury and we'll see you over Texas about 05.

03 21 50 11 LMP Okay, and you can debrief the burn.

03 21 50 12 CDR Okay, got another?

03 21 50 15 LMP Yes.

03 21 50 16 CDR Okay, as I was - we had a nice slow start again, just like we had previously. However, as I started throttling the thing up, I got up to about 15 or 20 percent, and I started chugging. You could actually feel the rough combustion of the - behind the spacecraft. I held the throttle there, and, I might add, I throttled up quite slowly. I held the throttle there, waited for it to catch up; it did, and I throttled on up to 40 percent, and it followed itself going up.

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Tape 09-03601

03 21 50 40 LMP And you want to pitch now and - -  
03 21 50 42 CDR Yes.  
03 21 50 43 LMP Okay.  
03 21 50 44 CDR Are we in 76 now?  
03 21 50 45 LMP Yes, I'm going to - Here.  
03 21 50 47 CDR Here, very good.  
03 21 50 52 CDR See how bad off we are; we're pretty bad. The  
shutdown was good. The residuals were practically  
zero, and Gumdrop is way down below us. There.  
See him?

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Tape 09-03601

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03 21 51 07 LMP	Yes. See him?
03 21 51 10 CDR	Yes.
03 21 51 12 CDR	Hey, I'm surprised we didn't break LOCK.
03 21 51 15 CDR	He's practically underneath us. Hey, we really got to pitch pretty fast on that.
03 21 51 20 CDR	Yes.
03 21 51 21 LMP	I wonder what it looks like from over there?
03 21 51 26 CMP	Your broadcast begins.
03 21 51 29 LMP	Thank you. Hey, keep after us, will you, Davie.
03 21 51 32 CMP	Okay.
03 21 51 36 CDR	Boy, are you down below us.
03 21 51 48 CDR	Let me make sure I still have him, Rusty. I'm not -
03 21 51 50 LMP	Yes, right.
03 21 51 53 CDR	No sweat, ... 28 000 feet, it's 6 miles, 2.7 ... and we got a good radar.
03 21 52 04 LMP	Quiet.
03 21 52 05 CDR	Yes.
03 21 52 23 CDR	Hey, are we still locked down in the pitch part -
03 21 52 44 CDR	Okay, we're pit - locked on in yaw, too.
03 21 52 46 LMP	Okay, it's good, huh?
03 21 52 48 CDR	Yes, good. Okay ...
03 21 52 52 CDR	Ready for IGC?

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Day 4 - Page 185  
Tape 09-03601

03 21 52 54 LMP Oh, yes, LGC. Okay, watch this thing.

03 21 53 03 CDR Okay.

03 21 53 08 LMP Okay, I know what that was. That was, that thing was not on LGC. I didn't read the LGC first to you.

03 21 53 15 CDR Yes.

03 21 53 17 LMP 5.15 - let me just verify it.

03 21 53 29 CDR That's a verify.

03 21 53 32 CDR Boy, that old petrol's really gone down.

03 21 53 45 LMP Okay, now it goes - Okay. Okay, 5.25; 3 degree alarm.

03 21 53 54 CDR Yes.

03 21 53 55 LMP No sweat. 3.27.

03 21 54 03 CDR Okay, let's take it.

03 21 54 05 LMP Okay.

03 21 54 15 CDR Gee, there's some funny rates there.

03 21 54 36 LMP Hmm! What's that? Well, I thought I could get into the - Let me get the TPI zero time here going. Okay, it's 94:57.

03 21 54 59 CDR Is the tape off?

03 21 55 02 LMP Tape coming ...

03 22 26 00 LMP Recorder on. And I'll tell you what; why don't you pitch up just a tad, and I'll get another mark here.

03 22 26 05 CDR It is coming right on down now.

03 22 26 06 LMP Okay.

03 22 26 08 CDR Hello, tape recorder. This is the old CDR here. I've got a couple of comments about the spacecraft.

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The COAS has to be made brighter; it's just absolutely unusable the way it is now. I - I really have great skepticism about whether I'm even going to be able to dock this afternoon with it or not. I think that we really got to work to get something better than that. Also, I think that the restraints here pull you toward the front of the spacecraft too much, and you're continually pushing back. I think we could sure fix those up a little bit, although that - they are not nearly as aggravating as the COAS. The window shades are in the way all the time. And when I did the - when I use the AOT, I find that the - the reticle and the stars don't seem to be focused at the same place. Come on radar, don't screw up. Another red light flashing a little bit.

03 22 27 12 LMP

Ohhh.

03 22 27 16 LMP

Okay, 49 miles, ... - -

03 22 27 17 CDR

Okay, I guess those - those are the only comments I have right now. Oh, the spacecraft seems to be very ungainly when you're translating left to right, fore and aft, with the descent stage on it. MODE CONTROL, using PULSE, either PGNS or AGS, is very nice. We have awfully fine control, very good. The rate needles are absolutely atrocious. It's almost like flying without rate needles, and they ought to be - I'm sure that you could probably put a new set of rate needles in there for 0.1 of what it costs in fuel to oscillate back and forth. I think that's all I have for right now.

03 22 27 59 LMP

Hey, by the way, I can still see in the daytime here.

03 22 28 01 CDR

Can you really?

03 22 28 02 LMP

Yes.

03 22 28 04 CDR

Let's see, he should be right out there in front of us, shouldn't he? Let me find him again.

03 22 28 06 CDR

Hey, so can I. again.

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Tape 09-03601

03 22 28 07 LMP Yes, he's like a star out there.

03 22 28 09 CDR Yes.

03 22 28 10 LMP Okay, and what's the range now? It's 49 miles, now.

03 22 28 13 CDR 49 miles.

03 22 28 15 LMP Okay, so that's pretty good.

03 22 28 16 CDR Yes. Hey, Dave, we're at 49 miles and we - -

03 22 49 40 LMP Okay, the tape is ON, and Gumdrops, we're turning off our tracking light.

03 22 49 49 CMP Okay.

03 22 49 51 LMP Okay, you got the AOT lamp closed; okay, VERB 37, ENTER; 52 - Oh, you've got to turn it up brighter than that, Jim - ENTER; VERB 22, ENTER; 3, ENTER; PRO; ENTER; VERB 21, ENTER; 215, ENTER; PRO.

03 22 50 15 CDR Ready, go.

03 22 50 16 LMP Go.

03 22 50 25 CDR Could you get that light up over my head off there, Rusty?

03 22 50 27 LMP Yes, I'm going to turn that off, then I'm going to turn that off. Then I'm going to turn that off. How's that?

03 22 50 39 CDR That's okay.

03 22 50 42 CDR Here he comes.

03 22 50 53 LMP 3, 2, 1 -

03 22 50 55 LMP MARK.

03 22 50 56 LMP Great Gaidrey. (Laughter) Okay. Ready?

03 22 51 01 CDR Okay, I'm ready.

03 22 51 02 LMP Stand by. Okay. You are clear to mark either.

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Tape 09-03601

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03 22 51 08	CDR	Okay. Give me one to the RIGHT.
03 22 51 09	LMP	One RIGHT.
03 22 51 10	CDR	Stop the UP/DOWN motion.
03 22 51 22	CDR	One more to the RIGHT.
03 22 51 23	LMP	One more RIGHT.
03 22 51 32	LMP	CLEAR to mark X.
03 22 51 35	CDR	Okay. Give me about one DOWN and one LEFT. One UP.
03 22 51 45	LMP	CLEAR to mark X.
03 22 51 46	CDR	Oh, shoot. Give me one to the RIGHT and one UP.
03 22 51 55	LMP	Another UP?
03 22 51 58	CDR	No, it's - yes, one UP.
03 22 52 00	LMP	Okay.
03 22 52 12	CDR	Okay. Now give me one UP.
03 22 52 14	LMP	One UP?
03 22 52 15	CDR	One DOWN, one DOWN.
03 22 52 16	LMP	One DOWN. Can we stop the LEFT/RIGHT?
03 22 52 19	CDR	Yes, stop the LEFT/RIGHT.
03 22 52 38	LMP	CLEAR to mark either. Excuse me. I didn't see you mark that. Call that a mark, will you?
03 22 52 43	CDR	X.
03 22 52 44	LMP	Okay, turn to mark Y.
03 22 52 45	CDR	Okay, give me about one UP.
03 22 52 47	LMP	One UP.

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Tape 09-03601

03 22 52 49 CDR One to the LEFT.  
03 22 52 50 LMP One to the LEFT.  
03 22 52 56 CDR Okay. One to the RIGHT.  
03 22 52 57 LMP One to the RIGHT.  
03 22 53 04 LMP Okay. CLEAR to mark either.  
03 22 53 07 CDR Okay. One to the RIGHT.  
03 22 53 10 LMP One to the RIGHT.  
03 22 53 18 LMP Stop the UP/DOWN?  
03 22 53 19 CDR Yes. Stop the UP/DOWN.  
03 22 53 32 CDR Oh! Come on. Okay. One to the RIGHT.  
03 22 53 41 LMP CLEAR to mark X.  
03 22 53 42 CDR Okay. One DOWN.  
03 22 53 45 LMP Okay.  
03 22 53 56 LMP CLEAR to mark either.  
03 22 53 57 CDR Okay. One UP.  
03 22 53 58 LMP One UP.  
03 22 54 01 CDR Stop the LEFT/RIGHT.  
03 22 54 02 LMP Okay.  
03 22 54 06 CDR One more UP.  
03 22 54 07 LMP One more UP.  
03 22 54 19 LMP Damn! Boy, this won't go UP.  
03 22 54 22 CDR That's alright, it's coming.  
03 22 54 29 LMP Okay. CLEAR to mark Y.  
03 22 54 30 CDR Okay. One to the RIGHT - LEFT and one UP.

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Tape 09-03601

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03 22 54 51	CDR	One more to the LEFT.
03 22 54 59	LMP	CLEAR to mark either.
03 22 55 00	CDR	Okay. One to the RIGHT.
03 22 55 06	CDR	One more to the RIGHT.
03 22 55 16	LMP	Do the radar antennas seem to stay out of the way?
03 22 55 19	CDR	Yes!
03 22 55 20	LMP	You're CLEAR to mark either, by the way.
03 22 55 21	CDR	Yes. One more to the RIGHT.
03 22 55 23	LMP	Okay.
03 22 55 31	LMP	CLEAR to mark X.
03 22 55 34	CDR	Okay. One DOWN.
03 22 55 35	LMP	One DOWN.
03 22 55 45	LMP	Okay. That's it - -
03 22 55 46	CDR	- - Okay.
03 22 55 49	LMP	Go.
03 22 55 52	LMP	225! By God, that's the right one! No shit, it's Acrux. Ready to maneuver?
03 22 55 59	CDR	Go.
03 22 56 00	LMP	Here you go.
03 22 56 02	CDR	Gracious, sakes alive. You, we're going the same way we went last time.
03 22 56 10	LMP	Isn't that amazing?
03 22 56 30	CDR	Here he comes. 3, 2, 1 -
03 22 56 37	LMP	MARK.
03 22 56 39	CDR	Hang on.

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Tape 09-03601

03 22 56 41 LMP Yes, let it damp a little bit because we - -  
03 22 56 42 CMP - - Coming up through about 20 ...  
03 22 56 47 CC - - That's no problem. It's a 7-minute pass, and  
we'll have Honeysuckle shortly thereafter.  
03 22 56 51 CDR Okay, go. Give me about two UP, three UP, maybe.  
03 22 57 02 LMP Three UP, you've got them.  
03 22 57 04 CDR Right.  
03 22 57 07 CDR And, one to the RIGHT - -  
03 22 57 08 LMP - - And Houston, Spider, I am reading you. We are  
in the middle of our alignment..  
03 22 57 11 CDR One to the RIGHT.  
03 22 57 12 LMP Okay.  
03 22 57 13 CDR Couple more UP.  
03 22 57 14 CC Spider, copy.  
03 22 57 19 CMP ... this is the Gumdrop, Stu.  
03 22 57 23 CC Roger. I would like to hold it, Gumdrop; Spider  
is in the middle of their alignment.  
03 22 57 26 CMP Roger, I'll wait for them; be ready whenever they  
are.  
03 22 57 29 CC Okay.  
03 22 57 34 CMP Stu, I'd like ...  
03 22 57 36 CDR How about some more RIGHT?  
03 22 57 37 CDR MARK.  
03 22 57 38 CC Oh, you cut me off by a few seconds. That was my  
next question; go.  
03 22 57 42 CDR Okay, one - one more UP.

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Tape 09-03601

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03 22 57 43 CMP ... plus 000 ...

03 22 57 44 LMP How about one RIGHT.

03 22 57 48 CMP - - ... 000, plus 00083, plus 00008, minus 00 ...

03 22 57 54 CDR Okay. One to the RIGHT.

03 22 57 55 LMP Okay.

03 22 57 56 LMP MARK Y.

03 22 57 59 CC Roger, Gumdrop. Houston copies.

03 22 58 04 LMP Want another?

03 22 58 06 CDR No; you can stop the UP/DOWN though.

03 22 58 07 LMP One DOWN.

03 22 58 08 CDR That's good.

03 22 58 30 LMP ... it's going to be faster if we do two, and then take one out.

03 22 58 34 CDR Oh, Hell!

03 22 58 36 LMP What is the matter?

03 22 58 37 CDR I marked an X when I should have marked a Y.

03 22 58 38 LMP Give me - Wait a minute, now. We've got a program alarm. Okay. You are CLEAR to mark either now.

03 22 58 46 LMP Oh, shoot! Okay, I screwed the whole thing up, didn't I?

03 22 58 49 CDR Yes. Okay, give me one UP.

03 22 58 51 LMP One UP.

03 22 58 53 CDR Stop the LEFT/RIGHT.

03 22 58 54 LMP Okay, it is stopped.

03 22 58 55 CDR Okay, give me about one LEFT.

03 22 58 57 LMP One LEFT.

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Tape 09-03601

03 22 59 00 CDR Did you give me two; that was probably alright.

03 22 59 02 LMP No, I gave you one ROLL. I'm rolling when I think you are not marking, but keep that at zero.

03 22 59 08 LMP Okay. CLEAR to mark Y. CLEAR to mark either.

03 22 59 22 CDR Okay.

03 22 59 23 CDR Give me one RIGHT.

03 22 59 24 LMP One RIGHT.

03 22 59 40 LMP CLEAR to mark X.

03 22 59 42 CDR Okay.

03 22 59 43 LMP Just let her drift, right?

03 22 59 44 CDR Just let her drift, that's right.

03 22 59 45 LMP Okay.

03 22 59 53 CDR One up. And one RIGHT, too.

03 22 59 56 LMP Left, I've got it.

03 22 59 57 CDR Well, I wanted it RIGHT, but that - -

03 22 59 59 LMP - - You wanted it RIGHT?

03 23 00 00 CDR Stand by, just leave it - I don't want it where it is right now. Just let - let it go and let me see where it is going.

03 23 00 04 LMP Okay.

03 23 00 06 CDR One LEFT or RIGHT. Never mind, just leave it go. Okay. One UP.

03 23 00 10 LMP One UP. CLEAR to mark either.

03 23 00 13 CDR Okay.

03 23 00 16 LMP Okay, CLEAR to mark Y.

03 23 00 19 CDR Okay, one - Just a minute. One RIGHT.

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03 23 00 33 LMP CLEAR to mark either.

03 23 00 35 CDR Okay, one DOWN. That's good. What pair; this is only the third pair.

03 23 00 45 LMP Oh, no, no. It's the fifth pair.

03 23 00 47 CDR Let's see, is it? Okay. We lost that one.

03 23 00 52 LMP Yes, I - I know.

03 23 00 55 CDR Okay - -

03 23 00 56 LMP CLEAR to mark Y.

03 23 00 57 CDR - - two DOWN and one LEFT.

03 23 00 59 LMP Two DOWN and one LEFT! Okay.

03 23 01 03 CDR Okay. Stop the UP/DOWN and another one LEFT.

03 23 01 14 LMP You got the mark.

03 23 01 15 CDR Yes. Just a - just a second.

03 23 01 18 LMP Okay.

03 23 01 19 CDR This is a LEFT mark.

03 23 01 23 LMP A Y mark.

03 23 01 24 CDR A Y mark! (Laughter) Okay, there we are.

03 23 01 26 LMP Okay.

03 23 01 29 LMP Oh boy, terrible.

03 23 01 30 CDR Screwed up. Screwed it up!

03 23 01 40 LMP Okay, torquing angle - Did you get - We're going to do a third star check on this -

03 23 01 43 CDR Right.

03 23 01 44 LMP Plus 00089, plus 00055, plus 00037.

03 23 01 54 CC And Spider, this is Houston. I copied the angles.

03 23 02 00 LMP Roger - Roger.

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Tape 09-03601

03 23 02 10 CC Sounds like things are going well - -

03 23 02 11 LMP Ready.

03 23 02 12 CC - - You might bring up your S-band volume. We will be going over to Honeysuckle in about 2 minutes.

03 23 02 21 CMP Gumbrop.

03 23 02 22 LMP Roger, Spider.

03 23 02 24 CDR Make sure we don't get in gimbal lock there.

03 23 02 49 CDR Here he comes. Bang, right there.

03 23 02 55 LMP Stand by; I'm - I'll zero it for you. It's zero right now. ... close. Wait a minute; stand by. Boy! You know, you get some slosh in there - Okay, now it is coming back in.. It is a little to the RIGHT in yaw.

03 23 03 25 CDR Yes.

03 23 03 26 LMP Okay, and about one UP also. Okay, it's crossing right now.

03 23 03 32 CDR That's good!

03 23 03 33 LMP Okay. PRO, PRO, VERB 34, ENTER, the CB(11) AO BUS, OPEN, the lamp, OPEN, and a tape coming off and the time is 95:03:55.

03 23 03 55 LMP MARK.

03 23 33 12 SC - - The tape is on OFF. Okay, CB(11) EPS INVERTER 1, CLOSE.

03 23 33 22 CDR INVERTER 1 coming CLOSE; it's CLOSED.

03 23 33 23 CMP Okay, stand by. Going to INVERTER 1. Okay, that's good. CROSS TIE BALANCE LOADS coming OPEN. And, heck, your BUS didn't even drop at all that time.

03 23 33 36 CDR Okay.

03 23 33 37 LMP Descent BATS are taking some of the load now.

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Tape 09-03601

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03 23 33 39 CDR Yes.

03 23 33 41 LMP Okay. Standing by for 4 minutes.

03 23 33 47 CDR Okay.

03 23 33 49 CDR Let me - let's check the ascent  $O_2$  and  $H_2 - O_2$   
and  $H_2O$ . Good rates. Okay.

03 23 34 33 LMP Oh! Got a long pad up there. Remind me that  
that's a 4-minute bias. I want to wri -

03 23 34 43 CDR Oh, boy.

