APOLLO 15
COMMAND MODULE
ONBOARD VOICE
TRANSCRIPTION
(U)
Classification changed to U
By authority of DSC Security Class. Officer
Date 11/23 - 2/10/71
RECORDED ON THE
DATA STORAGE EQUIPMENT
(DSE)

AUGUST 1971

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

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

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

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

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

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

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

Speakers in the transcript are identified as follows:

Spacecraft:

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<th>Abbreviations</th>
<th>Identifiers</th>
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<tr>
<td>CDR</td>
<td>Commander</td>
<td>David (Dave) R. Scott</td>
</tr>
<tr>
<td>CMP</td>
<td>Command module pilot</td>
<td>Alfred (Al) M. Worden</td>
</tr>
<tr>
<td>LMP</td>
<td>Lunar module pilot</td>
<td>James (Jim) B. Irwin</td>
</tr>
<tr>
<td>SC</td>
<td>Unidentifiable crewmember</td>
<td></td>
</tr>
<tr>
<td>MS</td>
<td>Multiple speakers</td>
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</tbody>
</table>
Mission Control Centers:

CC    Capsule communicator (CAP COMM)
LCC   Launch control center

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

The Apollo 15 mission was flown July 26 to August 7, 1971; lift-off occurred at 13:34:00.79 G.m.t. (9:34:00.79 a.m. e.d.t.) on July 26. The CM was designated Endeavour and the lunar module was called Falcon.
DAY 1

-00 00 00 10 LCC 10, 9, 8, 7, 6, 5 -
-00 00 00 04 LCC IGNITION, 3, 2, 1 -
00 00 00 01 LCC LIFT-OFF!
00 00 00 02 CDR And the clock is running.
00 00 00 04 CMP Okay. ... lift-off ...
00 00 00 12 CC Clear the tower!
00 00 00 13 CDR Roger dede [sic]. Clear the tower, and we have a roll program. ... 
00 00 00 18 CC You have good thrust on all five engines.
00 00 00 21 CDR Thanks, Gordo. Roll's complete. And we have a pitch program.
00 00 00 29 CC Pitch.
00 00 00 39 CC Stand by for Mode I Bravo.
00 00 00 42 CC MARK. I Bravo.
00 00 00 44 CDR Roger. I Bravo.
00 00 00 45 CMP PROPELLANT DUMP, RCS COMMAND, Dave.
00 00 00 46 CDR Okay.
00 00 00 54 CDR Okay. Going through the air. (Laughter)
00 00 00 55 CC ... 15 ...
00 00 00 56 CMP Cabin pressure decreasing.
00 00 00 57 CDR Okay. Good.
00 00 00 58 LMP Looks good over here.
00 00 01 00 CMP High at 20,000.
00 00 01 01 LMP Dead
00 00 01 02  CMP  One minute.
00 00 01 03  LMP  Here ...
00 00 01 04  CC  ..., Houston. Everything looks perfect down here.
00 00 01 06  CDR  Okay. Looks smooth up here, Gordo. Okay, the altimeter is six zero.
00 00 01 12  CMP  Well, how about that?
00 00 01 28  LMP  Exciting!
00 00 01 30  CDR  Okay. We're through MAX q.
00 00 01 34  CMP  Okay. 1:32. Program looks good, Dave. Out at 11 miles.
00 00 01 40  CDR  Okay. Good shot. Two and 1/2g.
00 00 01 44  LMP  Roger.
00 00 01 47  CDR  Pitch profile looks good.
00 00 01 50  LMP  Roger.
00 00 01 52  CMP  1:50.
00 00 01 55  CC  Stand by for Mode I Charlie.
00 00 01 58  CC  MARK. I Charlie, now.
00 00 02 00  CDR  Roger. I Charlie.
00 00 02 02  CMP  EDS AUTO to OFF.
00 00 02 06  CDR  Okay, we're at 3g's. Stand by for inboard.
00 00 02 14  CMP  Okay. The program's looking good.
00 00 02 18  CDR  Inboard.
00 00 02 19  CC  ... Inboard.
00 00 02 30  LMP  A little high hum, there.
00 00 02 31  CMP  Yes.
Okay, 10 seconds to staging. Hang on.
Okay.
Five seconds.
Man, you aren't kidding.
Boy.
Good stage.
... Houston. You have good thrust on the S-II. All five are good.
Okay.
Good show. We'll go on time.
Second plane SEP.
... Good show.
Tower JETT.
We confirm the skirt SEP. You're Mode II.
Roger. Mode II. Guidance initiate.
How we doing, Al?
We're doing fine; 63 miles.
Good.
Everything looks good over here.
Okay.
Just - looks just about a hundred feet per second down on the H-dot, but everything else looks fine.

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

Yes --

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

Okay, Gordo. Looks good up here.

Man, I got the Moon in my window.

Yes, sir. It's out there.

Thrusters are stable; the ball's stable.

We're at a V_i of 11,000 and right on the money.

Good show. Let me check here at 4:30 just to make sure.

That sucker's right on - right on.

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

I hope so by now.

..., Houston. Five minutes. Everything looks nominal. You're GO.

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

...

Yes siree, looks good.

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

Uh-huh.