03 23 34 44 LMP I want to write it on there - -

03 23 34 45 CDR Yes.

03 23 34 46 LMP - - as soon as I - -

03 23 34 47 CDR Oh, yes.

03 23 34 48 LMP - - get out of here. Oh, my back.

03 23 35 00 CDR Okay, let's start the 4-minute check.

03 23 35 02 LMP TTCA, THROTTLE UP, then MIN THROTTLE.

03 23 35 05 CDR THROTTLE UP; THROTTLE MIN.

03 23 35 08 LMP Okay, THRUST CONTROL, MANUAL.

03 23 35 10 CDR THRUST CONTROL, MANUAL.

03 23 35 12 LMP MANUAL THROTTLE to Commander.

03 23 35 13 CDR MANUAL THROTTLE to Commander.

03 23 35 15 LMP Verify MODE CONTROL, AUTO.

03 23 35 16 CDR MODE CONTROL is AUTO.

03 23 35 18 LMP ENGINE ARM to DESCENT.

03 23 35 19 CDR ENGINE ARM to DESCENT.

03 23 35 23 LMP X-TRANSLATION to 2 JETS.

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Tape 09-03601

03 23 35 25 CDR 2 JETS.

03 23 35 26 LMP BALANCE COUPLES are ON.

03 23 35 27 CDR BALANCE COUPLES are ON.

03 23 35 29 LMP Verify DPS and RCS temperatures and pressures.  
Okay, do we have a Delta-T greater than - or a  
Delta-P greater than A? ... 15.

03 23 35 36 LMP/CDR Oh.

03 23 35 37 LMP About 15; we're still about the same, then -

03 23 35 40 CC ... logged your data. Standing by.

03 23 35 45 LMP Spider.

03 23 35 47 CMP Gumdrop.

03 23 35 48 LMP Okay, standing by for 2 minutes.

03 23 35 59 CDR Hope we're pointing in the right direction. How  
about that? Gumdrop, on my mark it will be 3  
minutes.

03 23 36 05 CMP Okay.

03 23 36 08 LMP MARK.

03 23 36 09 CMP Right with you.

03 23 36 10 CDR Okay.

03 23 36 47 LMP That thing isn't even firing a PULSE! There it goes.

03 23 36 49 CDR (Laughter) Yes, that's what it did as soon as I  
said it wasn't, too.

03 23 37 01 LMP It's not going to be that way on the ascent stage!

03 23 37 04 CDR I'm afraid you are right.

03 23 37 08 LMP Okay, 2 minutes. DFI POWER, ON.

03 23 37 10 CDR DFI POWER, ON.

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Tape 09-03601

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03 23 37 12 LMP Okay, verify the burn attitude.

03 23 37 17 LMP Okay. That looks good.

03 23 37 20 CDR Yes. Looks great.

03 23 37 21 LMP 7 degrees; okay that's just about right. Okay.

03 23 37 30 CDR Okay, at 9 seconds we are - -

03 23 37 32 LMP - - We have PGNCS and AGS attitude errors?

03 23 37 33 CDR Yes, we did that.

03 23 37 34 LMP We're at 10<sup>4</sup> degrees; that's just right.

03 23 37 38 CDR At 9 seconds you are going to begin ullage?

03 23 37 40 LMP Right.

03 23 37 41 CDR In 5 seconds you are going to press the engine ON?

03 23 37 44 LMP Right.

03 23 37 45 CDR Highly efficient burn. How long is it suppose to be? 43 ft/sec, huh?

03 23 37 50 LMP Right.

03 23 37 51 CDR Okay. Our engine OFF. I am going to turn the engine OFF. ENGINE ARM OFF, I mean. Come ON with JETS. You'll PRO at the residuals and burn out the residuals.

03 23 38 02 LMP Right.

03 23 38 05 LMP 1 minute.

03 23 38 08 LMP MARK.

03 23 38 09 CMP Roger. Right with you and all ready to go ...

03 23 38 12 CDR Okay.

03 23 38 38 LMP Okay, AVERAGE g's ON. CLEAR, 500 read. Okay. 20 seconds. Begin the ullage at 9.

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Tape 09-03601

03 23 38 53 CDR Ullage at 9.

03 23 38 55 LMP This is going to a lot nicer ullage.

03 23 38 57 CDR I hope so.

03 23 39 00 LMP Okay. Ullage ON. PRO. Okay, go, baby. Descent quantity?

03 23 39 10 CDR Okay.

03 23 39 11 LMP Don't sweat that one.

03 23 39 15 CDR Okay, then we're okay.

03 23 39 16 LMP Burning. They are both counting down together.

03 23 39 22 LMP Boy, it doesn't trim worth a hoot in hell, does it?

03 23 39 24 CDR No!

03 23 39 28 LMP Okay, 2, 1 -

03 23 39 29 LMP ENGINE CUTOFF.

03 23 39 30 LMP Okay, get the ENGINE ARM OFF.

03 23 39 33 CDR Shutdown.

03 23 39 36 CDR It's a good burn, Dave.

03 23 39 38 CMP Oh, very good. Thank you.

03 23 39 39 LMP Okay, here's the residuals: minus 0.9, minus 0.2, and minus 0.3.

03 23 40 04 CDR Okay. That looks good.

03 23 40 08 LMP Aw, come on.

03 23 40 09 CDR That's good, Rusty.

03 23 40 10 LMP Okay.

03 23 40 13 CDR Okay, stand by here. Okay. R&D TELEMETRY, CAL; and DFI power, OFF; and I'll get the VERB 79,

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Tape 09-03601

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ENTER. Houston, I'll give you a R&D TELEMETRY CAL now, and you can call me on the DFI POWER when you want it.

03 23 40 28 CC Roger, Spider. We'll do that. And, we copied your burn; looked great. And saw you coming through ...

03 23 40 35 CDR Roger. Going to CAL now. Okay. You got it in POO? Let's get the POO.

03 23 40 43 LMP Yes. The landing radar breaker, OPEN. Alright -

03 23 40 49 CDR That was power just to landing radar breaker?

03 23 40 51 CMP ... stand by, Houston.

03 23 40 58 CDR What's it doing all the thinking about? Did you punch up POO in -

03 23 41 02 LMP Yes, it's going into POO.

03 23 41 03 CDR Why this flashing 37?

03 23 41 09 LMP Because I had to KEY RELEASE.

03 23 41 10 CDR Okay.

03 23 41 12 LMP Okay. THROTTLE CONTROL to AUTO.

03 23 41 14 CDR THROTTLE CONTROL, AUTO.

03 23 41 16 LMP PRPLNT QUANTITY MONITOR, OFF.

03 23 41 17 CDR PRPLNT QUANTITY MONITOR, OFF.

03 23 41 18 LMP Okay, I am going back to INVERTER 2.

03 23 41 20 CDR Okay.

03 23 41 22 LMP Okay, INVERTER 2 works. INVERTER 1, OPEN.

03 23 41 25 CDR CAL is OFF.

03 23 41 26 LMP INVERTER 1, OPEN.

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03 23 41 27 CC Roger, copy; CAL is OFF.

03 23 41 29 LMP BALANCE LOADS, CLOSED.

03 23 41 30 CDR What?

03 23 41 31 LMP I got the CROSS TIE BALANCE LOADS, CLOSED.

03 23 41 34 CDR Okay, PREP for the CSI pad, and don't forget to get that - -

03 23 41 32 LMP Okay, while we are doing that, let me get the VERB 95, ENTER; VERB 37, ENTER; 20, ENTER.

03 23 41 50 CDR Okay, and we're ready to - POO, come on, baby.

03 23 41 52 LMP Okay, ready to error-monitor RENDEZVOUS RADAR?

03 23 41 55 CDR RENDEZVOUS RADAR.

03 23 41 57 LMP Okay, we start the AUTO maneuver and debrief the burn. Or, you can start the AUTO maneuver while you debrief the burn?

03 23 42 04 CDR Okay, we are going to maneuver. Didn't go in.

03 23 42 08 LMP You didn't wait long enough.

03 23 42 10 CDR Yes. At 61 we should pitch up a little bit. Just about right. Okay, tape, that burn was smooth start.

03 23 42 17 CC Gumdrop, Houston. We're still showing all entry batteries on the line.

03 23 42 21 LMP Roger. Haven't gotten to it yet. Thank you.

03 23 42 23 CDR Rather erratic steering in pitch, yaw, and roll. Did the residuals out very well. It had some pretty good size errors as it ran along through the - through the burn; but it looked like it got where it wanted to go.

03 23 42 41 LMP Yes, there was a good bit of jet firing - -

03 23 42 43 CDR Yes.

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03 23 42 44 LMP - - on the thing.

03 23 42 45 CDR Smooth shutdown and no adverse comments about it.

03 23 42 49 LMP Okay, we got the VERB 95 in.

03 23 42 51 CDR Yes.

03 23 42 52 CC That was pretty good.

03 23 42 53 CDR Don't forget that 4 - don't forget that 4-minute bias thing, now.

03 23 42 54 CC ...

03 23 42 55 LMP Yes, do that right now.

03 23 42 59 CC ... Roger, I didn't know I was rushing you, Dave. I just wanted to remind you.

03 23 43 02 CMP Okay, I like those reminders.

03 23 43 05 CC Roger.

03 23 43 07 CDR Okay, how does that look?

03 23 43 08 LMP Well, we are locked on. Let me see if I can see him out there. Let me zero the needles.

03 23 43 24 CDR Never see him.

03 23 43 26 LMP How's the signal strength?

03 23 43 29 CDR Well, it's at 2.5 and that's pretty good. That says we should be 25 miles, and we're at least that far out. Let me -

03 23 43 40 LMP Okay, by the way, Mr. Tape, for your information - -

03 23 43 43 CC Gumdrop, Houston. At your convenience, if you want to, before you start your marks here, just turn on the fan in H<sub>2</sub> tank 2.

03 23 43 44 CDR ...

03 23 43 45 LMP Okay. VERB 80.

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Tape 09-03601

03 23 43 46	CDR	Let's accept him. VERB 80.
03 23 43 51	LMP	For your information, tape, we can't hear the burn at all. I never have been able to hear the engine burn, have you, Jim?
03 23 43 58	CDR	What?
03 23 43 59	LMP	The engine?
03 23 44 00	CDR	As a matter of fact, that is right. No.
03 23 44 01	LMP	No, not a bit of noise.
03 23 44 03	CDR	It's no - no audio problem at all. That's worth - quite well worth mentioning.
03 23 44 08	LMP	Yes. Absolutely no noise. Okay, tape, you are going to go OFF, and the time is 95:44:15. 2, 1 -
03 23 44 16	LMP	MARK.
03 23 44 17	LMP	Tape OFF.

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Tape 09-03601

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DAY 5

04 00 06 09	LMP	Tape ON.
04 00 06 10	CDR	Okay. We'll PROCEED out of there.
04 00 06 14	LMP	Okay. 82 minus 38.0, zips and minus 24.5.
04 00 06 17	CDR	Okay. Go.
04 00 06 24	LMP	Go.
04 00 06 26	CDR	Okay, 9:39. The clock is about right.
04 00 06 28	LMP	Okay, I missed the 10-minute mark. Let me try to get that. 1, 27. Okay, can you carry on there, please?
04 00 06 35	CDR	Yes. Okay, I don't think we need to mess with that; we are going to burn this one here anyway, here so, if - if it agrees with the ground, why don't we just skip the charts?
04 00 06 41	LMP	Okay, I'll just copy down the number, here.
04 00 06 42	CDR	Yes.
04 00 06 43	LMP	The range was 62.5.
04 00 06 46	CDR	...
04 00 06 49	CDR	Gumdrop? Gumdrop, Spider here. Our solution is 400. At the same time, we are going to burn our solution.
04 00 07 01	CMP	Okay, I copy your solution is 40.0 at the same time.
04 00 07 06	CDR	That's affirmative. Okay, kid. We're up to RANGE and RANGE RATE. We got to go to POO.
04 00 07 11	LMP	POO update going in the AGS.
04 00 07 18	CDR	Ready?
04 00 07 20	LMP	Go.

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Tape 09-03601

04 00 07 22 CDR Well ... you're faster than I thought you were.  
Go.

04 00 07 26 LMP Okay, and the next thing you want to do is set the  
DAP.

04 00 07 29 CDR Right.

04 00 07 30 LMP Let's start some of this reconfiguring over here.

04 00 07 32 CDR Okay.

04 00 07 33 LMP SUIT ... LIVERTER, PULL/EGRESS.

04 00 07 35 CDR PULL/EGRESS.

04 00 07 36 CDR CABIN REPRESS, CLOSE.

04 00 07 38 LMP Okay. I am going to put my gloves on. Hold on.

04 00 07 41 CDR Okay.

04 00 07 47 LMP Come on, you son of a bitch.

04 00 07 52 CDR ... how to get this down, now. I don't know why,  
I can't see anything in here.

04 00 08 02 CDR Okay, PRO out of there. VERB 48, ENTER; VERB 21,  
ENTER. Then I want 02002, ENTER. PRO. VERB 34,  
ENTER. Okay, we have the DAP set up, and we line  
updated the AGS?

04 00 08 30 LMP Oh, yes. Yes.

04 00 08 32 CDR 37, ENTER; 41, ENTER.

04 00 08 36 LMP Okay, SUIT - CABIN GAS going to CLOSE. Watch out.

04 00 08 40 CDR Okay.

04 00 08 41 LMP Okay, what's next?

04 00 08 42 CDR Read ERROR MONITOR; LANDING RADAR COMPUTER. I am  
going to go ahead and make the maneuver, Rusty.

04 00 08 46 LMP Okay, go ahead.

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Tape 09-03601

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04 00 08 47 CDR AUTO maneuver -

04 00 08 48 LMP And you can call the NOUN 86 while you are there;  
PRO.

04 00 08 56 CDR Okay. NOUN 86, ENTER.

04 00 09 00 LMP ... leave it up there, or not? Okay, minus 40.  
Okay, 451 is all zeros. Okay, and 452 is minus 1.

04 00 09 27 CC ...

04 00 09 33 CDR You get those numbers?

04 00 09 34 LMP Yes.

04 00 09 35 CDR Alright.

04 00 09 51 CDR Okay, AUTO MANEUVER, NOUN 86; we've done that.  
We're loading the DAP - the AGS.

04 00 09 56 LMP I'm doing that.

04 00 09 58 CDR Okay.

04 00 09 59 LMP Okay, I've got -

04 00 10 02 CDR PRO out of there. Anyway, it's 1685.

04 00 10 14 CDR Okay.

04 00 10 17 LMP Okay, I'm all done.

04 00 10 18 CDR Okay, did you get the suit gas converter?

04 00 10 20 LMP Yes, I did.

04 00 10 21 CDR PULL/EGRESS? CABIN REPRESS, CLOSE?

04 00 10 27 LMP EGRESS, CLOSE.

04 00 10 28 CDR DESCENT O<sub>2</sub>, CLOSE?

04 00 10 29 LMP Wait a minute now. CABIN REPRESS, CLOSE. Right.  
I've got it now. - -

04 00 10 32 CDR - - DESCENT - -

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Tape 09-03601

04 00 10 33 LMP - - gas converter and the CABIN REPRESS.  
04 00 10 35 CDR Okay. DESCENT O<sub>2</sub>, CLOSE.  
04 00 10 36 LMP DESCENT O<sub>2</sub>, CLOSE.  
04 00 10 38 CDR ASCENT number 1 O<sub>2</sub>, OPEN.  
04 00 10 39 LMP ASCENT number 1, OPEN.  
04 00 10 40 CDR THRUST REG's A and B to EGRESS.  
04 00 10 41 LMP REG's A and B gone to EGRESS.  
04 00 10 43 CDR H<sub>2</sub> TANK SELECT to ASCENT.  
04 00 10 45 LMP H<sub>2</sub> TANK SELECT going to ASCENT.  
04 00 10 47 CDR ASCENT H<sub>2</sub>O tank, OPEN.  
04 00 10 54 LMP ASCENT H<sub>2</sub>O, OPEN.  
04 00 10 55 CDR DESCENT H<sub>2</sub>O, CLOSE.  
04 00 10 57 LMP DESCENT H<sub>2</sub>O, CLOSE.  
04 00 10 58 CDR Verify that ED BATS are greater than 35 volts.  
04 00 11 02 LMP Okay. Stand by. Get the side panels on here.  
ED BATS are greater than 35.  
04 00 11 10 CDR Check the ASCENT BATS and BUS voltages.  
04 00 11 14 LMP ASCENT BATS look good; the BUS voltages are 29  
and 29.  
04 00 11 21 CDR Okay, DESCENT BATS, deadface; talkbacks, barber  
pole.  
04 00 11 24 LMP Okay, deadface; barber pole.  
04 00 11 28 CDR Okay, 6 minutes. We're a minute 30 seconds late.  
CB(11), AC BUS A - -  
04 00 11 31 LMP I'll read them to you? DECA GIMBAL, OPEN.  
04 00 11 34 CDR DECA GIMBAL, OPEN.

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04 00 11 35 LMP FLIGHT DISPLAYS, THRUST, OPEN.  
04 00 11 37 CDR FLIGHT DISPLAYS, THRUST, OPEN.  
04 00 11 39 LMP DESCENT HELIUM REG VENT, OPEN.  
04 00 11 42 CDR DESCENT HELIUM REG VENT, OPEN.  
04 00 11 43 LMP HEATER, LANDING RADAR, OPEN.  
04 00 11 45 CDR LANDING RADAR, OPEN.  
04 00 11 46 LMP STAB/CONTROL DECA POWER, OPEN.  
04 00 11 47 CDR STAB/CONTROL DECA POWER, OPEN.  
04 00 11 48 CC ARIA 5, Houston CAP COMM. Go REMOTE.  
04 00 11 51 LMP PGNS, LANDING RADAR, OPEN.  
04 00 11 53 CDR PGNS, LANDING RADAR, OPEN.  
04 00 11 55 LMP CB(16), EPS, CROSS TIE BALANCE LOADS going OPEN,  
and I'm going to watch your bus voltage. Okay,  
it's holding in there good.  
04 00 12 02 CDR Okay.  
04 00 12 04 LMP Okay, where are we now?  
04 00 12 05 CDR RCS and APS temperatures and pressures.  
04 00 12 07 LMP Okay, and we're at the 4-minute check and we're  
right on time there. Go ahead and read that one.  
04 00 12 12 CDR ASCENT is 68, 68; 180 and 180. Looks good.  
04 00 12 18 LMP Okay, TTCA, JETS, DOWN.  
04 00 12 21 CDR TTCA, JETS, DOWN.  
04 00 12 22 LMP Okay, MASTER ARM, ON.  
04 00 12 27 CDR Okay.  
04 00 12 28 LMP Stand by here.