Every once in a while?
00 00 05 25 CMP Yes.
00 00 05 30 CDR Very low amplitude.
00 00 05 41 CDR Okay, be watching for the S-IVB for COI.
00 00 05 44 LMP Okay.
00 00 05 45 CC ..., Houston. Times are nominal. The level sense arm will be 8 plus 34, and S-II cut-off at 9 plus 09. Over.
00 00 05 53 CDR Roger; 8 plus 34 and 9 plus 09.
00 00 05 57 CDR Okay, Jimmy; gimbal motors.
00 00 05 58 CC Stand by for S-IVB to COI.
00 00 06 00 CC MARK. You have S-
00 00 06 02 CDR Roger. S-IVB to COI. Jim?
00 00 06 04 LMP Ready. 1, 2, 3, 4.
00 00 06 11 CMP On and trimmed.
00 00 06 22 CDR Okay, we're right - right down the line.
00 00 06 26 LMP Okay.
00 00 06 27 CMP Coming up on 15,000 $V_I$, 260 H-dot. That's right...
Now, let's see. You want to do that EMERGENCY CABIN PRESSURE thing?

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

Okay.

Here's your Lexan, Jim.

Okay.

Got it?

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

Yes, okay.

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

Yes, right.

Okay. Helmets and access - helmet bags and accessory bags.

Right here.

Okay. The Lexan shade is on.

And grab the TSBs while you're there, too. Dave.

Okay.

Okay, Jim. I guess we could do the --

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

Must be in U-1.
00 00 30 23 CDR  Really?
00 00 30 24 CMP   Yes.
00 00 30 27 CDR  In U-1 - I was looking in U-2?
00 00 30 30 CMP   Oh, okay.
00 00 30 32 LMP   Let's see. The O₂ FLOW is high.
00 00 30 34 CMP   What's the cabin pressure --
00 00 30 35 LMP   Oh, it - it just dropped down.
00 00 30 36 CDR   Yes. Okay.
00 00 30 37 CMP   What's - what's the cabin pressure? We still got the waste stowage vent --
00 00 30 38 LMP   Yes. It's ...  
00 00 30 39 CDR   It's 6.
00 00 30 40 LMP   Well, it was just high for a little bit.
00 00 30 41 CMP   Yes.
00 00 30 42 LMP   Okay. CABIN PRESSURE - EMERGENCY CABIN PRESSURE valve to BOTH, Al.
00 00 30 48 CMP   Okay. EMERGENCY CABIN PRESSURE going to BOTH.
00 00 30 50 LMP   And SUIT CIRCUIT RETURN VALVE, open, Dave.
00 00 30 55 CDR   Yes, sir. It's open.
00 00 31 00 LMP   Okay. We can - I got the window cover on. We can remove helmet and gloves and stow in PGA bag.
00 00 31 05 CDR   Don't we - don't we do a check first?
00 00 31 08 LMP   No, we don't. That MAIN REG check's on the next page.
00 00 31 11 CDR   Well --
00 00 31 12 LMP   As long as you're in position though, Al, let's do it.
00 00 31 13 CMP Yes.
00 00 31 14 CDR Let's do it.
00 00 31 15 LMP Okay. MAIN REG B valve, closed.
00 00 31 17 CMP MAIN REG B, closed.
00 00 31 18 LMP EMERGENCY CABIN PRESSURE, select to 1.
00 00 31 20 CMP 1.
00 00 31 21 LMP PUSH TO TEST pushbutton, push for O₂ FLOW increase.
00 00 31 23 CMP Okay.
00 00 31 30 CMP Don't see anything.
00 00 31 31 LMP There it goes --
00 00 31 32 CDR Okay. There it goes.
00 00 31 33 CMP Okay.
00 00 31 34 LMP Okay. MAIN REG B valve, OPEN.
00 00 31 35 CMP OPEN.
00 00 31 36 LMP MAIN REG A valve, closed.
00 00 31 37 CMP Closed.
00 00 31 38 LMP EMERGENCY CABIN PRESSURE, select to 2.
00 00 31 40 CMP To 2.
00 00 31 41 LMP PUSH TO TEST pushbutton, push for O₂ FLOW increase.
00 00 31 44 CMP Okay. Pushing. I got it.
00 00 31 47 LMP Okay, MAIN REG A valve, OPEN.
00 00 31 49 CMP OPEN.
00 00 31 50 LMP EMERGENCY CABIN PRESSURE, select to BOTH.
BOTH.

Okay. That's complete.

Okay.

So, we - you want to take off helmets and gloves now?

Yes.

..., yes.

Cabin pressure look good?

Yes.

Okay. Let's get into our little home. Shall we do it?

The accessory bags inside here, Dave?

Yes.

Let's see, you're C.

Okay, thank you.

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

R, okay.

R, C, and L. Guess we can keep track of that.

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

Don't you say that.

(Laughter)

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

Boy. Sure doesn't take much to scratch these helmets.

No. Sure doesn't.
00 00 33 30 CMP Oh, it's quiet.
00 00 33 32 LMP Sure is.
00 00 33 34 CMP Let's see, what have we got going, just the suit fans?
00 00 34 09 LMP It's so quiet, it's kind of eerie -
00 00 34 11 CMP Yes.
00 00 34 12 LMP Almost like a space flight.
00 00 34 18 CMP (Singing)
00 00 34 19 CDR Okay. We got to snap these things ...
00 00 34 24 CMP Yes: We're supposed to try to keep them up there where we can get them ...
00 00 34 29 CDR You give me a hand here, will you?
00 00 34 30 CMP Yes, we'll give you one.
00 00 34 32 LMP ... onboard ...
00 00 34 40 CDR ... convenient place ...
00 00 34 45 CMP Yes.
00 00 34 47 LMP ...
00 00 34 53 CMP ...
00 00 35 08 LMP You want to ... them all?
00 00 35 10 CDR I guess -- 
00 00 35 11 CMP ... all ... put them up.
00 00 35 20 CMP I'll never do this again.
00 00 35 28 CDR I'll bet you would (laughter).
00 00 35 30 CMP Oh, what a joy! (Laughter) Oh, what a joy!
00 00 35 34 CDR You don't ... to mind it.
What a joy! Too much ...