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Tape 09-03601

04 00 12 30 CDR MASTER ARM, ON. I've got two yellow lights. How about that!

04 00 12 33 LMP Great! Verify burn attitude.

04 00 12 37 CDR Okay. We're coming up on it. 3 minutes to go. Okay, Gumdrops, we're about 3:15 now.

04 00 12 50 CMP Roger, ... with you and ready to support.

04 00 12 52 CDR Okay.

04 00 12 56 LMP Okay, I don't like that AGS. Yes, I guess it's alright. Yes, it's coming down. Okay, stand by for 2 minutes.

04 00 13 05 CDR Okay, Rusty, we're at 2 minutes. Verify the burn attitude ... to clear the PGNS. Okay, now what are we going to do. When we start burning, TTCA, COMMANDER, PLUS-X; then hit the stage fire ...

04 00 13 14 LMP I guess we're going to open the window shade, too.

04 00 13 17 CDR You want to check to make sure that your things are set up there.

04 00 13 20 LMP Yes.

04 00 13 21 CDR Okay, I am going to start the fire, then I'm going to stage. When I think everything's under control, I'm going to say ASCENT INTERCONNECTS.

04 00 13 31 LMP Okay.

04 00 13 32 CDR Then we're just going to press on like that. You're going to ASCENT the INTERCONNECTS and the main shut-off valves and all that stuff; get down to 9 feet per second, you're going to - to close them up again. Right?

04 00 13 43 LMP Right.

04 00 13 44 CDR Okay.

04 00 13 49 CDR Stand by for a thump on the feed, too.

04 00 13 52 LMP Yes, we're not going to be able to watch it ...

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Tape 09-03601

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04 00 13 54 CDR And as we repressurize or anything, I'm going to continue the PRESS right on with the burn.

04 00 13 57 LMP Right-o.

04 00 14 02 LMP Let me see how that's doing now. Okay, it's coming in. Good, there was 2 minutes. Okay.

04 00 14 31 CDR Okay, it's about a minute and 30 now, Gumdrop.

04 00 14 35 CMP ...

04 00 15 08 CDR Getting high, isn't it?

04 00 15 09 LMP No, it's not. It's doing good.

04 00 15 11 CDR Oh, wait a second. We're just going into darkness, aren't we?

04 00 15 13 LMP Yes.

04 00 15 15 CDR Okay.

04 00 15 22 CDR Hey, you ready?

04 00 15 24 LMP Okay, all set. Yes, I got to do them one at a time, here. AVERAGE-G's ON.

04 00 15 37 CDR Okay, start two little yellow lights.

04 00 16 04 LMP Okay, thrusting?

04 00 16 06 CDR Thrusting, staged. Okay, INTERCONNECT.

04 00 16 10 LMP Okay, coming OPEN.

04 00 16 15 CDR Foot staging. Everything looks good, here.

04 00 16 18 LMP Okay, I don't see anything out there. Would you call that out loud?

04 00 16 29 CDR 13 feet per second.

04 00 16 30 LMP Okay.

04 00 16 31 CDR 10, 8, ...

04 00 16 40 CMP ...

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Day 5 - Page 211  
Tape 09-03601

04 00 16 43 LMP Go ahead.

04 00 16 45 CMP ...

04 00 16 47 LMP We have a good burn. Do you read?

04 00 16 51 CMP ...

04 00 16 53 LMP Roger. We have a good burn. How do you read?

04 00 17 00 CDR Okay. The residuals are zero, Gumdrops. The residuals are zero. It was a good burn.

04 00 17 10 CMP ...

04 00 17 20 CDR ... It was a good burn, Gumdrops. It was a good burn.

04 00 17 24 CMP ...

04 00 17 28 CDR Okay. Burn time residuals were zero.

04 00 17 33 CDR Okay, ...

04 00 17 34 LMP Okay, CB(11), ED LOGIC POWER A, OPEN.

04 00 17 37 CDR ED LOGIC POWER A, OPEN.

04 00 17 38 LMP ED LOGIC POWER B, OPEN, over here.

04 00 17 40 CC ... This is Houston CAP COMM. Do you read?

04 00 17 44 CDR This is Spider, here; Houston. That was a good burn. We're staged.

04 00 17 47 CC Okay. Have you heard any transmission from the spacecraft?

04 00 17 51 CDR Say again?

04 00 17 54 LMP PRESS REG's A and B, to CABIN.

04 00 17 56 CDR Yes, go ahead. SUIT - next step is SUIT GAS DIVERTER, PUSH to CABIN.

04 00 18 02 LMP Got it.

04 00 18 05 CDR Okay.

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Tape 09-03601

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04 00 18 07 LMP Okay, now we got to hustle here.

04 00 18 09 CDR Yes.

04 00 18 10 LMP Okay, CSI; VERB 95, ENTER. I got it.

04 00 18 14 CDR Don't - don't forget to - put the bias in - -

04 00 18 18 LMP - - VERB 20, ENTER. Right, I will.

04 00 18 21 CDR Okay, go. I - I'll get it, and get over there.  
See where he is. Is your tape still on?

04 00 18 30 LMP Yes, it is. I'm going to take my gloves off.

04 00 18 32 CDR Okay, there was a pretty-good-sized thump at  
staging and a cloud of debris out front.

04 00 18 37 CMP Spider, Gumdrop; you say you've got a good burn  
and cleaned it up. Is that affirm?

04 00 18 40 CDR That's affirmative. A good burn - -

04 00 18 41 LMP There you go.

04 00 18 42 CDR And we cleaned it up.

04 00 18 44 CMP Gee, I can read you now. Thank you.

04 00 18 45 LMP Ready?

04 00 18 46 CDR Yes, go.

04 00 18 49 LMP Okay, now we got to do the NOUN 31, ENTER; 9656 - -

04 00 18 59 CC Tananarive M&O; Houston, CAP COMM. Go MANUAL key  
procedure. And, Spider - Spider, this is Houston.  
How do you read?

04 00 19 12 CDR Houston, I'm reading you broken. Be advised we  
had a good burn, and we're staged.

04 00 19 23 LMP Hey, it's 96 ... 6 - -

04 00 19 29 CDR He's going to be right in the moon.

04 00 19 31 LMP - - 9. 1 plus 45 is going to be - -

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Day 5 - Page 213  
Tape 09-03601

04 00 19 37 CMP Hot mike.

04 00 19 39 LMP Thank you. ... coming up. Came on. Houston, Spider. How do you read?

04 00 19 57 CDR A lot of - -

04 00 19 58 LMP Gumdrops, our CDH time is 96:58:14.

04 00 20 08 CMP 96:58:14.

04 00 20 10 LMP That's affirmative.

04 00 20 14 CDR We get a lot of signal strength, but he's right out there where I can't see him. The moon's there. Gumdrops, have you come back around where your light is pointing at us yet?

04 00 20 23 CMP Roger.

04 00 20 26 LMP ... heater. Okay, that's the one they warned us about.

04 00 20 29 CDR Okay, I don't see you out there, I guess.

04 00 20 32 CMP I haven't turned it up yet.

04 00 20 35 CDR Okay, let me - -

04 00 20 38 LMP ATT HOLD.

04 00 20 45 CDR That signal strength looks good, though. It's a little more responsive on the ascent stage, isn't it?

04 00 20 57 LMP Yes.

04 00 20 59 CDR I just can't see out there, Rusty. There's nothing out there but moon.

04 00 21 08 LMP Plus 000, line 6.

04 00 21 14 CDR 83 miles.

04 00 21 15 LMP Plus 00058, ENTER - -

04 00 21 20 CDR Let's - let's attempt it.

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Tape 09-03601

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04 00 21 21 LMP - - plus 01400, 965814, ENTER. PRO. You want to take it?

04 00 21 29 CDR Let's take it, yes.

04 00 21 30 LMP Okay, VERB 80, ENTER.

04 00 21 34 CDR We don't really have much choice. He's going to be out there - right by that moon - all the way in.

04 00 21 39 LMP Okay, we'll look at the first update and see what happens.

04 00 21 42 CC Tananarive M&O, Houston CAP COMM. I think somebody has an open mike.

04 00 21 49 LMP Houston, how do you read Spider? Houston, how do you read Spider? Hey, Gumdrop, if Houston reads you, would you pass them the T - the CDH time of 96:58:14?

04 00 22 07 CMP ...

04 00 22 41 LMP Gumdrop, do you read Spider on this antenna?

04 00 22 51 LMP Gumdrop, how about this antenna?

04 00 22 53 CMP Roger. I read you. You read me?

04 00 22 54 LMP Roger. Did you read the other call I just made?

04 00 22 58 CMP I heard both of them.

04 00 23 00 LMP Okay. Looks like I can only receive you on my number 2 antenna, here. Did you pass the CDH time to Houston?

04 00 23 07 CMP No, I haven't had any contact. Do you have your tracking light on?

04 00 23 11 LMP Yes, I do.

04 00 23 20 CMP And I guess you don't see me?

04 00 23 23 CDR No, I sure don't, Dave. You've got the moon behind you.

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Day 5 - Page 215  
Tape 09-03601

04 00 23 26 CMP No, I don't see you either.

04 00 23 32 LMP Gracious. Hope our tracking light didn't fail!

04 00 23 43 CDR It's not flashing.

04 00 23 45 LMP It's not?

04 00 23 46 CDR No. Let's check the breaker.

04 00 23 49 LMP Okay. Gumdrop, we no longer see the flash off our quad, but now that could have been reflection from the porch. So we - we can't really be sure.

04 00 24 08 CMP Okay, well, I don't see you.

04 00 24 10 CDR Roger.

04 00 24 20 CDR That's encouraging.

04 00 24 23 LMP Yes, isn't it?

04 00 24 42 LMP Okay, let me mush on here - -

04 00 24 44 CDR We're - we're going to really be scrambling for a ground solution for this mess.

04 00 24 49 LMP Yes, you're right. I better get a good chart, here.

04 00 25 12 LMP Okay, the tape is still on if you want to comment on that staging.

04 00 25 15 CDR Okay, the staging wasn't too bad. There were some attitude excursions, but not too much.

04 00 25 19 LMP Okay.

04 00 25 20 CDR The cloud of debris, none of it very large; and I wasn't able to see the descent stage go away. Not because it wasn't there; just because I was too busy.

04 00 25 38 LMP Okay, and we're coming up with VERB 32 here, for the first recycle, and I got the VERB 93 in. And I also taped on the interconnect. I can't get over there in this restraint system to use two

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hands, to do them both at once, so I have to do them one at a time, and that makes it a little bit slower. And then, when I went to shut them off, we got a sticky talkback on that SYSTEM A ASCENT FEED number 2; and it did not go barber pole when I shut it off. So I rapped the panel, and it went barber pole. So that was a bit dicey, too.

04 00 26 17 CDR Well, I don't see him out there any place.

04 00 26 22 LMP Okay, tape's going OFF.

04 00 44 27 LMP Tape is ON, and it's 96:44:30. Just set the final COMP for CDH. How many marks did we have there?

04 00 44 41 CDR I don't know.

04 00 44 42 LMP About 14, or something like that if I - -

04 00 44 44 CDR The number I last looked at was 13.

04 00 44 45 LMP Yes.

04 00 44 46 CDR I'm pretty sure.

04 00 44 47 LMP About 14 marks.

04 00 45 27 LMP Okay, let's hope that radar stays locked on to Dave. Okay, look at that - 10 miles.

04 00 45 35 CDR Oh, boy.

04 00 45 42 LMP Okay.

04 00 45 50 CDR Did you get that?

04 00 45 51 LMP Yes. Go. VERB - You want to do the VERB 90. Oh.

04 00 45 56 CDR Oh, shit.

04 00 45 58 LMP That's alright. Why don't you do it, and take a look at it right now.

04 00 46 02 CDR Yes.

04 00 46 03 LMP VERB 90, ENTER.

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Day 5 - Page 217  
Tape 09-03601

04 00 46 07 CDR What's the time?  
04 00 46 08 LMP Okay, the time is 96:58:14.  
04 00 46 19 CDR 58?  
04 00 46 20 LMP 58:14.  
04 00 46 27 CDR Yes.  
04 00 46 28 LMP Yes, good. Okay, come on radar. Stay locked.  
04 00 46 49 CDR Sure looks great. It's a big one. Well, that's  
the way it goes.  
04 00 46 54 LMP What do you want to do? Forget it?  
04 00 46 56 CDR Yes, let's just forget it.  
04 00 46 57 LMP Okay.  
04 00 46 59 CDR Okay?  
04 00 47 01 LMP Okay, 11 - -  
04 00 47 02 CDR 17 marks we had.  
04 00 47 04 LMP 17 marks. Okay.  
04 00 47 07 CDR Got that?  
04 00 47 08 LMP Okay, got it. Okay, you may have to get my -  
Okay, you going to P00?  
04 00 47 19 CDR/LMP You're in P00.  
04 00 47 20 LMP Okay, you ready?  
04 00 47 21 CDR Yes. Go.  
04 00 47 32 LMP Transmit the burn data to CSM. Gumdrops, Spider.  
04 00 47 37 CMP Go.  
04 00 47 39 LMP Okay, here's the burn. Minus 39.2, plus 0.1, and  
minus 13.7.  
04 00 47 54 CMP Roger. Minus 39.2, plus 0.1, and a minus 13.7.

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Tape 09-03601

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04 00 48 01 LMP That's Charlie.

04 00 48 02 CMP Okay ...

04 00 48 04 CC ... Houston. Do you read?

04 00 48 08 LMP Roger, Houston. Spider copies.

04 00 48 11 CC Roger. I just copied your solution. I have one that's pretty close to it, if you'd ... to copy a CDH pad.

04 00 48 17 LMP Roger. Go.

04 00 48 19 CMP Gumdrop.

04 00 48 21 CC Roger. And Roger, Gumdrop. 096:58:1400, minus 382, minus 009, minus 151, 305, minus 381, minus 153. End of update.

04 00 48 55 LMP Roger. 096:58:1400, minus 382, minus 009, minus 151, 305, minus 381, minus 153.

04 00 49 12 CC Spider, ... affirmative ...

04 00 49 15 CDR Okay, how did we make out?

04 00 49 17 LMP Good.

04 00 49 18 CDR Okay.

04 00 49 20 CMP Okay, Spider, Gumdrop here. I did not copy the dead ground. I copied you, and were all the signs minus?

04 00 49 27 LMP That's affirmative. All the signs were minus.

04 00 49 31 CMP Good, I got the ground pad now ... certain ... 1 minute late.

04 00 49 35 LMP Roger.

04 00 49 36 CDR Okay. Very good. We're going to do ours, I guess. I haven't had a chance to compare them, Dave, but they sound pretty good.

04 00 49 41 CMP Okay.

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Day 5 - Page 219  
Tape 09-02601

04 00 49 42 LMP Okay. Go. They - They're within a foot per second or so, even in D.

04 00 49 51 CDR Yes. Do you have our solution yet, Dave?

04 00 49 54 CMP Roger. I have minus 39.2, minus - -

04 00 49 58 LMP Oh, hold off.

04 00 49 59 CMP - - 0.1, minus 13.7.

04 00 50 01 CDR Roger. That's plus 0.1.

04 00 50 03 CMP Okay, plus 0.1.

04 00 50 05 CDR Alrighty.

04 00 50 08 LMP Okay, let's put it up there.

04 00 50 10 CDR Okay. We're standing for that mark. Signal strength is staying up, so we're probably going to get it.

04 00 50 15 LMP Yes. I'm going to have to hustle, too.

04 00 50 18 CDR Yes.

04 00 50 19 LMP After that - What's after that? You can go ahead and do the AUTO maneuver - -

04 00 50 20 CDR Roger.

04 00 50 21 LMP - - and let me get the AGS started here.

04 00 50 22 CDR ... call up 42, to do the AUTO maneuver.

04 00 50 26 LMP Cue me at 7 minutes here, Jim.

04 00 50 27 CDR Okay, go ahead, I'll - I'll - Matter of fact, I'll get the range rate for you.

04 00 50 35 LMP Okay, I can't go any further right now anyway.

04 00 50 37 CDR (Laughter) That ... don't ... is it?

04 00 50 41 LMP Yes.

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04 00 50 45 LMP Okay, you want to read it out for me, and I'll just sit over - -

04 00 50 46 CDR Okay.

04 00 50 47 LMP - - here in my corner and plod away.

04 00 50 52 CDR It's going to be close to 108 or so. Maybe 110.

04 00 51 11 LMP 4, 3, 2, 1 -

04 00 51 14 LMP MARK.

04 00 51 15 CDR 110.

04 00 51 17 LMP 110. Okay, thank you.

04 00 51 20 CDR Okay. I'm going to call up - Would you align the AGS? - I'm going to call up and do the maneuver now.

04 00 51 24 LMP Right.

04 00 51 25 CDR VERB 37, ENTER; 42, ENTER. Okay, it says 306, and I think our number was 305. Okay, we'll do the maneuver. Here we go.

04 00 51 51 CDR ... do a pitch up the right way.

04 00 52 28 LMP ... says minus 39.5 and minus 14.5.

04 00 52 32 CDR How about that? Okay, minus - Got that NOUN 86 stuff?

04 00 52 37 LMP Yes. Okay, you got it? Minus 39.1. All zips and plus - and minus 13.8.

04 00 52 49 CC Spider/Gumdrop; we'll see you over the Redstone at about 03.

04 00 52 53 CDR Roger. Did you get that?

04 00 52 57 LMP Yes, I got it.

04 00 52 58 CMP Roger. Gumdrop copies. Redstone, 03.

04 00 52 59 LMP Okay, I want to get my gloves on first.

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Day 5 - Page 221  
Tape 09-03601

04 00 53 07 CDR Okay. We don't need anything there; we might as well PRO over there.

04 00 53 12 LMP Okay. Okay, you can mush on here, and - -

04 00 53 14 CDR Okay, it's a 501.

04 00 53 15 LMP - - I'm going to get the AGS going here.

04 00 53 22 CDR MODE CONTROL, AUTO.

04 00 53 59 CDR Okay, MODE CONTROL, AUTO. We go down to ...

04 00 54 10 CDR HELIUM MONITOR, ASC PRESSURE 1 and 2.

04 00 54 19 LMP We're at 4 minutes here. Just got there?

04 00 54 21 CDR SUIT PRESSURE 1 and 2; CB(11), STAB CONTROL, AELD, CLOSE.

04 00 54 26 LMP And 16. I got mine.

04 00 54 28 CDR Okay.

04 00 54 29 LMP EPS, CROSS TIES - -

04 00 54 30 LMP/CDR BALANCE LOAD comes OPEN.

04 00 54 32 LMP Shoot, it's been OPEN. I forgot to close it.