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

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

DAC.

Got magazine Able.

Able. Okay.

Okay, which lens?

Power cable, 18-millimeter lens.

18-millimeter lens. Okay, 18 lens.

Right-angle mirror.

Right-angle mirror.

Assemble and mount in the left-hand window ...

Left hand ... Okay, ... need to get out of here ...

Here's the mirror.

... the power cable.

Okay, Dave, when you get a chance, you want to
monitor SECONDARY ACCUMULATOR QUANTITY.

Now - do you want to get the Hasselblad out?

Oh, yes. Yes, we want --

It's got a MAG.

Well, better cross it out. ...

MAG M. Oh, it is crossed out?

... EL. Oh, okay. Spotmeter. Stow in the IMP TSB.
I guess you better get the TSBs out ... --

CONFIDENTIAL
00 00 37 08  CMP  Yes.
00 00 37 10  CDR  And the TSBs are up behind Jim.
00 00 37 12  CMP  Yes. Yes. They're behind you, Jim.
00 00 37 15  LMP  What, the TSBs?
00 00 37 16  CMP  Yes.
00 00 37 17  LMP  Up over here?
00 00 37 22  CMP  Guess that's all we need out of here for now. ...
00 00 38 04  LMP  Boy, you really get a Coriolis effect by looking at that ... in here.
00 00 38 08  CDR  Yes, that's why I say, just go slow, because it will all go away here in a few hours. Won't even notice it. ... --
00 00 38 14  LMP  ... always felt we'd parted some company, didn't you?
00 00 38 17  CMP  Yes.
00 00 38 18  CDR  No, but it's nice to just go slow.
00 00 38 20  CMP  Yes. Oh, yes, it's --
00 00 38 21  LMP  Are you ready for some TSBs?
00 00 38 23  CMP  Yes, you need yours most of all.
00 00 38 25  LMP  I - I need mine?
00 00 38 26  CMP  Yes, because you need to put these two cameras in it.
00 00 38 29  LMP  Okay.
00 00 38 43  LMP  Okay. You want to hand me the camera, Al?
00 00 38 46  CMP  Okay, Jim, that's the - Yes, here you go.
00 00 38 49  LMP  Is that for my UV work?
00 00 38 51  CMP  Your EL with magazine M in it.
00 00 38 54  LMP  For the UV?
Yes. Okay. And here's your spotmeter.

Spotmeter go in here, too?

Yes. Got it? Okay. I'll get the TV camera out.

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

Yes.

-- that secondary RAD leak check?

Yes, sir.

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

Have, you got tool E?

Yes. Yes, it's right up in front of you there, Dave.

Oh, thank you. Jimmy? Can you reach here?

No. And it's starting to get dark.

Really? I've got to get going on the P52.

Yes.

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

Yes; okay.

I'll do this ECS Postinsertion Configuration.

Okay.

Okay. GLYCOL RESERVOIR BYPASS valve to OPEN.

Okay, OPEN.

GLYCOL RESERVOIR OUT valve, CLOSE.

CLOSED.

CONFIDENTIAL
00 00 40 24 LMP  GLYCOL RESERVOIR IN valve, CLOSED.
00 00 40 25 CDR  CLOSED.
00 00 40 26 LMP  And the PRIM quantity, let me check it - 25 to 50 at - It's good.
00 00 40 34 LMP  Al, let's - Can you reach the PRIM ACCUMULATOR FILL valve?
00 00 40 35 LMP  Yes.
00 00 40 38 CMP  Okay, put it ON.
00 00 40 47 CMP  Here, Jim, can you reach the cable? ...  
00 00 40 51 IMP  Yes. I've got it now.
00 00 40 52 CMP  Okay.
00 00 40 57 IMP  You working on that one, Dave?
00 00 40 59 CDR  Sure am.
00 00 41 02 CMP  Can you get to it there, Dave?
00 00 41 06 CDR  Haven't yet. No. Can you get to it?
00 00 41 12 CMP  Well, what do you need? PRIMARY ACCUM?
00 00 41 15 IMP  Yes.
00 00 41 16 IMP  Yes, sure. Which way do you want it?
00 00 41 22 CDR  Well, it was the PRIMARY ACCUMULATOR FILL valve -
00 00 41 25 CMP  PRIMARY ACCUMULATOR FILL; okay.
00 00 41 26 CDR  ...  
00 00 41 28 LMP  Put it ON. I'll tel. when to - put it back --
00 00 41 34 IMP  Turn it ON?
00 00 41 35 LMP  Okay --
It's ON.

-- you can turn it back OFF.

Okay, it's OFF. Is that all?

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

Yes. SECONDARY GLYCOL TO RAD valve, NORMAL, Al, if you're in that position. Let me know when you - when you get it in NORMAL.

Yes, I can't quite reach that.

Okay.

...

Can you get it there, or --

Yes.

If you'll wait a minute, I'll be able to get it.

I can get it. Thank you.

Okay.

Let me know when you get it to NORMAL.

Okay, going NORMAL now, Jim.

Okay.

It's in NORMAL.

Okay, Jim. Here are the lines to the TV.

Wish I had a place to set that thing.

Yes. ... 

Okay. ... the monitor.

Okay. How long you want this thing in NORMAL?
Oh, I'll give you a hack here.

Okay -

MARK. It's - SECONDARY, looks okay.

Okay, I'm back to BYPASS.

Okay.

Is that right?

Right. BYPASS.

Dave, can I hand you the monitor over there?

What - Oh, yes --

For the TV.

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

GLYCOL TO RAD valve, NORMAL. ...?

I got that. ECS RAD FLOW CONTROL, POWER.

Oh. Okay, it's NORMAL.

Okay. You've got PRIM GLYCOL TO RAD valve, NORMAL --

Okay.

-- RAD HEATER going to PRIM 1.

Okay.

ECS RAD talkback is gray. GLYCOL EVAP TEMP IN going AUTO.

Okay, who can give me a checklist so I can do these optics?

Here you go.

Concealed
Okay, I --

POTABLE WATER HEATER to MAIN A. Okay. ECS Post-insertion Configuration complete.

Okay.

... Give you this monitor, Dave.

Okay.

What else you got on there, Jim? Oh, the TSBs. Yes, do you want a TSB? Yes.

I'll get them out. Do you want to put one up on the -- That'll do. ... --

Down there, Al. You --

... Okay.

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

Al, you want to check that?

I'm going to go through a secondary glycol loop check here.

Okay.

Hey, Al?

Yes.

See that little -- see that funny little switch they put on here?

Oh, really?
00 00 44 47 CDR
It came off.

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

00 00 44 49 CDR
Well --

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

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

00 00 44 54 CMP
Yes.

00 00 44 56 IMP
SECONDARY GLYCOL PUMP --

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

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

00 00 45 51 CMP
Hallelujah!

00 00 45 54 CDR
Getting stars?

00 00 45 55 CMP
Yes, sir!

00 00 45 56 CDR
Oh, okay.

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

00 00 46 06 CDR
Okay.

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

00 00 46 21 CMP
Okay. ...

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

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

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

00 00 47 01 CDR
Boy, at night, you might - might as well be in the simulator (laughter).

Yes, except for the physiological change.

Yes. Okay, the EPS monitoring check is complete, Dave.

Okay.

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

You can pick that up.

Yes.

Yes.

Okay. It doesn't look too good ... down in there.

EPS monitoring check now.

Okay. Did - did you do your fuel cell purge check, or ... --

No, I couldn't do the H₂.

Oh.

Doublecheck ... Forty-one. Okay, Dabih.

Forty-one, right.

... Five in. ...

Forty-one is what?

Dabih.

Dabih. ... okay?

Yes. I got it.

Okay, EPS monitoring check's complete.

Okay. Let's see how we did. (Cleared throat)
Day 1

00 00 49 15 CDR Well, pretty good.

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

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

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

00 00 49 27 CMP Do?

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

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

00 00 49 32 CDR Okay. ...

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

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

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

00 00 49 50 CDR Should we torque about 50?

00 00 49 51 CMP Yes.

00 00 49 52 CDR Okay. Good deal.

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

00 00 49 55 CDR Yes.

00 00 50 02 CMP Very good, Dave.

00 00 50 03 CDR Okay.

00 00 50 04 CMP Very good ...

00 00 50 07 CDR Okay, Al, and you might - Why don't you come up here and let me show you what the jets look like when we fire the ...
Oh, okay. Yes. Let me - let me check out a quick star here.

Well, we got to do - I want to do this before AOS.

Okay.

Well, let me climb up here. ...

Oh, I'm sorry. Okay. It's - it's good.

Yes. I ...

Yes.

Well -

Okay. You can probably look out my window.

Oh, yes. Very good --

I lost my watch.

Jim, you got my --

Yes.

-- stopwatch?

I'm looking for one.

Did you see that?

Yes, I saw a flash.

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

Could sure see a flash.

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

You know, it's amazing what ... outside that window ...

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

Davy?

Yes.

You want to put that on there?

... monitor?

Yes.

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

Why - why can't I put it on the bracket?

You can.

... Okay. Where's the bracket?

It's down in - A-1.

Okay.

Bracket's in A-1.

Okay. ... get it.

Man, that was some fantastic ride! Gaa!

Something you're not likely to forget for a while.

And when you get a chance, Al, I need the - the UV bracket.

Okay.

The UV bracket, and the UV ..., and the UV lenses.

Yes.

Yes.

Am I supposed to be ... you, Al?
00 00 59 56 CMP
No.

00 00 59 57 LMP
Okay.

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

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

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

00 01 00 32 LMP
Yes.

00 01 00 33 CDR
Yes.

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

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

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

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

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

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

00 01 01 36 CMP
How about that?

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

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

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

00 01 01 42 CMP
Oh!

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

00 01 01 44 CMP
Hm. Okay. ...
Okay, your pitch rate.

Why don't you --

Good ...

Okay, pitch?

Yes. Pitch, roll; roll, pitch. Good ...

Good.

And quad D going open.

...

Let me know when you all are --

... in the way.

-- ready for your TSBs, and I'll hand them to you.

Okay. Hey, you can give me mine, Jim. He's taking yours.