04 00 54 34 CDR Alrighty.

04 00 54 41 CDR STOP button's UNCOVER.

04 00 54 49 LMP Boy, that scared me. That - that ammeter drifts up and - on the bus, and it was up at 100 amps, indicated.

04 00 54 56 CDR Oh, Jeez.

04 00 54 59 LMP It doesn't read anything worthwhile. Okay, you ready?

04 00 55 02 CDR Yes.

04 00 55 03 LMP 2 minutes, we want DFI, ON.

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04 00 55 04 CDR Right. 2 minutes, we want DFI, ON.

04 00 55 06 LMP Okay, what else do we do here except hold our breath?

04 00 55 09 CDR Yes. 5 seconds. You're going to get the FLASH 99; you're going to put to PROCEED.

04 00 55 14 LMP Right.

04 00 55 15 CDR AUTO ... at 3.5. Then it's going to go kapow, and the burn's going to be over.

04 00 55 21 LMP Yes.

04 00 55 24 CDR Let's see, TEMP ...

04 00 55 25 LMP Would you look at that? It's still locked on, or something.

04 00 55 27 CDR You're right. It is still locked on, so we didn't pitch up very much, at Z.

04 00 55 31 LMP Yes. We're in the right attitude though, huh?

04 00 55 34 CDR Yes. 30 - -

04 00 55 35 LMP Okay.

04 00 55 36 CDR - - 305 was the ground-calculated solution, and the PGNS called for 306.89.

04 00 55 41 LMP Okay. ... What, you got your window shade up?

04 00 55 49 CDR Yes. I'm on the dark ...

04 00 55 51 LMP It's a big difference, isn't it?

04 00 56 15 CDR Okay, 2 minutes.

04 00 56 18 LMP Okay, DFI POWER, ON.

04 00 56 20 CDR Yes. I verified the burn there, too, as best I can.

04 00 56 28 LMP Okay, that looks good.

04 00 56 30 CDR Yes.

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Day 5 - Page 223  
Tape 09-03601

04 00 56 32 LMP Okay. I'm just standing by to proceed.

04 00 56 41 CDR Good. Okay, Gumdrop, we're at 130 - -

04 00 56 45 CDR MARK.

04 00 56 49 LMP Okay, if we don't get ignition, what do we do?

04 00 56 51 CDR If we don't get ignition, I'm going to start thrusting. You come on with the ascent interconnects.

04 00 56 56 LMP Are you going to turn the ENGINE ARM off first?

04 00 56 58 CDR Yes, I'll do that.

04 00 56 59 LMP Yes, thank you. (Laughter) I can see us getting all of it, boom, boom.

04 00 57 04 CMP Spider, Gumdrop. Right with you and ready to support.

04 00 57 06 LMP Very good.

04 00 57 15 LMP 1 minute.

04 00 57 16 CMP ...

04 00 57 25 CDR Tape on?

04 00 57 27 LMP Tape is on.

04 00 57 28 CDR Okay.

04 00 57 46 CDR AVERAGE-G is ON.

04 00 57 48 LMP Okay.

04 00 58 13 LMP Get the ullage. There goes the burn. Burn is over.

04 00 58 22 CMP ...

04 00 58 25 LMP Okay, 2.4 - minus 2.4, plus 0.8, and plus 1, plus 0.1.

04 00 58 51 LMP Okay, the residuals are zero.

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Tape 09-03601

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04 00 58 55 CDR Well, are we safe? VERB 95 - let's see. Have you gone to POO, yet?

04 00 59 04 LMP Yes.

04 00 59 05 CDR Okay.

04 00 59 28 LMP Okay. Shoot, I'm sorry. I hadn't.

04 00 59 35 CDR But I looked down there, and I thought I saw the COMP light ON, and then I went back to looking outside here.

04 00 59 41 LMP Okay, ready for a CAL?

04 00 59 43 CDR Yes.

04 00 59 44 LMP BALANCE LOADS is going CLOSE.

04 00 59 45 CDR Shoot, we just broke lock.

04 00 59 48 LMP Hmm.

04 00 59 53 CDR Okay, Houston, that TM CAL coming.

04 01 00 09 LMP On the rendezvous radar. VERB 95, ENTER; VERB 37, ENTER; 20, ENTER. Okay.

04 01 00 27 CDR Okay, Houston, CAL's up.

04 01 00 29 CDR DFI, OFF now?

04 01 00 30 LMP DFI, OFF. Right.

04 01 00 32 CDR Okay, DFI's coming off, Houston. Probably nobody there.

04 01 00 37 LMP Say again.

04 01 00 38 CDR I said, there's probably nobody there.

04 01 00 39 LMP Yes.

04 01 00 40 CDR Hey, here we go. Let's see if it's out there. This is really a good AUTO pilot. You know that?

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Day 5 - Page 225  
Tape 09-03601

04 01 00 49 LMP Yes, it is. It really tracks nicely, doesn't it? Boy, it's right on 0.2 - 2 degrees per second. Oh, that sun is just right.

04 01 01 09 CDR Yes, I wonder how we're going to be able to do our docking.

04 01 01 30 LMP Okay.

04 01 01 33 CDR Hey, where's 2.2? Come on up there, baby.

04 01 01 36 LMP There it is. Doggone thing is really working good, isn't it?

04 01 01 42 CDR Sure is. Look at that. Here.

04 01 01 48 LMP Okay, that's good, huh?

04 01 01 51 CDR That's good.

04 01 02 00 LMP Okay, you can debrief the burn, by the way.

04 01 02 02 CDR Okay, just a second. Gumdrop, you got all your data?

04 01 02 05 CMP Roger, got it all.

04 01 02 07 CDR Okay, we're milling along here, locked on you again. Okay, that burn - You feel the ullage come on, and it was a lot more effective with just the ascent stage on.

04 01 02 16 LMP Sure was.

04 01 02 17 CDR And then, when the APS came on, it really belts you in the can, by comparison to the DPS. It starts, it stops, and it's all over with before you even know what the heck happened. I thought I saw a big pitch attitude, but I don't know what I saw.

04 01 02 31 LMP (Laughter) I don't know why. I agree with you. I don't know what the hell is going on.

04 01 02 45 CDR Okay.

04 01 02 51 CMP You're on the beam there. I got you.

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Tape 09-03601

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04 01 02 53 LMP	Well, Buddy, am I glad to hear that!
04 01 02 55 CMP	I am, too. And listen, it's great. You're about 1 degree from the center of the sextant.
04 01 02 59 CDR	That a boy, Davey. You remember that beer we were talking about the other night?
04 01 03 04 CMP	Roger.
04 01 03 05 CDR	I'll buy you one, babe.
04 01 03 10 CC	Spider/Gumdrop, Houston; standing by. How did it go?
04 01 03 14 CDR	Well, it's sort of a kick in the fanny by comparison to the DPS. But it went alright. And my good friend over there in the Gumdrop can see me again. I'm out in the daylight.
04 01 03 28 CC	Very good. Understand.
04 01 03 30 CMP	Houston, Gumdrop.
04 01 03 37 LMP	Houston, Gumdrop calling.
04 01 03 42 CC	Spider, Houston. We're still showing the APS armed. Could you verify that?
04 01 03 46 LMP	Oh, gee. Yes. Thank you, very much.
04 01 03 51 CDR	Thank you, Houston.
04 01 03 53 CC	Roger. You're welcome.
04 01 03 55 CDR	Shoot, that's the only thing we had to do on ENGINE ARM, OFF, too.
04 01 03 58 LMP	Okay, I - I still didn't hear much noise on that one. Did you?
04 01 04 02 CDR	No, no.
04 01 04 04 LMP	Very little noise.
04 01 04 06 CDR	I wonder if we ought to pull the A - -
04 01 04 07 CC	... Houston.

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Day 5 - Page 227  
Tape 09-03601

04 01 04 08 CDR - - AELD circuit breakers.

04 01 04 09 CC Did you burn the - the solution that I think you passed to Gumdrop?

04 01 04 12 CDR I burned the PGNS solution, which is the one I passed to Gumdrop.

04 01 04 17 CC Very good. Understand you burned it, and on the dot.

04 01 04 21 CDR That's affirmative.

04 01 04 27 CMP Houston, Gumdrop.

04 01 04 31 LMP Okay, let's start doing some updating into that old AGS here, and see if we can ... that son of a gun running.

04 01 04 37 CDR Okay.

04 01 04 41 CDR Hey, it's really going to be tough to do this, Rusty. This thing's got so much control, I don't know what to do with it.

04 01 04 44 LMP Yes, I know. Gumdrop, why don't you give me your message, and we'll relay it to them.

04 01 04 49 CDR Hey - -

04 01 04 50 CMP ... tell them where - were - was and how I ... but I guess you told them that. That's alright.

04 01 04 54 CDR You ready?

04 01 04 56 LMP Okay, yes we do. Yes.

04 01 04 59 CDR Oh, I stopped that one there. Come on you. That other one's hanging there, and we have to scrunch down a little low to make it look like it. Oh shoot, it's drifting out.

04 01 05 34 CDR Now, I don't know, but when it - when we had these things zeroed, the needle was over here on the side. I don't know where to put it.

04 01 05 40 LMP Okay, I'm just going to put it in the middle. Heck with it. Okay, that's a good 75 miles, right?

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Tape 09-03601

~~CONFIDENTIAL~~

04 01 05 46 CDR Right.

04 01 05 47 CDR/LMP MARK.

04 01 05 48 LMP CLEAR 316, plus 00750, ENTER.

04 01 05 55 CDR I'm going to take my helmet off and get a drink.

04 01 05 56 LMP And I want to do a VERB 93, ENTER; and a VERB 32, ENTER.

04 01 06 04 CDR Hey, why don't we pull the AELD circuit breaker?

04 01 06 09 LMP You don't trust this engine?

04 01 06 10 CDR Yes, but why do we keep it up?

04 01 06 15 LMP Because we don't give any more ignition signals or anything, for one thing.

04 01 06 47 LMP Oh, as a matter of fact, we're going to leave the tape running here. That's right. So we already got one mark into the radar, I mean into the AGS and ...

04 01 06 59 CDR (Laughter) Hey, look what I had on inside my helmet.

04 01 07 01 LMP I know. I saw that.

04 01 07 03 CDR (Laughter)

04 01 07 34 LMP Boy, it's taking a long while.

04 01 07 46 LMP There it is - 97:57: - -

04 01 07 50 CDR Push the NOMINAL, quick.

04 01 07 52 LMP - - 56. Hold on. Okay. 97:57:56. Stand by, I'll check with the - the NOMINAL was 97:56:23.

04 01 08 18 CDR Okay.

04 01 08 20 LMP 97:56:23, 97:56:23.

04 01 08 39 LMP Okay, ready for another mark there.

04 01 08 42 CDR Oh, shoot, I knew you would be.

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Day 5 - Page 229  
Tape 09-03601

04 01 08 53 CDR Man, that sun is really bright.

04 01 08 55 LMP Yes, you ought to pull up your shade.

04 01 09 09 CDR MARK.

04 01 09 10 LMP Mark. 71 miles. Right on the money. 316, CLEAR. 316, plus 00710, ENTER. Okay, 065, ... that says 112.9, 21.7, 27.9.

04 01 09 32 CDR Hey, there's Baja down there.

04 01 09 35 LMP There's plus 7, plus 0.3, minus 0.2. Look at that. That's beautiful.

04 01 09 44 CDR Yes. Hang in there, baby. Another couple of hours. Then I'll have you home.

04 01 09 59 LMP Okay, that's STOP, RESET, and a down, and there's -

04 01 10 20 LMP That's close.

04 01 10 45 LMP And Gumdrop, Spider. Any time you want to check our range and range rate, just let us know.

04 01 10 51 CMP Okay, stand by.

04 01 11 12 CDR Let's see, we have the VERB 93 in, don't we?

04 01 11 17 LMP Yes.

04 01 11 18 CDR 3 ... marks. Okay, ready for another one?

04 01 11 22 LMP Ready.

04 01 11 34 LMP Actually, there's no big rush, but that's okay.

04 01 11 41 CDR MARK.

04 01 11 42 LMP Mark. 69 point - or 68.5.

04 01 11 59 LMP See how it's doing. 114 feet per second. That's not very good. And range is 67.8. That's pretty good, not too bad.

04 01 12 10 CDR Okay.

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Tape 09-03601

~~CONFIDENTIAL~~

04 01 12 11 LMP It takes a few more before the range rate starts coming in.

04 01 12 13 CDR Yes.

04 01 12 36 LMP Let's see how our astronaut one is doing there. That looks good. That looks good.

04 01 12 42 CDR Ohhhh.

04 01 12 43 LMP That scared you?

04 01 12 44 CDR (Laughter)

04 01 12 51 LMP Houston, Spider.

04 01 12 54 CC Spider, this is Houston.

04 01 12 56 LMP Okay, onboard RCS is 82 and 75.

04 01 13 02 CC Roger. Copy, thank you ...

04 01 13 23 CMP Spider, Gumdrop.

04 01 13 25 CDR Go ahead, Gumdrop.

04 01 13 27 CMP I've got 67 miles and 112 feet per second.

04 01 13 30 CDR Okay, we have 67 miles and 107 feet per second.

04 01 13 36 CMP How about that?

04 01 13 37 CDR Now wait a second; you're 5 feet per second off. You're going to have to shape that up.

04 01 13 40 CMP Let me take some more marks, and I'll get it squared away.

04 01 13 44 CDR Alrighty.

04 01 13 51 LMP Okay.

04 01 13 53 CDR Jeess, you just never give up.

04 01 13 57 LMP We'll - I'm going to get this AGS going here.

04 01 13 59 CDR (Laughter) See that red light up there (laughter).

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Day 5 - Page 231  
Tape 09-0360i

04 01 14 02 LMP Yes.

04 01 14 03 CDR Hey, that's really a lot that you're doing.

04 01 14 05 LMP Oh, it's not too bad.

04 01 14 06 CDR Take my ...

04 01 14 13 SC (Yawn)

04 01 14 16 LMP Let's see how our rendezvous radar temperature's doing; it's 95 degrees. You're going to be a while ahead. 95 and 97.14.

04 01 14 36 LMP Oh, I'm plotting these things all wrong. I thought that that was 86. 86 is down here. Okay, we're right on the curve.

04 01 14 59 CDR Good.

04 01 15 03 LMP You coming in there, Tiger?

04 01 15 06 CDR Yes. Tell you what, to hurry up - spend a little fuel now, and save some later.

04 01 15 18 LMP How you going to save some later?

04 01 15 20 CDR Well, what I was going to do, is going to take a mark, here, and stop playing horsearound.

04 01 15 27 CDR Okay, -

04 01 15 28 CDR MARK.

04 01 15 29 LMP Mark. 64.2.

04 01 15 44 CDR Coming in. Good.

04 01 15 58 CDR Is there anything else we need to do along here?

04 01 16 01 LMP No. Until we get to 45 miles.

04 01 16 05 CDR 10 marks, we're going to do a recycle. 10 marks, have we done that? No, we haven't done that yet.

04 01 17 21 CDR Want me to turn that over?

04 01 17 24 LMP Oh, yes, I guess so.

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04 01 17 26 CDR      Soon as that pitch needle dribbles up there we'll  
be on.

04 01 17 31 LMP      Dribbling slowly.

04 01 17 38 CDR      Shoot, what did it do, stop dribbling?

04 01 17 40 LMP      Sure did.

04 01 17 47 CDR      Just a minute, now ...

04 01 17 58 CDR      Hey - -

04 01 17 59 CDR      MARK.

04 01 18 00 LMP      Okay. Mark 62.1.

04 01 18 10 LMP      Okay, I think I'll put in a range rate here.

04 01 18 15 CDR      Oops. Let me get over there.

04 01 18 25 LMP      Okay, what is it? 107 and a - -

04 01 18 28 CDR      Yes.

04 01 18 35 LMP      Okay.

04 01 18 43 LMP      Okay, 10 marks, and I'll recycle.

04 01 19 17 LMP      Tape, just for your information, the AGS - on  
occasion here, I clear it when I - when I hit the  
CLEAR button, I get an OPERATOR ERROR. And I've  
had to hit CLEAR several times consecutively in  
order to keep the OPERATOR ERRORS off.

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Day 5 - Page 233  
Tape 09-03601

04 01 19 58 CDR Boy, we really do look coelliptic.

04 01 20 03 LMP Do we?

04 01 20 04 CDR Yes, it's been hanging right in 107, you know.  
Yes, the range rate.

04 01 20 12 LMP That's the way we like them.

04 01 20 14 CDR Right.

04 01 20 41 CDR Nominal is 19.8 and 11.2. Okay, there we are with  
our time.

04 01 20 53 LMP 97:57:33. So, we're 1 minute late. That's the  
way to be.

04 01 21 05 CDR Better late than never, huh?

04 01 21 07 LMP Yes.

04 01 21 12 CDR Boy, that sun is really bright.

04 01 21 14 LMP Yes.

04 01 21 15 CDR It's not the sun, I guess; it's just the earth.

04 01 21 18 LMP Gumdrop, Spider. For your information, we've got  
a TPI time that's just 1 minute late right now.

04 01 21 25 CMP Okay. I've got a couple of solutions, and I've  
got 98:03 and 98:04.

04 01 21 31 LMP Roger; ours are 97:57:33.

04 01 21 39 CMP 97:57:33. Okay.

04 01 21 46 LMP That's pretty stable, boy.

04 01 21 48 CDR Um. I wonder what they're thinking about in there?

04 01 21 54 LMP I don't know, but it takes a while, doesn't it?

04 01 21 56 CDR Yes, it sure does. We may have some trouble getting  
through that thing for TPI. You notice all this  
perigee torquing and gyro dynamics that we're  
getting and - (laughter) You've been steady as a  
rock all day.

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04 01 22 15 LMP Yes, I sure have.

04 01 22 33 CDR Did you ever get the AGS all lined up and everything?

04 01 22 37 LMP Yes, let me set the time again. I've got to take another series here.

04 01 23 06 CC Spider, Gumdrop, this is Houston. I have a ground solution, when you're ready to copy.

04 01 23 12 CDR Spider here. Just a moment.

04 01 23 14 CMP Gumdrop's ready.

04 01 23 17 CC We're going to have you in contact for about another 12 minutes.

04 01 23 32 LMP Okay, Spider's here ready to copy.

04 01 23 38 CC Okay, Spider. Can you take it now, Gumdrop?

04 01 23 41 CMP Roger, all set. Go ahead.

04 01 23 44 CC Roger, reading TPI: 097:57:4500, plus 196, plus 001, minus 105, 223, no roll or pitch, 2670, minus 1010, forward 223, all zips, up 003. End of update.

04 01 24 34 LMP Roger. Understand. 097:57:4500, plus 196, plus 001, minus 105, 223, zips and zips, 2670, minus 1010, forward 223, zips, and up 003. And did you copy our DSKY on our last recycle?

04 01 25 03 CC Affirmative, Spider. Looks like we're shaping up.

04 01 25 08 LMP Looks that way.

04 01 25 10 CMP Gumdrop copied.

04 01 25 12 CC Gumdrop.

04 01 25 14 LMP ... You and the UP/DOWN component.

04 01 25 17 CDR (Laughter) Yes. Not, bad, huh? How does - how do the times agree?

04 01 25 25 LMP Within - 12 seconds off.

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Day 5 - Page 235  
Tape 09-03601

04 01 25 28 CDR 12 seconds. That's not bad. I'll take it.

04 01 25 33 LMP It's the best sim we've run.

04 01 25 55 LMP Okay, ready for some more AGS stuff.

04 01 25 59 CDR Okay, good. I'm almost lined up.

04 01 26 19 CDR On, hell. We're going to have to get this one done on the fly. Stand by; stand by; stand by.

04 01 26 30 CDR MARK.

04 01 26 31 LMP 53.0. Okay.

04 01 26 51 CC Spider and Gumdrop, that was our last update. We're going to go with that pad.

04 01 26 59 LMP Spider, here. Roger.

04 01 27 00 CMP Gumdrop, Roger.

04 01 27 05 LMP Hey, Smokey, is Dave Reed smiling?

04 01 27 09 CC Yes, he's - he's pretty happy, but he's not going to relax until you've finished burning.

04 01 27 16 LMP He'd better not. We may need that two-burn solution yet. (laughter)

04 01 27 45 LMP Gumdrop, Spider.

04 01 27 49 CMP Go ahead.

04 01 27 50 LMP As soon as we get into the dark, give me a look-see. If you don't see any tracking light, which I guess you won't, we'll put the docking lights on, and you might be able to get a mark on those.

04 01 28 00 CMP Okay. Might be able to do that at that range.

04 01 28 02 LMP Right. At that range with that big eye ball you've got.

04 01 28 09 CMP Roger.

04 01 28 12 LMP Okay?

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04 01 28 44 LMP Hey, with that docking - undocking episode we had - -  
04 01 28 47 CDR Ready?  
04 01 28 48 LMP All set.  
04 01 28 50 CDR MARK.  
04 01 28 51 LMP Mark, 50.3.  
04 01 29 01 LMP For that little undocking episode - We're supposed  
to do a recycle at 16 minutes. I don't know if we  
want to or not.  
04 01 29 05 CDR No.  
04 01 29 09 LMP Do you want to skip it? I mean at the 17 marks?  
04 01 29 14 CDR No, let's go in a little closer and do one more  
recycle.  
04 01 29 17 LMP Two? We've only got 14 more minutes, and it takes  
us 4 minutes to get one.  
04 01 29 22 CDR Yes, okay, let's do it now.  
04 01 29 24 LMP Okay. I'm wondering whether we ought to just maybe  
forego that - those DTO's.  
04 01 29 35 CDR Yes, that's what I was thinking. I think we ought  
to get up there and move around a little bit and  
say, "Okay, let's dock."  
04 01 29 40 LMP Yes.  
04 01 29 41 CDR See what's going to happen. He doesn't have a  
spotlight.  
04 01 29 44 LMP He doesn't have a spotlight; your COAS doesn't work  
too well - -  
04 01 29 47 CDR I can't - I - -  
04 01 29 48 LMP - - we don't know about that docking probe.  
04 01 29 49 CDR I'll bet you 2 bits that I can't even dock. I bet  
you he's going to have to end up doing the docking.

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Tape 09-03601

04 01 29 53 LMP And we'll thrust at him.

04 01 30 02 CDR I want to reset the DAP when we get in here a little closer. Guess maybe I could do that right now. When we're - wait until I finish this recycle, though. Load up and put the A system on align.

04 01 30 22 LMP Okay, 97 - Oh, look at that, would you?

04 01 30 24 CDR Where? How far off are we now?

04 01 30 27 LMP Right there. No, it's up there.

04 01 30 31 CDR 4 seconds.

04 01 30 58 CDR Matter of fact, I guess this is as good a time to discuss this with Houston as not. Houston, this is Spider.

04 01 31 05 CC Hello, Spider. Houston here.

04 01 31 07 CDR Roger. Concerning the episode we had coming off the probe, and some little DTO's we get back up there, I think it might be wise to go ahead and dock when we get there without waiting until dark.

04 01 31 26 CC Roger, Spider. We copy, and sounds like a pretty good idea.

04 01 31 31 CDR Why don't you go through those DTO's and see if there is anything that's really important there; and, if so, we'll try to get it for you. But otherwise I think we might see if that probe's going to work.

04 01 31 41 CC Roger. Understand. We're - we've got that in work.

04 01 32 14 CDR What was it? Just right?

04 01 32 16 LMP 0.3 of a foot per second off there. How about a 415 here?

04 01 32 24 CDR Okay, stand by 1.

04 01 32 45 CMP Spider, Gumdrops.

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04 01 32 46 LMP Go ahead, Gumdrops. Spider.

04 01 32 48 CMP Okay, mine's converging now. I've got 97:58 ...  
on my current solution.

04 01 32 54 CDR Good show.

04 01 32 55 LMP Very good, very good. Ours is now within about  
3.7 seconds of the ground. The last one was  
97:57:41, I think.

04 01 33 05 CMP I've got 97:58:19.

04 01 33 08 CDR Okay, very good. Sounds like we'll all be together  
there.

04 01 33 11 CMP How about that?

04 01 33 12 LMP Okay, you ready?

04 01 33 14 CDR No. I got distracted. Okay, stand by.

04 01 33 26 CDR MARK.

04 01 33 27 LMP Mark. 45.8.

04 01 33 30 CDR We can expect getting in another plot pretty soon.

04 01 33 34 LMP Right, I'm ready for it.

04 01 33 41 CDR Over Africa, there.

04 01 33 43 LMP In fact, we can get it right now, if you want to  
get one pitch up PULSE.

04 01 33 53 CDR Right there.

04 01 33 54 LMP MARK.

04 01 33 55 LMP And that's 45.0, huh?

04 01 33 59 CDR Right.

04 01 34 04 LMP That's 12.22.

04 01 34 09 CC Spider, Gumdrops, this is Houston. We're about a  
minute or so LOS from Canaries. There is an ARIA,

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Tape 09-03601

if you need it, up to about 42; and we'll see you at Carnarvon at 06 - -

04 01 34 21 CC

Tell them Dave Reed's smiling.

04 01 34 23 CC

- - And Dave Reed is smiling now; and we might catch you at Tananarive at 49, but we haven't had much luck yet.

04 01 34 33 CDR

Okay.

04 01 34 46 LMP

See our point?

04 01 34 48 CC

And Spider, this is Houston. Did you - did either vehicle read over Tananarive the last pass, when we were calling?

04 01 34 56 LMP

Oh boy, I don't remember.

04 01 35 00 CDR

Houston, this is Spider. I don't remember. We've been over so many stations so many times, I couldn't tell you.

04 01 35 08 CC

Okay, it was right at around CSI, right - immediately after your CSI burn.

04 01 35 13 CDR

Roger. I real - -

04 01 35 14 LMP

Yes, we did.

04 01 35 15 CDR

- - you once or twice, but it was pretty bad.

04 01 35 17 LMP

Alright, we called the CDH time down to you, too, but didn't get any reply.

04 01 35 24 CC

Okay, thank you.

04 01 35 26 CMP

And Gumdrop doesn't remember whether he heard you or not.

04 01 35 30 CC

Okay.

04 01 35 32 LMP

Okay, a couple more of these - -

04 01 35 35 CDR

What do you want? You want one of those marks, that's what I'm getting for you.

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Tape 09-03601

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04 01 35 37 LMP Yes, another one of these marks.

04 01 35 47 CDR Oh, you fink head.

04 01 35 50 CDR MARK.

04 01 35 51 LMP Mark. 43.2.

04 01 35 57 CDR Okay, let me get in here with this VERB 48.  
I'll read that. VERB 48, ENTER; VERB 21, ENTER

04 01 36 07 LMP Hey, let me pitch up one PULSE here.

04 01 36 08 CDR Okay, go. Let's see. Zero, 2 JET A. Zero zero - -

04 01 36 14 LMP We're hold at 42.5.

04 01 36 18 CDR - - zero zero, zero zero.

04 01 36 19 LMP 42.5.

04 01 36 21 CDR I'm rolling. 2 JET A, define ACA, 0.3 of a de-  
gree DEADBAND, and 2 degrees per second. Alright.  
PRO; VERB 34, ENTER.

04 01 36 57 LMP It getting dark?

04 01 36 59 CDR No, not really.

04 01 37 00 LMP Let me open up my simulator window here. I'd like  
to see part of this rendezvous.

04 01 37 08 CDR Which part? (laughter)

04 01 37 11 LMP The finish.

04 01 37 16 CDR Wonder if we can see him out there?

04 01 37 18 LMP Depends on what the temperature of the clouds is.  
Oh, they're way down.

04 01 37 21 CDR I can see him, I think.

04 01 37 23 LMP Look at the landing data -

04 01 37 24 CDR Hey, Davey, I think I see you again.

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Day 5 - Page 241  
Tape 09-03601

04 01 37 27 CMP Oh, very good.  
04 01 37 31 CDR Yes, I do see him.  
04 01 37 33 LMP Okay, we're at 100 - -  
04 01 37 34 CMP Gee, you're awful small.  
04 01 37 36 LMP - - 100 degrees - -  
04 01 37 37 CDR I don't doubt that at all.  
04 01 37 39 LMP 97:40.  
04 01 37 41 CDR We're still out at 41 miles.  
04 01 37 46 CMP Okay, and, as a matter of fact, you're fading on me.  
04 01 37 55 LMP Okay, we're below the line, Jim.  
04 01 37 58 CDR Are we really?  
04 01 37 59 LMP Yes, on the radar temperature.  
04 01 38 00 CDR Oh, boy - -  
04 01 38 01 CMP I've got you again.  
04 01 38 02 CDR On the radar.  
04 01 38 03 LMP I'm sorry.  
04 01 38 08 CMP You're going through the horizon right now.  
04 01 38 11 CDR Okay.  
04 01 38 15 LMP Where are you going, huh?  
04 01 38 19 CDR Where am I going?  
04 01 38 21 LMP Yes.  
04 01 38 24 CDR Where am I going?  
04 01 38 25 LMP Yes, are we pitching up - excuse me.  
04 01 38 26 CDR No.

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Tape 09-03601

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04 01 38 27 LMP Okay, I'm sorry, I thought we were pitching up. I had looked out the window, and I saw us way up in the air here.

04 01 38 33 CDR No.

04 01 38 34 LMP Hey, there he is. By George. Okay, how about another mark here?

04 01 38 46 CDR What kind? A radar for the AGS or radar for the chart?

04 01 38 51 LMP No, I think we did a chart one last, so we'll do a AGS one here.

04 01 38 55 CDR Okay.

04 01 39 07 CDR Okay, stand by.

04 01 39 09 LMP Okay.

04 01 39 10 CDR Oh, hell.

04 01 39 23 CDR MARK.

04 01 39 24 LMP Mark, 39.5.

04 01 39 25 CMP Spider, Gumdrop. Will you have your final solution before, like about a minute?

04 01 39 30 CDR I hope so, Dave.

04 01 39 32 CMP Okay, just to remind you that I'd like your time as soon as you get it.

04 01 39 36 CDR Yes, we're going to PROCEED at 14 minutes, and then we'll give it to you as soon as it comes up, which should be in about a minute or two.

04 01 39 43 CMP Okay, thank you.

04 01 39 44 LMP Oh, by the way. That time is wrong now.

04 01 40 04 CDR We're getting on down close to the end, aren't we?

04 01 40 06 LMP Yes.

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Day 5 - Page 243  
Tape 09-03601

04 01 40 07 CDR Got to start thinking what we are going to do.  
TPI. That's TPF. KEY RELEASE, 5 minutes. What  
am I doing over on that page?

04 01 40 18 LMP Oh, can we get another one for the chart?

04 01 40 21 CDR Sure.

04 01 40 43 CDR Okay, stand by.

04 01 40 50 CDR MARK.

04 01 40 51 LMP Okay, it's right on the money, 38 miles and 14.4.  
38, I said? Yes, 33 and 14.4.

04 01 41 09 CDR Very good.

04 01 41 20 LMP Boy, I need to blow my nose.

04 01 41 22 CDR Oh, me too. I've had a head full. That Actifed  
sort of helped me at night, though.

04 01 41 29 LMP Scratch that thing.

04 01 42 16 LMP Okay - -

04 01 42 18 CDR Okay ... here.

04 01 42 19 LMP We've got our last radar warning lights on. Okay,  
last AGS mark.

04 01 42 27 CDR Okay, AGS mark, okay?

04 01 42 29 LMP ... I mark.

04 01 42 48 CMP Okay, Spider, I still have you against the earth  
background.

04 01 42 52 LMP Great!

04 01 42 56 CMP This thing is really tracking.

04 01 42 59 LMP Do we have a light? Okay?

04 01 43 01 CMP No, no, it's still daylight to me. You're a little  
black spot in the dark - in the light background.

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Tape 09-03601

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04 01 43 07 CDR Okay, stand by.

04 01 43 09 CDR MARK.

04 01 43 10 LMP Mark, 35.8.

04 01 43 13 CDR Okay. Okay, we're at about 14:25 now.

04 01 43 19 CMP Okay.

04 01 43 22 LMP 503 minus 00104, ENTER. Okay.

04 01 43 34 CDR Throw in that one last mark.

04 01 43 37 LMP Put that on here.

04 01 43 38 CDR No, on here.

04 01 43 39 LMP Oh, yes. Oh, okay. Let's get one more on the chart here, since you're close.

04 01 44 10 CDR Soon as that time comes up, why don't you give ol' Davey a call. There it is, right there.

04 01 44 17 LMP Okay, Gumdrop. This is Spider. Our time - ready to copy? Gumdrop, you ready?

04 01 44 30 CMP Roger, standing by. Go ahead and read it.

04 01 44 32 LMP Okay. 97:57:59.

04 01 44 39 CMP Okay, good. My last time was 97:58:08.

04 01 44 44 LMP Roger.

04 01 44 46 CDR That's great.

04 01 44 56 LMP Where do you stand now?

04 01 45 01 CDR What are you looking for now? You looking for - -

04 01 45 04 LMP What I'm - I'm looking for a 40 - for a 304 re -  
I'm looking for a plot point.

04 01 45 09 CDR Right there.

04 01 45 10 CDR MARK.

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Tape 09-03601

04 01 45 12 LMP Hold. Okay, it's 31.9 - 32 - 34. ...

04 01 45 18 CDR 33.9, yes.

04 01 45 27 LMP ... plus 60.

04 01 45 40 LMP Okay, we're right on the plot.

04 01 45 42 CDR Okay.

04 01 45 52 CDR Alrighty. There we go.

04 01 45 54 LMP ... 11 ... 7 ... 081 is - Why don't you call in to him?

04 01 46 09 CDR Dave, here are our DELTA-V's.

04 01 46 12 CMP Go ahead: I'm ready to copy.

04 01 46 13 CDR Roger; plus 19.4, plus 0.4, minus 9.7.

04 01 46 23 CMP Roger; plus 19.4, plus 0.4, minus 9.7.

04 01 46 30 CDR Roger, that's correct.

04 01 46 32 CMP Good.

04 01 46 39 LMP You want to compare now? Okay, how do they look?

04 01 46 43 CDR Where are they?

04 01 46 44 LMP 19.4. I've got 19.6.

04 01 46 47 CDR Okay, there they are; 19.4, 19.6.

04 01 46 49 CMP Okay, Spider, Gumdrop.

04 01 46 51 CDR Okay, that's great. Go ahead, Gumdrop.

04 01 46 54 CMP Okay, you've got a hot mike, and also my elevation angle on your time is 27.32.

04 01 46 59 CDR Great.

04 01 47 03 LMP Okay, I want to set the DET; stop, DOWN.

04 01 47 23 LMP Okay ...

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Tape 09-03601

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04 01 47 25 CDR Okay, we can go on to a P00 and update the AGS.  
PRO. P00.

04 01 47 31 LMP Okay, I'm - I want to - first I want to get the  
AGS solution here.

04 01 47 34 CDR Okay, fine. And we've got an 8-minute mark for  
you, too, in here. Oops, where the hell did he go?  
Oh, there he is. I see him.

04 01 47 49 LMP You got him?

04 01 47 50 CDR Yes.

04 01 47 54 LMP Okay, I'm going to be ready in just a second.

04 01 47 56 CDR Okay, fine. Oh, the moon is going to be out there.

04 01 48 00 LMP Okay.

04 01 48 01 CDR ...

04 01 48 02 LMP CLEAR 303. Read, 23.46. CLEAR 257. Read -

04 01 48 17 CDR Dave, just as a matter of interest, the moon has  
just come up, and it's going to be shining right  
on our front face; so maybe you'll be able to  
track us in the moonlight.

04 01 48 25 CMP Great!

04 01 48 26 CDR And I also got ...

04 01 48 27 LMP Can he still see us?

04 01 48 28 CDR I'll go to docking lights for you at this time,  
since we don't have a light.

04 01 48 32 CMP Okay.

04 01 48 33 LMP Okay, I'm ready for the update.

04 01 48 35 CMP Here's my answer to your time: 19.4 zero, and 8.8.

04 01 48 41 LMP Great!

04 01 48 44 CDR You ready?

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Tape 09-03601

04 01 48 45 LMP Ready. Okay, I'm ready for the 8-minute mark.

04 01 48 49 CDR Okay.

04 01 48 57 LMP Okay, I got the update.

04 01 49 04 CDR Gee, these marks are going to be a lot more ragged than you've been getting.

04 01 49 06 LMP 100 feet per second, yes - CLEAR 3 - 101 that is.

04 01 49 11 LMP Yes.

04 01 49 12 CDR Okay.

04 01 49 14 LMP Okay, mine was 130.1, Okay?

04 01 49 15 CDR Yes.

04 01 49 16 LMP ... 400 plus - -

04 01 49 20 CDR Hey, what happened here?

04 01 49 21 LMP Huh?

04 01 49 22 CDR What are we doing?

04 01 49 24 LMP What?

04 01 49 25 CDR We just lost - Oh, there we go - Oh, we were doing that. Okay.

04 01 49 29 LMP I hope not.

04 01 49 30 CDR That old thing. We just lost the control system there.

04 01 49 34 LMP Oh, yes.

04 01 49 35 CDR I keep forgetting that AGS update does that. That was a bad time with me. Okay, we're 20 seconds to go here.