Then when you get a change --

Okay, ... TV bracket.

-- you can give it back.

Okay, Al, here's your TSB.

Okay. ...

Dave, here's yours.

Gee, thanks a lot, Jim.

Any time.

... but the University of Michigan was well represented.
Is that right? (Laughter)

Yes. Couple of little calling cards here.

You know, I keep going up to the top of the vehicle.

Well, that's a common phenomenon.

Up toward that hatch.

Everybody always has.

... funny.

That's exactly right. We did that for 10 days and never figured out why.

Shoot! ... somebody ... this hatch. ...

Al, I'm going to give you the ... to put back up there.

Okay.

So we don't lose track, here.

That's the name of the game for the next 12 days, gang. Put it back.

Okay. Let's see, Al. Do you have the -

What? The TV lens? Where's the TV?

Right on the couch.

... back here and see if I can bump into it.

Okay.

Do you have the right settings on it? Want me to read them to you?

Yes, what are they?

I don't know why we've been putting that TV up so early.
00 01 04 37 CMP  Just to get it out of the way.
00 01 04 46 LMP  Okay. We want ALC to peak. And f/44.
00 01 04 55 CDR  Peak - and average.
00 01 05 02 LMP  ALC to peak.
00 01 05 03 CMP  No, wait a minute; f/44.
00 01 05 10 CDR  Okay, f/44.
00 01 05 12 LMP  Yes.
00 01 05 30 LMP  Guess we - we might as well leave the - the lens
cover on until we're ready to use it.
00 01 05 35 CMP  Dave, did you do - do that SCS attitude reference
- reference check?
00 01 05 38 CDR  I'm doing it right now.
00 01 05 39 CMP  Okay.
00 01 05 52 LMP  Sunrise in about 16 minutes.
00 01 05 57 CDR  Okay, f-stop at 44, with about - ...
00 01 06 04 CMP  Get the - Judge that -
00 01 06 07 CDR  Okay.
00 01 06 08 CMP  -- ground direction.
00 01 06 09 CDR  -- ... f-stop, 30, and the focus at - at infinity. ...
00 01 06 20 CMP  That's right.
00 01 06 21 CDR  I'll take those. I guess it doesn't really matter ...
00 01 06 25 CMP  Yes.
00 01 06 26 CDR  Okay, Jim, if you want to stick that in the -
00 01 06 31 CMP  ... back you up.
00 01 06 35 CDR  And I'll plug it in.
Okay. Attitude reference check.

Okay.

Hey, Jim. You got the SPS monitoring check all right? ECS monitoring check? EPS?

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

Yes.

After that SCS reference.

Okay, Jimmy, you're all hooked up.

Okay. If I can just get my bracket in here. Pointed in the right dir --

Do we need anything else out of A-1, before I close it?

When you get a chance, Al, out of R-12, I think I need that - probably need - ...

Just like that cardboard - for the window.

You - you want - you want to pull R-12 out?

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

Okay. We really don't have a place to put this if you got the TV up ...

That's what you got a Flight Plan volume for.

Whoops.

How you doing, Jim?

All right --

What do we have in there?

Flight Plan, Malfunctions, and all that jazz is in there...
Okay.

The card - is my cardboard window shade in there, or something else?

We didn't find it here ...

Thank you.

Probably ... supposed to be with the cue cards.

Okay, I didn't find it.

I don't know. Our Flight Data File boxes up here, they're almost empty.

Maybe they just happened to fall open.

No, there's just very little in here.

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

Yes. I've already ... all through these containers.

Oh.

Well, we got all our data - got all that -

It just doesn't take up a whole container. All those checklists ...

... There I need MAG N.

You need MAG N. (Cleared throat) Okay, coming up.

Where are the rest of the cue cards?

I think we got the ... in the pocket.

Do we?

Yes, I think so.

... reversed hoses here ...
00 01 11 41 LMP ... 
00 01 11 51 LMP ...
00 01 11 52 CMP Hmm, ORDEAL.
00 01 11 54 CDR ORDEAL?
00 01 11 56 CMP Yes, man. ... seems like it can be just a hell of a ...

00 01 11 59 CDR Well, don't hurry.
00 01 12 00 CMP Yes, let me - get my coffee here.
00 01 12 04 CDR Yes.
00 01 12 10 LMP Did you finish that check, Dave?
00 01 12 14 CDR Yes, the attitude reference check is complete.
00 01 12 22 CMP Goddam ...
00 01 12 25 CDR The what?
00 01 12 26 CMP ... the whole spacecraft.
00 01 12 41 CMP Yes, the red one.
00 01 12 44 CDR Here's MAG M, Jim.
00 01 12 48 LMP Okay. ...
00 01 12 50 CMP Okay, coming down to ORDEAL, David.
00 01 13 11 CMP Oh! ... can't - we can't do this - ... I can see ... hoses ...
00 01 13 15 CDR Al, don't ... --
00 01 13 16 CMP Okay, there we go, Dave.
00 01 13 17 CDR No, that's all right.
00 01 13 18 CMP I just got my hoses ... If you - if you can --
00 01 13 24 CDR Yes, I can get it.
... Dave. There we go.

Good. We got it.

Okay. Got it?

Yes. Thank you.

Need some help?

Okay.

Well, this is going to be a backroom brawl.

What?

It's always your fault, Dave.

...

Got to be ...

But it's all of that?

... get myself hooked up on everything here.

Hey, Al, if you get a chance on this - Did you find my cardboard window covering?