04 01 49 43 LMP Okay. Damn alignment isn't that good. Okay. 5, 4, 3, 2, 1 -

04 01 50 00 LMP MARK.

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Tape 09-03601

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04 01 50 03 LMP What have you got there, 29.5 and ...

04 01 50 05 CDR 29.5, right - 28.5.

04 01 50 07 CC ... Standing by. I did copy your final solution. Sounds great.

04 01 50 13 CDR Roger, Spider. That was 28.5, Rusty.

04 01 50 15 LMP Okay, I got it.

04 01 50 17 CDR Okay, fine. Okay, I'm going to 41 now.

04 01 50 23 LMP Yes, 20.5.

04 01 50 24 CDR 37 ... 44 -

04 01 50 26 CC Spider, Houston. The only one I wasn't sure of was your DELTA-V<sub>x</sub>. I read it as 197.

04 01 50 36 CDR I think it was 194. I'll have to check. Just a minute.

04 01 50 39 CMP 19.4, Smockey.

04 01 50 50 CDR Did you want anything out of here?

04 01 50 52 LMP NOUN 86, yes. I need a NOUN 86. Okay, and that's plus 19.4, plus 0.4, and minus 9.7. Okay, you can KEY RELEASE on that. Okay. CLEAR, and remind me of the 5-minute mark.

04 01 51 23 CDR Right. I've got my eye on it.

04 01 51 37 CDR Shoot, I've lost it again. Can't see with all the lights up so bright.

04 01 51 51 CDR There's nothing out there I need to look at. Oh, I know, he's going to the other attitude. Getting drowsy. Oh, shoot, we're going to lose lock on him.

04 01 52 11 LMP I hope not. Call me on that 5 minutes.

04 01 52 18 CDR Okay, you've got 40 seconds. Yes, he's turned around. We're going to be lucky if we hold lock. It's coming back up now a little.

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Tape 09-03601

04 01 52 44 CDR Shoot, that elevation angle ... very high.

04 01 52 49 LMP Okay, 11 seconds.

04 01 52 54 CDR So you have 5 seconds to go.

04 01 52 57 LMP 4, 3, 2, 1 -

04 01 53 00 LMP MARK.

04 01 53 01 LMP Okay, 26.1 - 26.0 and 99.

04 01 53 11 CDR Okay, go over to the other side here.

04 01 53 14 LMP 2208, KEY RELEASE.

04 01 53 17 CDR Oh, let's see. We got that. 5 minutes. I'm going to VERB 77 here.

04 01 53 22 LMP Okay.

04 01 53 23 CDR 77, ENTER.

04 01 54 04 LMP Okay, I got a DOWN 1.

04 01 54 19 CDR Where's the next time we do an ORDEAL update? Maybe I'd better do it here; guess I better. Let's see, VERB 83, ENTER.

04 01 54 41 LMP Okay, I got a 420 and DOWN 1.

04 01 54 49 CDR Okay. Going down to the ... That's 24, 45.53, 25.9. How does it compare, Rusty?

04 01 55 09 LMP Compares good, within a foot per second.

04 01 55 13 CDR Great.

04 01 55 31 LMP Okay, how much time we got?

04 01 55 33 CDR 2 left.

04 01 55 34 LMP 2 minutes? That's some kind of a world's record.

04 01 55 36 CDR Okay, let's see what else we have to do here. Copy our angle ..., verify the burn attitude, compare

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PGNS and AGS attitude errors. I don't see him out there. I'm sure he's turned around.

04 01 55 51 LMP Well, the radar sees him.

04 01 55 53 CDR Yes. 0.05 -

04 01 55 59 LMP Okay, how's your burn attitude? Boy, look at that; we're even on this.

04 01 56 02 CDR Yes.

04 01 56 06 LMP The old REFSMMAT came through, huh?

04 01 56 09 CDR Oh, yes. We're on over there, aren't we?

04 01 56 11 LMP Yes. Okay, AVERAGE G's coming ON; I'm monitoring on the AGS here.

04 01 56 16 CDR Okay, I'm just going to burn it out straight ahead.

04 01 56 19 CC ...

04 01 56 22 CDR Roger.

04 01 56 24 CMP Spider, Gumdrop, coming up to 133 now, and ready to support.

04 01 56 29 CDR Okay, I was right with you.

04 01 56 30 CMP Okay.

04 01 56 31 LMP ... call something, huh?

04 01 56 32 CDR Yes.

04 01 56 33 LMP Good, I like it that way.

04 01 56 44 LMP The other DAP's set in now, right?

04 01 56 46 CDR Right.

04 01 56 48 LMP Change SYSTEM A. Okay?

04 01 56 56 CDR Works like a charm - -

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Day 5 - Page 251  
Tape 09-03601

04 01 56 57 LMP Boy, and he's right on top of old Scorpio.

04 01 57 00 CDR I don't see him out there. Oh, yes, I saw him then. Okay, he's right where he's supposed to be.

04 01 57 08 LMP Yes, the stars are exactly where they were in the simulator.

04 01 57 12 CDR Yes, the moon wasn't there, though.

04 01 57 14 LMP Yes.

04 01 57 27 CDR Do you know - -

04 01 57 28 LMP ... AVERAGE G ...

04 01 57 29 CDR - - the time of this burn, by chance?

04 01 57 31 LMP No.

04 01 57 32 CDR AVERAGE G is ON.

04 01 57 33 LMP Right.

04 01 57 50 CDR About 10 seconds.

04 01 57 52 CMP Roger.

04 01 57 53 CDR Okay.

04 01 58 02 CDR ... Thrusting.

04 01 58 10 LMP Boy, it looks like the 4th of July, doesn't it?

04 01 58 12 CDR Yes. Okay, we're getting it in slowly here.

04 01 58 18 CMP Good.

04 01 58 25 LMP You ought to be able to see it. It looks like the 4th of July.

04 01 58 28 CMP I can; I can see you perfectly.

04 01 58 38 LMP Okay, we're going to go to POO as soon as you're done.

04 01 58 41 CDR Okay, just a second now.

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04 01 58 45	CMP	How'd you do?
04 01 58 48	LMP	Looks good.
04 01 58 50	CMP	Okay.
04 01 58 51	LMP	6.
04 01 58 53	CDR	Okay, we had all zips when we went.
04 01 58 55	CMP	...
04 01 58 59	LMP	There's POO.
04 01 59 00	CDR	Okay.
04 01 59 01	LMP	Okay, coming on to the next side here. Okay, VERB 93 - -
04 01 59 06	CDR	I need a 76, ENTER.
04 01 59 07	LMP	- - ENTER, right away.
04 01 59 08	CDR	VERB 76 - -
04 01 59 09	LMP	Okay?
04 01 59 10	CDR	ENTER.
04 01 59 11	LMP	Okay, and I'll get that other.
04 01 59 12	CDR	Verb 93 - -
04 01 59 13	LMP	3, right. ENTER. - -
04 01 59 14	CDR	- - ENTER.
04 01 59 15	LMP	Okay, VERB 37, ENTER; 20, ENTER. Did we ever break lock?
04 01 59 21	CDR	No.
04 01 59 22	LMP	Okay.
04 01 59 28	LMP	Okay, I'm going to bypass the maneuver.
04 01 59 30	CDR	Let's see, we're at 20 miles -

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Day 5 - Page 253  
Tape 09-03601

04 01 59 33 CMP Hot mike.  
04 01 59 34 CDR - - 20 miles.  
04 01 59 35 LMP Thank you.  
04 01 59 37 CDR - - 2 points, so we're all right; makes 5. Yes, I  
verify he's out there. We can use a ...  
04 01 59 46 LMP Okay, you veri - watch - watch ... in that.  
04 01 59 48 CDR Woo. ...  
04 02 00 18 CDR Look at that. Line of sight reads what it's  
supposed to be. Okay, now what we have to do -  
we have to do a 93 and a 20, bypass the AUTO  
maneuver, 35 - we've got that up working - set  
the DET, copy the angle for the charts, at  
5 minutes.  
04 02 00 47 LMP Okay. Okay, and I've got - you got 22 FORWARD  
on that, which is just right, and zero there.  
Fantastic! The AGS said you did just right.  
04 02 01 08 CDR Good old AGS.  
04 02 01 09 LMP Good old AGS and count DELTA-V pretty good. That  
may be all it can do, but it can do that.  
04 02 01 25 CDR Okay, you ready for your 5-minute mark?  
04 02 01 29 LMP Yes, do we want to take another plot?  
04 02 01 33 CDR Okay, if you'd like.  
04 02 01 34 LMP Yes, if you're on - -  
04 02 01 35 CDR Sounds like a pretty good idea. Okay.  
04 02 01 40 CDR MARK.  
04 02 01 41 LMP Okay, mark, and it was now - what was the - -  
04 02 01 44 CDR 17 miles.  
04 02 01 45 LMP - - 17. Okay. 17, 32.5. There we go.

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04 02 01 58	CDR	Great. Okay, get ready for your mark.
04 02 02 06	LMP	Okay. I'm all ready.
04 02 02 55	LMP	5, 4, 3, 2, 1 -
04 02 03 00	LMP	MARK.
04 02 03 01	CDR	Okay. Right ...
04 02 03 02	LMP	Okay, and it was 15.9.
04 02 03 04	CDR	Right.
04 02 03 05	LMP	And 107?
04 02 03 07	CDR	Right, yes, 107's mark. Okay, I'll just sit here, and putt along until we get to 7 minutes.
04 02 03 14	LMP	34.73.
04 02 03 21	CMP	Spider, Gumdrops. I'm afraid I just can't see you without that light.
04 02 03 24	CDR	Okay, Dave. We only ask you to do what's humanly possible.
04 02 03 34	CMP	Okay. You're against that earth background with a bunch of clouds, which doesn't help anything.
04 02 03 45	CDR	Yes, I know it. Are you all set up for our docking?
04 02 03 50	CMP	All set.
04 02 03 51	CDR	Okay, what do you think happened to the probe on the way out, Dave?
04 02 03 55	CMP	I'm not real sure. I think it just got hung up on the capture latches. I took a look to see if it extended all the way, and the ... was in the retract position. And, when I went back up to extend the second time, you dropped right off.
04 02 04 08	CDR	Okay. I want to get on that thing as soon as possible, just in case something is wrong.

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Tape 09-03601

04 02 04 15 CMP Roger, I'm with you.

04 02 04 26 LMP Okay, are you on, Jim?

04 02 04 29 CDR Yes, I'm on - right now.

04 02 04 30 LMP 2, 1 -

04 02 04 31 LMP MARK.

04 02 04 32 LMP Okay, and that was 14 - 14, and you got to hit a PROCEED here at 7.

04 02 04 39 CDR ... I've got the PROCEED, ...

04 02 04 42 LMP 14, 37.4. We are right parallel to it.

04 02 04 52 CDR Just a tad high?

04 02 04 54 LMP Yes, we're a tad high. I bet we're going to have a zero midcourse.

04 02 05 02 CDR Okay, Dave, we're ... for our first midcourse.

04 02 05 05 CMP Okay.

04 02 05 07 CDR Okay, and we've got you 52 seconds to get through your - do your short stuff.

04 02 05 18 LMP Okay, and I need my 8-minute mark.

04 02 05 53 LMP 8 seconds. 5, 4, 3, 2, 1 -

04 02 06 00 LMP MARK.

04 02 06 01 CDR That came right at it. Oh.

04 02 06 02 LMP And it's 12.2 and 98.

04 02 06 06 CDR Okay, Dave, I got our DELTA-V's for you.

04 02 06 09 CMP Go ahead.

04 02 06 11 CDR Plane X is minus 1.0; Y is 0 - is minus 0.3; and Z is plus 0.9.

04 02 06 23 CMP Boy, you'd sure argue - hardly argue with that?

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Tape 09-03601

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04 02 06 25 CDR No, I think I'll go ahead and burn them here. You got that, Rusty?

04 02 06 33 LMP Yes.

04 02 06 34 CDR Okay. Did you write them down at all?

04 02 06 36 LMP Yes.

04 02 06 37 CDR Okay, fine.

04 02 06 38 LMP Okay, I get the next ones here. Aft 1.4; left 0.4; and up 1.

04 02 06 49 CDR 0.1.

04 02 06 50 LMP 0.1, yes, I got it. Okay.

04 02 06 54 CDR Okay, we don't need that. I'm going to leave that.

04 02 06 57 LMP I'm going to turn up my ... here - -

04 02 06 58 CDR 21, ENTER; 18, ENTER, PRO.

04 02 07 15 LMP Boy, it reads zero.

04 02 07 19 CDR What does, your chart?

04 02 07 20 LMP UP/DOWN, yes. Aft 4 - I'll be with you in a second.

04 02 07 32 CDR VERB 77, ENTER. Okay, looks like I need them.

04 02 07 34 LMP Oops! Hey, the chart says you need some aft.

04 02 07 45 CDR Yes, so does this.

04 02 07 46 LMP Yes, but it says my - my chart says aft 6.

04 02 07 49 CDR Oh, goodness.

04 02 07 51 LMP So - -

04 02 07 52 CDR We're not going to do that - -

04 02 07 53 LMP No.

04 02 07 54 CDR - - We're going to do what the PGNS says here.  
Minus 1.6.

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Day 5 - Page 257  
Tape 09-03601

04 02 07 55 LMP Okay, are you going to ... okay.

04 02 08 00 CDR Waiting for the flashing 6085. Should be there right now. There it is; we're going to burn.

04 02 08 11 CDR Wait a second.

04 02 08 16 CDR Shoot.

04 02 08 17 LMP Oops. ... be careful of the - -

04 02 08 18 CDR ...

04 02 08 19 LMP Yes, be careful of the bounce.

04 02 08 23 CDR Okay.

04 02 08 25 LMP Looks good.

04 02 08 26 CDR That's good.

04 02 08 27 LMP Okay. PRO. Let me just make sure - -

04 02 08 28 CDR Okay, midcourse is complete.

04 02 08 29 LMP - - we want to go POO again, right?

04 02 08 31 CDR Yes, let's follow this checklist now just exactly the way it's supposed to go.

04 02 08 34 LMP Oh, hell, we don't want to go to POO - -

04 02 08 35 CDR We go to VERB 93 and then - -

04 02 08 38 LMP VERB 93, ENTER.

04 02 08 40 CDR And then ENTER, 37, 35.

04 02 08 44 LMP 35, ENTER. Okay.

04 02 08 53 CDR Okay, let me just stay here and make sure that first mark got in, and then I want to put VERB 76 in. It's taking something; let's see what it's going to spit out.

04 02 09 18 CDR Got it, okay?

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Tape 09-03601

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04 02 09 24 LMP Fine. VERB 76.

04 02 09 32 CDR We got a digital jump on our range tape.

04 02 09 36 LMP Did we?

04 02 09 37 CDR Yes, we are. We're getting big jumps, about 1000 feet.

04 02 09 41 LMP Ah ha. That's going to make it interesting.

04 02 09 46 CDR See it?

04 02 09 47 CDR Okay, we're about on, if you ought to get something on the - on the big cards.

04 02 09 54 LMP Right about - how about 56K?

04 02 09 58 CDR Okay.

04 02 09 59 LMP How much is it jumping? Oh, that much?

04 02 10 02 CDR Yes, figuring jumps to about the start - -

04 02 10 04 LMP There we go, 56, 49. Oh, my God.

04 02 10 13 CDR What are you on it?

04 02 10 17 LMP Right on it.

04 02 10 18 CDR Okay, I'll get it; I'll take it. Have you got some cameras we can take a picture of Gumdrop with?

04 02 10 26 LMP Yes. Can I turn up the lights? Is he bright enough?

04 02 10 32 CDR Yes, I'm - listen, I'm not even looking at him.

04 02 10 34 LMP Okay, good.

04 02 10 39 CDR Did we get the 93 in there? Yes, we did.

04 02 10 41 LMP Yes, we did. Yes.

04 02 10 45 LMP Ohhhh.

04 02 10 46 CDR We're standing by on the 17.

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Tape 09-03601

04 02 10 54 LMP Come on now, don't be stubborn. Right in there; there you go.

04 02 11 38 CDR Be careful you don't punch that through the window. That would ruin the whole day.

04 02 11 42 LMP Yes.

04 02 11 43 CC Spider, Gumdrop. This is Houston. We're about 1 minute LOS Carnarvon; we'll see you over the Huntsville in about 8 minutes.

04 02 11 49 CDR Okay, Houston. What did you decide about that post - or after I get up there? Should I go ahead and dock or not?

04 02 11 56 CC Okay, Jim, we're looking through here. There are a couple of things that we really would like to have, and that's some pictures taken of the ascent engine area. And we would like to get the rendezvous radar corona test.

( 04 02 12 11 CDR Okay, it depends on when I break out in the sunlight, what I can do for you.

04 02 12 16 CC Okay, very good.

04 02 12 18 CDR I don't want to go into darkness wondering how we're going to get the probes fixed.

04 02 12 23 CC Okay, we understand, and have you talked this over with Dave? We haven't heard his comments on - on the probe.

04 02 12 29 LMP ...

04 02 12 33 LMP Dave, can you hear him?

04 02 12 36 CDR Yes, he copied. Okay.

04 02 12 38 CMP Roger, Houston. Do you copy Gumdrop?

04 02 12 39 LMP Okay. Okay, 56; that was 44 and 564.

( 04 02 12 40 CMP Okay, and be ready to give me a GO for the PYRO ARM there too, please.

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Tape 09-03601

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04 02 13 02 LMP Okay, we're right on it.

04 02 13 04 CDR Okay.

04 02 13 08 LMP Okay, and I'm standing by for a 17-minute mark.

04 02 13 12 CDR Right, we've got a minute 50 to go to that.

04 02 13 15 LMP Right, okay, and I got the camera out, and it checked out. Okay, let me verify the settings on it, though.

04 02 13 29 CDR Where's that corona test.

04 02 13 31 LMP Okay, I did that.

04 02 13 51 CDR Who does the - who does the jet firing on this corona test?

04 02 13 59 LMP We do.

04 02 14 03 CDR Okay, it's running.

04 02 14 07 LMP Okay. Okay, 1 minute to the mark.

04 02 14 16 CDR Get back over here.

04 02 14 52 CDR 10 seconds.

04 02 14 53 LMP Okay, 5, 4, 3, 2, 1 -

04 02 15 00 LMP MARK.

04 02 15 01 LMP 17 minutes. Okay, that was - what - and 61 and what the heck was that? 35?

04 02 15 07 CDR That's 35, yes.

04 02 15 10 LMP 35.

04 02 15 11 CDR Okay, now we're standing by for - -

04 02 15 14 LMP ... 30, 63.3.

04 02 15 28 CDR 19 minutes, we do a PRO.

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Day 5 - Page 261  
Tape 09-03601

04 02 15 30 LMP Yes, we - we may need just a tad up. We've dropped a hair below the line.