No.

Data Card Kit?

Which part of the Data Card Kit?

Well, I don't know. I don't know.

Here, let me look some more.

Yes. I don't even see where the cue-card part of the Data Card Kit is.

Uh-huh.

...

... Data Card Kit.
Okay. ...

UV Card Book ...

Okay. I guess I don't need it.

... Okay.

Whoop!

Bet that ought to be ...

(Coughing) Hey, you know, I got your meal, Al?

Do what?

... chow.

Oh, yes. Yes.

Hey, I think I'm pretty well caught up with the UV photography here.

Good, Jim.

Getting around with the --

Goody, goody. Read over the procedures.

Want me to read them to you?

No, why don't you read them to yourself?

Well, that's what I'm doing.

..., Jim.

I - I - Did you get the - Oh, you're looking for the cue cards, is that right?

Yes, I'm just trying to get them all sorted out.

And --

...

Who has the tape?
Just a second, Jim, and I'll get it.

I can reach it. Have to push these back - Watch your foot!

Oh!

(Laughter)

Man, you hit my foot; it really --

Did it really bug you?

Yes.

I don't think we need the Data Card Kit out right now.

May - maybe we could - Is there a good place to stow this down there?

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

Is this just for this pass, Jim?

Shade.

Yes.

Uh --

Are you going to --

Yes.

-- take it down?

I think - Yes, that's probably --

When?

-- that's probably true. The next pass is at about ...

Yes, I'll have the cardboard up for it.

Yes.
00 01 18 02 LMP  I need the - probably the ...
00 01 18 04 CMP  I guess we could put - we put that back up before
we do TLI, don't we?
00 01 18 07 CDR  Yes.
00 01 18 09 CMP  You need what, Jim?
00 01 18 11 LMP  Yes --
00 01 18 12 CDR  Oh, look at the horizon.
00 01 18 13 CMP  Okay, you guys, let that thing be - let it be.
00 01 18 15 LMP  Oh, boy!
00 01 18 16 CDR  Come on up here and look at this. ... switches.
00 01 18 22 CMP  Okay; all right. All right, have you got - have
you got ... This is unreal to watch.
00 01 18 31 CDR  You've got to watch this, boy. This is one of
the beauties that few people ever --
00 01 18 36 CMP  Ah!
00 01 18 37 CDR  -- get to see.
00 01 18 38 LMP  ... Ooo!
00 01 18 39 CMP  Gaa.
00 01 18 40 CDR  ... Look at the clouds.
00 01 18 41 LMP  Yes.
00 01 18 42 CDR  Just watch it, there. Watch this for a few
minutes. ... 
00 01 18 47 CMP  Look at that. You can see lightning. Looks like
streaks of lightning around there?
00 01 18 54 CDR  See the little light thing out there?
00 01 18 57 LMP  ... Oh, yes.
Oh, yes. I didn't see that.
I didn't either.

... 
Ooo, like - Oh, that - that's fantastic.

That's a --
Yes.

That's a satellite.
Hey, you're right! That's got to be.

Yes.
Sure it's a sat - satellite, not a - a planet?
That's a satellite, Jim.
Well, look.

Come on. ... planets are like -
Son of a gun.
I'm backwards.

Huh, I guess it is a planet. It's sure bright, though, isn't it?
Yes. ... rest.

It's sure bright, but it's a planet.
Is it going to be black like this all the way out?

Look at those clouds.
Yes.

Yes, ...

I've got something like ...
... see a damn thing.
...
No.
...
By golly, it's getting bright and early.
I've got ... 8. ... about like this.
...
That Earth is a big mother.
Yes, it looks pretty big, but I think it's probably going to be small.
(Laughter)
Yes (laughter).
I hope it does.
(Cough) Yes, that must be a planet, Dave, because --
You were right.
-- it's staying in inertial, and we're going ORB RATE now.
...
...
Boy! Get your sunglasses.
Yes, it's bright, isn't it?
Boy, oh, boy!
Yes. ... Let's see, I'm going to start getting up around ...
I can. ...
I hear you. ...
Too much trouble for me to get - for you to get ...
(Cleared throat)
Looks like Aquarius coming up back there.
Yes. How about your rendezvous window, Jim?
It's fine. Yes.
Okay. ... load it with ...
Yes.
... You think you need a ... there, Jim?
I've got it, man. It shouldn't.
I couldn't prove it to you.
... Oh, I see ...
Beautiful!
...
Check that.
...
I've got to get that ... to dock.
So you're going to ...
...
Which reminds me, I've got my own docking checklist.
Oh, you did?
Got your ...?
What's the matter with this other one?
Well, the one - the one I found, it's the one that doesn't have any, you know, any references in it.

(Laughter)

You never got the other one changed?

There ain't no way I could do that.

Okay.

... okay.

...

...

We'll be watching you.

Hand controller, not a ... control. Okay.

Okay. Why don't ... the program?

(Cleared throat)

...

What do we have to do?

Where are we stowing the tape?

Just ... it.

We should be stowing it back where it goes.

Here's the tape, Al. Where are you putting it, down there?

Okay. ...

Well, we got 8 more minutes.

...

Are you ready for the UV, Jim?

Yes, ... It says 1:35.
00 01 23 05  CDR  Yes.
00 01 23 07  IMP  I - I guess - I guess I might as well wait until then.
00 01 23 10  CDR  Yes, I think you should. Let's do everything right on the money.
00 01 23 14  CMP  The UV is on time ...
00 01 23 17  LMP  Yes, sir.
00 01 23 18  CDR  When do we shut it off? Do you shut it off ...?
00 01 23 21  CMP  Yes. I agree with you.
00 01 23 22  CDR  I just want to --
00 01 23 23  LMP  Do you want to wait until we get --
00 01 23 25  CDR  ...
00 01 23 27  LMP  -- AOS before we do the docking probe, don't you?
00 01 23 29  CDR  Oh, I don't know.
00 01 23 30  CMP  (Cough)
00 01 23 31  LMP  Do you want to go through it now?
00 01 23 33  CDR  Yes, let's go through it.
00 01 23 34  LMP  Okay, CB DOCKING PROBE, two, close. Two, verify.
00 01 23 36  CDR  Two, verify.
00 01 23 37  LMP  DOCKING PROBE EXTEND/RELEASE to EXTEND/RELEASE until full probe extension.
00 01 23 41  CDR  Okay, ready.
00 01 23 43  CMP  Okay, here it goes. You've got it, man.
00 01 23 46  LMP  Yes.
00 01 23 47  CMP  Pretty good. Okay, got a barber pole to gray.

CONFIDENTIAL
Okay. DOCKING PROBE EXTEND/RELEASE to RETRACT. Talkback gray.

RETRACT. Talk back gray.

Okay.

Okay, let's get ... here.

There are a lot of clouds out there, huh?

Sure are. ...

Hey, Al, you got the - the Hasselblad down there?

Yes, it's in the TSB. The Hassel - Well, the Hasselblad's set up for the UV window.

Yes.

The spotmeter. Did you get ...?

Yes.

Yes. Yes, it's --

Sure did.

The TV is all ready.

Yes.

... the pad. You got your updates. PYRO ARM ...

... the TLI Prep Book.

Yes, ...

Hey, now, do you have the TLI card in your pocket?

No, I have it.

No use in finding mine. I did look.
Okay.

... 

It must be in my ...

It must be in your ...

Oh, yes? You get a better ... (laughter).

You carried my lunch; I carried your card.

Did you really get it?

Sure.

... S-IVB/TLI.

...

...

Yes, I -

Well, I got a ... here ... a little culture.

When we get past this cloud bank, I think I might take some of these UV pictures.

They want some clouds for the UV.

Yes, I know. But I didn't want --

Oh.

-- solid clouds.

What are you all looking at out there? Can you tell?

Oh -

You mean what part of the world?

No - about where the camera's pointing. ... They didn't care what time, but we need to correlate it. ...
00 01 26 33 CMP (Cleared throat)
00 01 26 39 LMP ...
00 01 26 43 CMP Hey, look. There's ... out there, I think.
00 01 26 44 CDR Where?
00 01 26 45 CMP Huh?
00 01 26 46 CDR Yes.
00 01 26 47 CMP ...
00 01 26 48 CDR Yes.
00 01 26 49 LMP Oh, yes.
00 01 26 50 CDR Hey, man.
00 01 26 51 CMP Can you see ... over there?
00 01 26 52 CDR Oh, that must be it.
00 01 26 53 LMP Yes.
00 01 26 54 CDR Man. That must be it.
00 01 26 55 CMP ...
00 01 26 56 LMP I'll take some UV pictures of it.
00 01 26 57 CMP Okay.
00 01 26 58 CDR That's good, Jim. Good deal.
00 01 26 59 CMP Except I don't think we know the right time. ...
00 01 27 02 CDR Yes.
00 01 27 03 LMP Oh, you can see some of that pattern. ...
00 01 27 06 CDR ... far-reaching pattern.
00 01 27 08 CMP Hey, yes. We know where it is.
00 01 27 15 CDR ...
00 01 27 28 CMP ... Is that the right thing?
00 01 27 40 CMP This thing is really, really weird.
00 01 27 47 LMP ... I didn't even notice the S-IVB flashes, but you can see them now.
00 01 27 52 CDR Yes. The S-IVB --
00 01 27 54 CMP Yes, I noticed them. (Cleared throat)
00 01 28 02 CDR Well, let's see. I guess somebody's got to be ready to copy pads.
00 01 28 07 CMP Yes.
00 01 28 08 CDR Jim, I guess you're going to be busy with the --
00 01 28 11 LMP No, no, I'll be doing that. It won't take long to do this.
00 01 28 13 CDR All right. I'll get the pyro arm check when we get the comm back.
00 01 28 19 LMP ...
00 01 28 22 CDR Al, why don't you get the --
00 01 28 24 CMP Yes.
00 01 28 25 CDR Why don't you get this thing ...?
00 01 28 27 CMP ...
00 01 28 28 CDR ...
00 01 28 29 CMP Okay.
00 01 28 30 CDR Okay.
00 01 28 31 CMP Do you - do you want me to ... the ...
00 01 28 35 CDR Yes. Yes, I've already scratched mine ...
00 01 28 50 CMP Get the ... quantity --
00 01 28 54 CDR The glycol pump? Get the glycol pump?
(Cleared throat)

15, Houston. Over.

Hello, Houston; 15.

Would you put the - You're loud and clear, Dave. Would you put the IU UP TEL - -

TIME SKIP

- - ..., INJECT.

INJECT.

EDS POWER, on, up.

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

Okay. You got EDS POWER, on, up?

No, hold - -

You want me to hold off?

Yes.

Okay. ...