04 02 15 36 CDR Okay.

04 02 15 37 LMP But just a hair. And I'll take one at - 18:30. We'll take another mark, and see - -

04 02 15 53 CDR ... radar there.

04 02 15 54 LMP - - what that looks like. Say again.

04 02 15 56 CDR Oh, that's kind of ricocheting around up there.

04 02 15 59 LMP What's that?

04 02 16 00 CDR The line-of-sight rate, that's all.

04 02 16 02 LMP Oh, yes. Well, they're steadier right now, as a matter of fact, than they should be, according to what Grumman was saying. They had some - a couple of characteristic oscillations - -

04 02 16 18 CDR Yes.

04 02 16 19 LMP - - on them that aren't showing up. Okay, 18:30. Can you give me a mark here?

04 02 16 28 CDR I can.

04 02 16 29 LMP Okay, great. What was that, 30 - -

04 02 16 32 CDR 30 000 - -

04 02 16 33 LMP - - 30 000 and 68.7. Okay, we're still right below the line.

04 02 16 51 CDR Okay. Maybe zero. Okay, you got a PRO coming up?

04 02 17 03 CDR Okay, Dave, we're PROing for our second midcourse.

04 02 17 06 CMP Okay.

04 02 17 12 LMP Hey, you see his thrusters firing again?

04 02 17 13 CDR Yes. Okay, when do we get your next one? At 20, isn't it?

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04 02 17 18 LMP Yes at 20. 30 seconds, okay. I got that.

04 02 17 35 LMP Okay.

04 02 17 37 CDR Want my DELTA-V's for my next midcourse, Dave?  
Gumdrop?

04 02 17 44 CMP Yes, go ahead.

04 02 17 46 CDR Okay, plus 0.2, minus 0.9, minus 1.8. Here, we  
got 10 seconds to get this thing.

04 02 17 53 LMP Okay.

04 02 17 54 CMP Got them.

04 02 17 59 LMP 5, 4, 3, 2, 1 -

04 02 18 00 LMP MARK.

04 02 18 01 LMP Okay, that's 4 - 49. What was that, 20 - 25 4 and  
49 - -

04 02 18 12 CDR 49 feet per second. Okay, did you get that stuff?

04 02 18 18 LMP Just 1 minute - 73.37. Okay, and that's FORWARD  
1.8, LEFT 0.9 and nothing. Okay, go.

04 02 18 36 CDR Okay. What - -

04 02 18 37 LMP - - talk about nominal.

04 02 18 39 CDR We're - bypass the AUTO maneuver. Okay, I'm going  
to leave this program.

04 02 18 45 LMP Okay.

04 02 18 46 CDR I'm going to go to 41; I'm going to ENTER that;  
and I'm going to go past that; and I'm going to  
PROCEED past that. While I'm on that, do a VERB -

04 02 19 07 LMP There's a nothing UP/DOWN again.

04 02 19 09 CDR Yes. Okay, so ENTER. We're just sort of putting  
in what we took out last time.

04 02 19 24 LMP ...

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Day 5 - Page 263  
Tape 09-03601

04 02 19 25 CDR ... not going to call - -

04 02 19 27 LMP I got a FORWARD 1.

04 02 19 28 CDR Okay.

04 02 19 34 LMP Which is close to what the PNGS says.

04 02 19 37 CDR This shows a foot out of plane, a foot per second out of plane.

04 02 19 41 LMP Yes.

04 02 19 47 CDR Okay, about 15 seconds to go, Dave.

04 02 19 51 CMP Roger.

04 02 20 03 CDR Okay, thrusting. Wait a second.

04 02 20 14 LMP Okay, there are big bounces here, by the way.

04 02 20 15 CDR Yes. Okay, that's good. Okay. They're essentially zero.

04 02 20 22 LMP ... P00.

04 02 20 30 CMP What kind of range rate do you have?

04 02 20 32 LMP I - and 18 700 feet, right now, and 42 feet per second.

04 02 20 38 CMP Roger, I've got 3.0 miles at 43 feet per second.

04 02 20 42 LMP Great.

04 02 20 44 CMP What's your pitch angle?

04 02 20 48 LMP It's about 86 degrees - something like that.

04 02 20 52 CMP Okay.

04 02 21 01 LMP Okay, let me look ahead here and see if I can figure out what's going on. Here, let me call the VERB 62 for you. Okay?

04 02 21 16 CDR Okay.

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Tape 09-03601

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04 02 21 17 LMP 40 feet per second, right on the money. Did you get the 90 yet?

04 02 21 25 CDR No, not the 90 yet. We're just a tad off nominal. The - the last time ... - -

04 02 21 29 LMP You're on 90 if you pitch UP there.

04 02 21 31 CDR ... the ORB RATE ball isn't right.

04 02 21 33 LMP Yes.

04 02 21 35 CDR Dave, did you hear them say they wanted to get some pictures of the ascent engine area?

04 02 21 39 CMP Roger. I got that. Thank you.

04 02 21 40 CDR Okay.

04 02 21 41 LMP Hey, he's in sunlight.

04 02 21 45 CDR Oh, I see you out there coming in the sunlight.

04 02 21 48 CMP Great.

04 02 21 50 CDR I see the biggest, ... , friendliest star I've ever seen.

04 02 21 54 LMP Do you want the DAP where it is?

04 02 21 55 CDR Yes, I do.

04 02 21 56 LMP Okay. Let me look ahead to this corona test here.

04 02 22 01 CC And Spider, Gumdrop. We are copying you through the Huntsville - next 5 minutes.

04 02 22 05 CDR Okay.

04 02 22 07 LMP And let me know when you want P47, Jim.

04 02 22 10 CC And, Gumdrop, in regards to your last request, we have no TM here at the Huntsville in regards to that PYRO ARM.

04 02 22 20 CMP Roger. Understand.

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Tape 09-03601

04 02 22 42 CMP Houston, Gumdrops.

04 02 22 50 CC Go, Gumdrops. Houston.

04 02 22 52 CMP Roger. We're going to ... here. The only thing I can think of on that probe, is that my fingers slipped off the switch before it got all the way out. Other than that, I just can't think of a thing.

04 02 23 04 CC Roger. That's about the only thing we can come up here with, - that you didn't hold the switch long enough, Dave. I guess - how do you feel about it? Do you think it's anything - any problem?

04 02 23 22 CMP No, I really don't. I went back to see if it had gone all the way out to retract, and I had the barber poles, which said they had extended all the way. Then I want up to extend again and it dropped right off.

04 02 23 36 LMP Jim.

04 02 23 37 CDR Yes.

04 02 23 38 LMP It looks to me as - if we just move right on through this, we're going to do the whole damned thing anyway.

04 02 23 44 CDR Okay.

04 02 23 46 LMP As long as we stay in-plane on the ball, we just do the VERB 49 maneuver, do pitch up 90 degrees, let him take the pictures. We can set up the rendezvous radar while he's taking the picture, and pitch right back down again. And that does the corona test.

04 02 23 57 CDR Okay, fine.

04 02 23 53 LMP Okay. Tell me when you want the P47.

04 02 24 02 CDR You can bring it up now. Hey, let me get VERB 77 in there first.

04 02 24 06 LMP Okay.

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04 02 24 09 CDR Dave, I think what we'll do is come on up and stop out in front there; pitch over so you can look at our ascent engine, then pitch back around. And then we'll start docking.

04 02 24 19 CMP Okay.

04 02 24 21 LMP Okay, if you want to follow me through this one I'll - I'll just call out the DSKY calls for you.

04 02 24 27 CDR Yes.

04 02 24 38 CMP What kind of range do you have now?

04 02 24 39 CDR I have 9800 feet and a range rate of 32.5 feet per second.

04 02 24 44 CMP Thank you.

04 02 24 46 CDR I am just a little bit of line-of-sight rate up.

04 02 24 50 CMP Roger. I've got just about 9000 feet and 33.

04 02 24 55 CDR Okay.

04 02 25 01 LMP Okay, I'll let you know as soon as it comes up, Jim.

04 02 25 03 CDR Okay, because I'm going to start tossing them out here pretty soon.

04 02 25 05 LMP Okay. It's probably just about 10 more seconds. Okay, there it is.

04 02 25 18 CDR Okay. Okay, I'm on my line-of-sight rate, Dave.

04 02 25 24 CMP Okay.

04 02 25 38 LMP A little more up. Oh, you can see it there.

04 02 25 40 CDR Yes.

04 02 25 44 LMP Okay, I'm going to call the VERB 62 here. Okay.

04 02 26 04 CDR Shoot, we're going to go through the first braking gate without braking, too.

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Tape 09-03601

04 02 26 07 LMP

Yes, beautiful. Okay, I'm going to get my Hasselblad ready. 11 at a 250th.

04 02 26 20 CDR

Okay.

04 02 26 25 LMP

Once again you're going to get the good pictures on your side.

04 02 26 27 CDR

That's right; that's right.

04 02 26 29 LMP

Okay. I'll tell you what, you want to do that while he stationkeeps, and I'll just set up the DAP and go - -

04 02 26 32 CDR

Okay. Oh, gees, what was that! - What in ... was that - -

04 02 26 33 LMP

- - on that corona test.

04 02 26 34 CDR

- - We just threw a great big hunk of junk out of our thrusters, there.

04 02 26 37 LMP

Really, this isn't the time to be messing with that kind of thing. Boy, look at that stuff coming out from around him when he fires his thrusters; it's amazing!

04 02 26 50 CDR

Okay, just went through 6000 feet at 30 feet per second.

04 02 26 53 CMP

Okay.

04 02 26 57 LMP

Okay, I think I'm going to turn the camera on. How much more time we got - 32.5 minutes at 4 -

04 02 27 03 CDR

What have we got, the wide angle - You won't see a thing here, Rusty.

04 02 27 06 LMP

Wow, you're right. This one did too. I'm going to take a picture of the thruster out there.

04 02 27 35 CDR

Okay, he's coming now. Okay, Dave, I can see the shape of the spacecraft now for the first time.

04 02 27 41 CMP

Good.

04 02 27 54 LMP

Okay, 6 frames a second. Okay, here it goes.

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04 02 28 07 CDR Okay, tape, if you're running, I'm at - still at 30 feet per second, at 3500 feet. Hey, we look closer than that, don't we? Okay, Dave, I'm at 3000 feet; I'm braking down 20 feet per second.

04 02 28 29 CMP Okay.

04 02 28 34 LMP Boy, look at all that stuff, would you.

04 02 28 41 LMP 24, 23, 21, 20.

04 02 28 49 CDR Okay, I'm 20 feet per second now, at 2400 feet.

04 02 28 54 CMP Alrighty. I got you a little line-of-sight here.

04 02 29 07 CDR Yes, me too. Okay, I'm coming up on 1500 feet; I'm braking down to 10 feet per second.

04 02 29 29 CMP Okay.

04 02 29 44 CDR Okay, there we are; we're 10 feet per second at 1500 feet. Boy, are you bright, Dave. I'm not sure I'm going to be able to see to dock with this COAS I have.

04 02 30 05 LMP Just a little up. Beauty! This is running just like the simulator.

04 02 30 10 CDR Yes, isn't it. I just hope the docking goes like it.

04 02 30 14 LMP Let's hope it doesn't. (Laughter) As I recall, the simulator didn't work well.

04 02 30 26 CDR See, that clock isn't doing anything any more is it?

04 02 30 29 LMP No, it's just counting up from - -

04 02 30 31 CDR Okay, why don't we use 30 minutes - I want to know how much daylight I have left here.

04 02 30 35 LMP Okay.

04 02 30 38 CDR Okay, I'm at 950 feet, 10 feet per second.

04 02 30 40 CMP Okay, that looks pretty good.

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Day 5 - Page 269  
Tape 09-03601

04 02 30 49 CC Spider/Gumdrop, Houston. We've got you through Hawaii now good and solid, and I copied your last transmission; sounds great.

04 02 30 55 CDR Thank you.

04 02 31 05 CDR Takes a little longer to take that DELTA - -

04 02 31 07 CMP ... just a little yellow dot.

04 02 31 08 CDR Yes, they're really throwing a lot of stuff out. Okay, we're 5 feet per second, about 610 feet.

04 02 31 23 CMP Okay. But you're upside down again!

04 02 31 30 CDR Hey, I just thinking, one of - isn't right-side up.

04 02 31 38 CDR ... that contraption's hanging out all over. Hold this just a second.

04 02 31 44 LMP ... just a second. That's show biz.

04 02 31 45 CDR Alrighty.

04 02 31 55 LMP Wind - are you going to wind it?

04 02 31 59 CDR Okay.

04 02 32 15 CDR Okay, I have us about 370 feet.

04 02 32 19 CMP Okay. Looks closer than that.

04 02 32 21 CDR Yes, doesn't it?

04 02 32 33 CDR Okay, you got your camera out so you can take a picture of my bottom here?

04 02 32 37 CMP Roger. Why don't you come all the way in and stop and then pitch over?

04 02 32 40 CDR Yes, that's what I'm going to do. I'm going to come on in and stop. And then you're going to take over stationkeeping, and I'll pitch around.

04 02 32 47 CMP Okay.

04 02 33 09 CMP Give me a mark, next time you turn your thrusters on.

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Tape 09-03601

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04 02 33 11	CDR	Okay. 3, 2, 1 -
04 02 33 13	CDR	MARK.
04 02 33 17	CMP	Thank you.
04 02 33 21	LMP	Hey, you're going up a bit, yes?
04 02 33 23	CMP	How does that sports car handle, Jim?
04 02 33 25	CDR	Pretty nice.
04 02 33 49	CDR	Okay, Davey, it says 100 feet on the radar tape. It looks a little closer than that to me, but what do you say we stop here?
04 02 33 57	CMP	Okay. That's a good idea.
04 02 34 04	CDR	Okay, I'll get it stopped and stabilized, and then I'll give it to you.
04 02 34 27	CDR	Okay. That looks pretty good to me.
04 02 34 29	CMP	Okay, good.
04 02 34 30	LMP	Okay, here you go.
04 02 34 33	CDR	Let me take a couple of pictures of your nose, and then I'll start pitching around.
04 02 34 36	LMP	Okay, I'll set up this stuff here.
04 02 34 42	CMP	Okay. You tell me when I've got it.
04 02 34 45	CDR	Okay, babe. You've got it now.
04 02 34 47	CMP	Alrighty. I got it.
04 02 34 52	CDR	Okay - -
04 02 34 53	CDR	Go - go ahead - I - I got a lot of work to do here.
04 02 34 55	CDR	Okay.
04 02 35 04	LMP	Come on POO. Get in there, damn it.
04 02 35 13	CDR	I don't even see you in there, David.

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Day 5 - Page 271  
Tape 09-03601

04 02 35 15 CMP Oh, I'm here.

04 02 35 16 LMP Which side is he on - he's on - he's on your side.

04 02 35 22 CDR Yes.

04 02 35 23 CMP I've been waiting for you to bring that good water back.

04 02 35 25 LMP Okay, here we go.

04 02 35 37 CDR Oh, shoot ... OPS.

04 02 35 44 LMP ... OPS. Okay, we're going to start the pitch here at 355 and 90 - -

04 02 35 48 CDR Are we going to do an AUTO maneuver?

04 02 35 49 LMP - - is - yes. VERB 49, it's going to be - -

04 02 35 52 CDR Wait a second - -

04 02 35 53 LMP - - 00 and 85. Okay, VERB 49, ENTER; VERB 25 ENTER; plus C - plus 00 - oops, CLEAR. Plus 085 00, ENTER; plus 0000 ... ENTER 12 - Okay, you ready.

04 02 36 20 CDR Okay, let me - let me talk to him. Okay, Dave, we're going to start on AUTO maneuver here, and we're going to pitch up. And then you can take a picture of our bottom.

04 02 36 24 CMP Alrighty.

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Tape 09-03601

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04 02 36 25 CDR Okay, here we go, 2 degrees per second.

04 02 36 27 LMP No, it's a half.

04 02 36 28 CDR Okay, half a degree per second.

04 02 36 40 LMP ... Okay. Okay, now let's start getting the rendezvous radar ready.

04 02 36 49 CDR Okay, what do I have to do with this?

04 02 36 51 LMP Oh hell, we can't do that until the damn - That's another extended verb. Okay, let's - let's put it in SLEW and break lock by going up.

04 02 37 04 CDR Okay.

04 02 37 13 LMP Shoot, it's going to stay locked on no matter what you do, I think.

04 02 37 15 CDR Yes.

04 02 37 17 LMP Okay.

04 02 37 20 CMP Upside down a little bit at ...

04 02 37 25 CDR Yes, I'm - I wasn't looking at you.

04 02 37 27 LMP Okay, if we get up here, I'm going to - We're going to finish up the AUTO maneuver and change the DAP to 2012 and set up the rendezvous radar, but I don't know how the hell we're going to get it to designate down there, because if it won't break lock - It's going to be difficult to - to get the job done.

04 02 38 28 CDR Well, let's see, what do we have to do here?

04 02 38 32 LMP Okay, like I said, as soon as we get up there - -

04 02 38 34 CMP ... like a big black hole underneath you, Hou - Spider.

04 02 38 39 LMP Okay, take a picture of it I guess; we're at TPF 18 where we're going to - -

04 02 38 41 CMP ... why don't you just keep going the way you're going.

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Day 5 - Page 273  
Tape 09-03601

04 02 38 47 CDR Okay.

04 02 38 50 LMP You've got another 20 degrees to go.

04 02 39 04 CDR What we have to do - All we have to do is put the shaft and trunnion someplace?

04 02 39 08 LMP Yes, at 0 and 300. Why don't you try to break on that thing after we get up here while I reload the DAP here. We ought to be able to slew the thing up and get it out of there. God, he's putting out so much signal, we don't know what to do.

04 02 39 30 CDR Yes.

04 02 39 33 LMP Okay, there we are. We're in hold. Okay, VERB 48, ENTER; VERB 21, ENTER; 2012 - -

04 02 39 42 CMP Okay, I can see your injector, as a matter of fact; I can even see the taper right now.

04 02 39 47 CDR Okay, fine. Why don't you take a couple of pictures of it, and we're going to maneuver back around.

04 02 39 50 LMP This one is going to be faster.

04 02 39 52 CDR This will be 2 degrees per second - -

04 02 39 53 LMP Okay ... 41, NOUN 72, ENTER. Let's try it.

04 02 39 57 CDR Yes, go ahead.

04 02 39 58 CDR Let's punch it in there, designate, then if it doesn't go, the heck with it.

04 02 40 02 LMP Plus 30000. Okay.

04 02 40 05 CMP How fast do we do this one?

04 02 40 06 CDR Two degrees a second. -

04 02 40 07 LMP ENTER; looks like it - PRO. VERB 16, NOUN 72, ENTER. It's not going, okay?

04 02 40 18 CDR Okay, the heck with it.

04 02 40 19 LMP Hell with it?

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Tape 09-03601

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04 02 40 20 CDR Yes, the hell with it.

04 02 40 21 LMP Stand by, let me see what I want to do with this. VERB 44, ENTER. Okay, now I want to go VERB 49 and pitch right back down there again.

04 02 40 31 CDR Yes.

04 02 40 32 LMP VERB 49, ENTER; okay, VERB 22, ENTER; plus all zips. No, I want to do that one to go plus 35500.

04 02 40 45 CMP Give me a ..., will you?

04 02 40 46 CDR Okay.

04 02 40 47 LMP Okay, PRO; okay, want to tell him 3, 2, 1, MARK?

04 02 40 52 CDR 355, you know.

04 02 40 53 LMP Okay - get this - Why don't you put the - the signal strength on there anyway.

04 02 40 57 CDR The transmitter power?

04 02 40 58 LMP The transmitter power, yes.

04 02 40 59 CDR Okay, we're going to start the pitch down maneuver now, Dave. Are you ready?

04 02 41 03 LMP Go.

04 02 41 04 CDR 3, 2, 1 -

04 02 41 05 CDR MARK.

04 02 41 07 LMP Okay, the deadband is going to go out first and that is going to ... Okay, the signal strength is 2.7.

04 02 41 14 CDR Houston, for your information, we could never get the radar to unlock, so we couldn't - -

04 02 41 18 LMP We want to see if it changes there - -

04 02 41 24 CC Roger. Understand. The rendezvous radar stayed locked.

04 02 41 29 CDR Roger.

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Day 5 - Page 275  
Tape 09-03601

04 02 41 32 LMP Shoot, it's not changing at all.

04 02 41 35 CDR No. It's not firing either.

04 02 41 36 LMP Okay, well, wait until it thrusts - when the thrusters fire is when we are liable to have it happen. Like right now.

04 02 41 55 LMP No - no change at all? Still 2.7.

04 02 41 57 LMP Okay, let's get out of here.

04 02 42 00 LMP PGNS RENDEZVOUS RADAR, OPEN.

04 02 42 01 CDR PGNS RENDEZVOUS RADAR, OPEN. RENDEZVOUS RADAR, OPEN.

04 02 42 07 LMP Okay, you got both of those. Okay, VERB 44, ENTER. Okay, that's done. PRO. Okay, now what DAP ... for the docking?

04 02 42 14 CDR I want 00002.

04 02 42 15 LMP Okay, VERB 48, ENTER; VERB 21, - -

04 02 42 20 CDR You did get VERB 21.

04 02 42 21 LMP VERB 21, ENTER; - -

04 02 42 23 CMP ... get set up.

04 02 42 24 LMP - - 2, ENTER - -

04 02 42 25 CDR Roger, get set up and let's get on with ... docking.

04 02 42 26 LMP - - PRO; PRO. Go. Okay, that's narrow deadband.

04 02 42 29 CMP ... to stationkeep on me?

04 02 42 30 LMP I got it.

04 02 42 31 CMP You got it.

04 02 42 35 LMP Hey, why don't you stationkeep for a minute -

04 02 42 36 CMP ... okay? Don't worry about fuel.

04 02 42 40 CC Houston, standing by for your LOGIC and PYRO.

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Tape 09-03601

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04 02 42 46 CMP Roger, Houston. Thank you. LOGIC on my MARK.  
3, 2, 1 - Stand by. Okay, 3, 2, 1 -

04 02 42 55 CMP MARK.

04 02 42 57 CC Roger. Copy. PYRO ARM.

04 02 43 10 CMP Roger, understand GO for PYRO ARM. ...

04 02 43 22 CDR Oh shoot. Would you believe it's not even on now?

04 02 43 24 LMP You got the overhead?

04 02 43 26 CDR Yes. ... looked like it gave you ... the earth.  
Oh, there it is.

04 02 43 30 CDR Oh, there it is. Holy Christmas.

04 02 43 34 CMP Houston, this is Gumdrops here. I've got the FULL-  
EXTEND/RETRACT switch in RETRACT. I've got a couple  
of barber poles.

04 02 43 44 LMP Oh shoot.

04 02 43 47 CMP Should have a couple of gray, I believe.

04 02 43 50 CC Roger, Gumdrops. We copy.

04 02 44 03 LMP I wonder what that means?

04 02 44 04 CDR That means we may not get back on it. Okay, I got  
it again.

04 02 44 09 LMP Okay, you got it?

04 02 44 13 LMP Why did they call our barber pole, Dave?

04 02 44 16 CMP Well, when I checked them for full extension before  
they were barber poles, and then when I went back  
and pushed it to EXTEND, again, to get you off,  
they went gray, dropped off.

04 02 44 34 LMP Then they say they're barber pole now, huh?

04 02 44 38 CMP That - that's right. Okay, now I went - now I've  
cycled again up to EXTEND and now back to RETRACT,  
and I've got two gray.

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Tape 09-03601

04 02 44 50 CDR Okay.

04 02 44 51 CMP So I think we're alright now.

04 02 44 52 CDR Yes, let's get on with it and see if we really are.

04 02 44 55 CMP Okay, you want to try an automatic retract?

04 02 44 57 CDR Let's try automatic retract just like we talked about it?

04 02 45 02 CMP Okay.

04 02 45 04 CDR Why don't you do your roll. And when you do that then I'm - How's the sun? Will you be able to dock on top of me, if I can't see you?

04 02 45 13 CMP I am in good shape sunwise.

04 02 45 14 CDR Okay, fine.

04 02 45 16 CMP Maybe we ought to not try an automatic retract because what if I - ... afraid it will be if I hit the RETRACT now, it might go.

04 02 45 24 CDR Okay, fine that's a good idea. Excellent idea, Let's leave it where it is and when I punch in, you call me in.

04 02 45 31 CC Spider, Houston.

04 02 45 33 CDR Go ahead.

04 02 45 34 CC Roger, would you modify your DAP LOAD prior to this docking?

04 02 45 39 CDR Roger, the DAP's four balls 2.

04 02 45 42 CC Okay, thank you very much.

04 02 45 48 CMP Okay, and I'm going to go VERB 76, ENTER - ENTER when you tell me to go to FREE.

04 02 45 54 CDR Right.

04 02 45 55 CMP Houston, Gumdrops.

04 02 45 57 CC Go, Gumdrops.

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Tape 09-03601

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04 02 45 59	CMP	I think we're okay on the probe now. Do you concur?
04 02 46 04	CC	Roger. It sounds like it's okay now, Dave. Yes, we can hear it.
04 02 46 08	CMP	Okay.
04 02 46 14	CDR	Okay.
04 02 46 15	CMP	Gumdrop, Spider, I'll stationkeep while I turn around.
04 02 46 19	LMP	Why don't you do your roll first, Dave? So that I can get that - that window over on the other side.
04 02 46 25	CMP	Rolling left 60.
04 02 46 26	CDR	Roger.
04 02 46 37	LMP	Shoot, let me get that camera back. Where the hell's the camera?
04 02 46 38	CDR	It's in here. Why don't you turn the movie camera on?
04 02 46 41	LMP	That's all used.
04 02 46 42	CDR	It's all used?
04 02 46 43	LMP	Yes.
04 02 46 44	CDR	There's a good - pictures now.
04 02 46 46	CDR	Boy, they sure are.
04 02 46 48	LMP	Sun's out the window now, too.
04 02 46 55	LMP	Can't get that God damn thing off of there - Sure is - Oh boy, we're going to come over the earth.
04 02 47 14	CDR	Yes, we waited too long.
04 02 47 19	CDR	You ever going to be able to see that CCAS?

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Day 5 - Page 279  
Tape 09-03601

04 02 47 37 LMP I don't even know where the docking light is to look for it.

04 02 47 46 CDR I think he means the docking target.

04 02 47 49 LMP Oh, yes, maybe he does. There it is; it's on.

04 02 48 01 CDR Yes. Okay, I've got it, Dave, very faintly.

04 02 48 06 CMP Stand by.

04 02 48 26 CMP Okay, all set. Tight deadband, the whole works.

04 02 48 29 CDR Okay, babe. You stationkeep, and I'm going to pitch over.

04 02 48 33 CMP Okay.

04 02 48 37 LMP Okay, you want to go to -

04 02 48 39 CDR ... attitude hold for one thing.

04 02 48 42 LMP Down 10 degrees, so you've got to go to 265. I can tell you when have gone exactly 90.

04 02 48 46 CDR Okay, fine.

04 02 49 05 LMP Damn it, come on. Shoot.

04 02 49 19 CMP I've still got the target.

04 02 49 22 CDR Good.

04 02 49 29 LMP Oh, the hell with it. I'll slip it down here. Okay, you've got 15 degrees to go. Okay, you got 5 degrees to go. You've rolled a bit; you right there. Yes, 1 more degree. Okay, that's good on the yaw - -

04 02 49 52 CMP Looking better, huh?

04 02 49 53 LMP - - and a roll right.

04 02 49 54 CDR Not yet.

04 02 49 55 CMP Okay.

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Day 5 - Page 280  
Tape 09-03601

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04 02 49 56 LMP Okay, a couple more degrees there and about another 2 degrees at pitch.

04 02 50 04 CDR Okay, I can't see my COAS against you right now; let me get up closer.

04 02 50 09 CMP Alright.

04 02 50 10 LMP Here let me get this window shade up for you.

04 02 50 11 CMP ...

04 02 50 12 LMP I've got it.

04 02 50 13 CMP Alright.

04 02 50 15 LMP Okay, I got the window shade up for you. Shoot, I don't even know where that - Oh, there it is.

04 02 50 32 CDR Oh, I mangled my helmet, so I can't even use it. Oh, I've got to look through the top of my helmet, and have I beat it up!

04 02 50 40 CMP You've got to come back quite a ways to your rear. Okay, easy does it. That's too far.

04 02 50 56 CDR Yes, I know.

04 02 51 04 LMP Okay, let me -

04 02 51 05 CMP ...

04 02 51 06 CDR Man, it's not even going the right direction.

04 02 51 09 LMP Hey, I think it's the ATTITUDE HOLD. Jim, - -

04 02 51 11 CDR Yes.

04 02 51 12 LMP - - that's kind of faking you. We know we're about 5 or 10 feet out.

04 02 51 18 CDR Yes.

04 02 51 24 LMP We're probably going to get a heater light here.

04 02 51 26 CDR Yes.

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Day 5 - Page 281  
Tape 09-03601

04 02 51 28 LMP Well, don't let that bother you.

04 02 51 33 CMP Houston, Gumdrop. What time you got there?

04 02 51 39 CC 99:15, Gumdrop.

04 02 51 43 LMP Okay, we got - -

04 02 51 44 CMP We got about - -

04 02 51 46 LMP - - 24 minutes.

04 02 51 47 CMP - - 25 minutes ... how many.

04 02 51 53 CDR I just can't even see the COAS, Dave. I don't know exactly where you are with respect to it.

04 02 51 56 CMP Okay, want me to do it?

04 02 52 00 CDR No, let me work my way in here a little closer.

04 02 52 02 CMP Okay.

04 02 52 07 LMP Okay, that attitude's just right.

04 02 52 17 CDR I can't even see it.

04 02 52 36 LMP You may have to actually get her right on the target before you can see it, being right next to it.

04 02 52 41 CDR Yes.

04 02 52 55 CDR I can't see it. There it is, way over there now.

04 02 53 20 LMP How's it controlling?

04 02 53 21 CDR It's okay. I haven't done any attitude control yet.

04 02 53 24 LMP No, uh huh. It looks real good.

04 02 53 26 CDR Sorry to say I haven't had to do any. That's why it's controlling okay.

04 02 53 28 LMP Yes.

04 02 53 29 CDR Wait until I do something.

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04 02 53 30 LMP Don't do any (laughter).

04 02 53 33 CDR Oh, man, I just can't see the target or the COAS.  
Oh, there it is over there now.

04 02 53 53 CDR Just can't see it.

04 02 54 05 CDR Just can't see it, let me get in a little closer.

04 02 54 09 CMP You're coming fine. Keep coming easy like that.  
Looks like you're coming from an angle, but you're  
coming in on the right attitude. Better go for-  
ward and to your right a little bit, relative to  
your body.

04 02 55 14 CMP Doing fine. That's it.

04 02 55 24 CDR Aw, that doesn't look like it to me.

04 02 55 28 CMP No, you've got to come in from an angle anyway,  
so you're doing good.

04 02 55 31 LMP How close are you?

04 02 55 34 CDR I don't know.

04 02 55 35 CMP You're left about 2 degrees.

04 02 55 47 CDR I just can't see the darn COAS. I can't tell  
what my attitude is.

04 02 55 51 CMP Yes.

04 02 56 15 CDR Okay, I'm lined up in translation, but I can't  
tell what my attitude is, Dave. If I don't - if  
I don't see it - Oh, there it is, there.

04 02 56 24 CMP Now you're coming in. That ... much better. There  
you go. I think you got a handle on it now.

04 02 56 34 CDR No, it keeps disappearing.

04 02 56 38 CMP Okay, now you're looking pretty good.

04 02 56 59 CMP Okay, you're moving into the boundary now. You're  
inside the capture boundary now.

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Day 5 - Page 283  
Tape 09-03601

04 02 57 13 CMP You're okay. Looking good.

04 02 57 21 CDR Okay, I can see it now. This thing's really sporty.

04 02 57 34 CMP It sure is. I can tell. You're looking good. Keep it coming. You're almost there.

04 02 58 08 CMP Okay, you're about there.

04 02 58 42 CMP I have capture.

04 02 58 43 LMP Very good.

04 02 58 44 CDR Free.

04 02 58 45 LMP Free.

04 02 58 46 CMP You're lined up.

04 02 58 47 CDR Okay, why don't you do it? I can't tell where it is. We're free now.

04 02 58 51 CMP Good job.

04 02 58 55 CDR Boy, we need a new COAS. This isn't a docking maneu - -

04 02 58 58 CC Good show, Spider.

04 02 59 00 CDR It's an eye test.

04 02 59 03 LMP Your onboard fuel reading 65 and 65.

04 02 59 06 CDR 55.

04 02 59 08 LMP Make it 55 and 55.

04 02 59 10 CC Roger, reading 55/55. Thank you, Rusty.

04 02 59 15 CMP RETRACT.

04 02 59 16 CDR We get the latches?

04 02 59 20 CMP Hang on.

04 02 59 21 CDR We got those latches, baby!

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Tape 09-03601

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04 02 59 22 LMP	Oh, did that sound good!
04 02 59 25 CDR	Whooo, I haven't heard a sound like that in a long time.
04 02 59 30 CMP	That was a pretty nice docking.
04 02 59 31 CDR	God dag, that wasn't a docking; that was an eye test.
04 02 59 33 LMP	Okay.
04 02 59 36 CMP	Okay, Houston, we're locked up.
04 02 59 40 CC	That sounds like you passed a 20-10, Jim, that sounded real beautiful. Good show.
04 02 59 45 LMP	Let's see something here. Just for fun (laughter). Whew! Range, range rate, not bad.
04 03 00 07 CMP	... Spider ... free ... you're free - -
04 03 00 10 CDR	Roger.
04 03 00 11 CMP	- - proceed up through the tunnel here and get you squared away.
04 03 00 15 CDR	Okay, Dave, we'll start getting ready for the un-manned APS.
04 03 00 22 CMP	Okay. Why don't you take a break for awhile?
04 03 00 24 CDR	No, we still got a lot to do. Man, when I take a break, I'm going to bed for 3 days.
04 03 00 29 CMP	Roger.
04 03 00 31 CDR	Houston, did you get that? (Laughter)
04 03 00 32 CC	Roger, Spider. Houston copies.
04 03 00 37 LMP	Here, you want to stick these in that center pocket?
04 03 00 40 CDR	Yes, let's take all - -
04 03 00 41 CC	... three days off.

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04 03 00 45 CDR Here. What's that? Saturday and Sunday and Christmas? Let's take and put all the -- all the data --

04 03 00 55 CC That was a hard day's work; and it looked real good, troops.

04 03 01 00 CDR Thank you, Smokey, and, hey -- Ah, shoot.

04 03 01 05 LMP Almost sure --

04 03 01 06 CDR Smokey, you still there?

04 03 01 07 CC Yes, and we've still got you for about another minute here.

04 03 01 10 CDR Okay, well listen, I hope the whole world's listening, but I -- I tell you, I think we got the greatest set of flight controllers that we -- that there are -- is any place that we -- can be found. I know I'd like to thank you all, and I'm sure the rest of the guys up here would too.

04 03 01 25 CC Roger, Spider, we ...

04 03 01 40 LMP What do I hear?

04 03 01 42 CDR The S-band break-up.

04 03 01 44 LMP No, I don't think so. Yes, it is, but it's a funny sound. Let's put that data in the center ...

04 03 01 55 CDR ... (Cough) Hold -- hold it there just a minute.

04 03 01 57 LMP Okay.

04 03 01 58 CDR Gee, I don't -- I was leaning my adam's apple up against my neckring.

04 03 02 10 LMP Well, you got it over your nose, Jim. You're not going to get out of it. Hey, is that what you call a nominal rendezvous? Holy smoke! Except for the undocking.

04 03 02 28 CDR Yes.

04 03 02 29 LMP Here you go. Oop, oop, oop. Go ahead.

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04 03 02 42 CMP Spider, I'm going to put it in a wide deadband hold here, so we don't lose the platform.

04 03 02 49 CDR That a boy. Say, I wonder if we ought to do a wide deadband attitude hold? No.

04 03 02 54 LMP What are we going to do with all that fuel?

04 03 02 57 CDR Use it for S - service module RCS deorbit, babe. You're not on the ground yet.

04 03 03 02 LMP No, but we got - we got enough for two of those.

04 03 03 06 CDR Well, we've still got 5 more days. I wonder if it'll control?

04 03 03 11 LMP Hey, no. There's no docked DAP in this.

04 03 03 12 CDR ... CSM.

04 03 03 14 LMP No, but that's only with descent stage.

04 03 03 17 CDR Oh.

04 03 03 18 LMP I forgot about that, as a matter of fact. I'll tell you what. Let's take these clips back for souvenirs.

04 03 03 26 CDR Yes. We ought to take the whole light.

04 03 03 29 LMP Yes, take the COAS. Take the radiation survey viewer. Let's take back some souvenirs. If it's not screwed down, (laughter) take it back.

04 03 03 38 CDR Wait until we start to use our parachutes, too.

04 03 03 41 LMP Our what? Oh, yes.

04 03 03 44 CDR Turn the tape off.

04 03 03 46 LMP Okay, tape coming off.

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