Really not much more to check. GDC aline; I'll wait until we get a little bit farther down the road to do that.

Okay. Where is my kitchen timer, Al?

Down below. You want it?

Yes, I guess I ought to put it to use when I start cycling on the cryo fans here shortly. You know, we - actually, we have plenty of time. I could put that 105 lens on again and take a colored picture.
CONFIDENTIAL Day 1

00 01 54 33 CMP Yes.
00 01 54 34 CDR Colored picture? ... 
00 01 54 36 LMP ... there's a requirement to do it.
00 01 54 38 CDR Yes.
00 01 54 39 LMP ... - with the 105 lens.
00 01 54 41 CDR Good idea. Why not do it?
00 01 54 43 LMP It's - it's not the same place, but -
00 01 54 47 CMP Yes, yes - Well, there's no - no - If you want to take a color picture, they - what they want is a color picture to back up the scene you're seeing in the UV. So, if you can't get a color picture of that area, there's no sense taking it. But you might go ahead and take some pictures with the 80 millimeter. There's nothing wrong with that. On the - ...
00 01 55 22 CDR Have you got the Update Book out, Jim?
00 01 55 25 LMP No, I don't.
00 01 55 26 CMP Did you log - you didn't log the UV pictures in here, did you?
00 01 55 29 LMP Yes.
00 01 55 30 CMP Where did you log them?
00 01 55 31 LMP Oh, on - in the photo procedures here. ... - -
00 01 55 32 CMP No, we want to log them on the - on the ...
00 01 55 58 CMP Photo Log - 70 millimeter, MAG N, was it?
00 01 56 05 LMP Yes, MAG N.
00 01 57 27 CDR Ohh! ...
00 01 58 13 LMP (Laughter) Get the - get the ... out.
00 01 58 17 CMP (Laughter) Yes, I reckon. How's old Davy?
Oh, we're muttering along, flying across the sea.

Do you have yourself strapped in the seat there, Dave?

Yes. I do that most of the time, I think.

Yes, I like to do --

It's a lot more comfortable. ... relative position.

Because, otherwise, you're fighting the panel all the time.

Yes. My problem.

... Why?

We could take these lifevests ...

Yes, we could.

... Should we stow the lifevests?

Yes.

Yes. ...

Get that in there somewhere?
00 02 00 20 CMP ...  
00 02 00 38 LMP Not nearly as loud at 5 psi.  
00 02 00 40 CDR Yes.  
00 02 01 12 CDR Get your lifevest put away, Jim?  
00 02 01 15 LMP Yes.  
00 02 01 51 CDR ... things on?  
00 02 01 52 LMP Okay.  
00 02 02 34 CDR Got your ...?  
00 02 02 40 CMP Yes, I ...  
00 02 02 50 CMP Can't get it quite as tight as ...  
00 02 02 59 LMP Where would you keep the Update Book?  
00 02 03 07 CDR R-3 is a pretty handy place for all those books up there.  
00 02 03 15 LMP Do we have a strap?  
00 02 03 18 CMP Velcro ...  
00 02 03 21 CDR Is there a snap up there?  
00 02 03 25 LMP No, ...  
00 02 04 38 CMP I think I see it now.  
00 02 04 47 CDR Ah, it'll be dark pretty soon. We'll get to see the never-never land. There's no horizon.  
00 02 04 58 CDR We got to have some place to put the ...  
00 02 05 02 LMP Well, we could unhook it. Maybe --  
00 02 05 05 CDR Matter of fact, why don't we get everything stowed for TLI? ... couple helmets - Why don't you put it down in the LEB somewhere, and we'll just leave them there until after TLI --
00 02 05 15  LMP  The helmets?
00 02 05 17  CDR  Yes.
00 02 05 18  LMP  Yes.
00 02 05 19  CDR  Let's - let's just leave them until we get docked and start getting up into the tunnel --
00 02 05 23  CMP  Yes.
00 02 05 24  CDR  - - put them on.
00 02 05 25  CMP  Okay.
00 02 05 36  CMP  Could just stick these PGA bags in there.
00 02 05 40  CDR  Yes.
00 02 05 41  CMP  Whoops! Did I do it again?
00 02 05 43  CDR  I don't know, did you?
00 02 05 44  LMP  You're pretty consistent down there, Al.
00 02 05 47  CDR  I can't imagine you did that twice in a row.
00 02 05 56  CMP  ...
00 02 05 57  CDR  Huh?
00 02 05 58  CMP  ...
00 02 06 01  CDR  The emergency cabin regulator check book.
00 02 06 05  CMP  ...
00 02 06 06  CDR  Huh?
00 02 06 07  CMP  ...
00 02 06 08  CDR  Must have been.
00 02 06 14  LMP  We're getting a good check at that, Al.
00 02 06 18  CDR  ... Watch your big feet.
Are we going to eat before TLI?
You're kidding.
No, ...
We need an emergency ...
Sort of an early time.
Okay, give me your helmet back there, Dave, and I'll stash it away.
Okay.
 Gets dark fast, doesn't it?
Yes, it does. Yes, you see never-never land out there?
...
Yes. No - no horizon at all.
Anything else you want ...?
No, that's all right.
Let's just take a look at this ... Sort of interesting.
...
Yes.
...
...
What, that over there?
Boy, that's - Look at that planet, how orange it is out there, Dave? Directly ahead.

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

It wasn't the same one.

Huh? Tell me that.

Oh, you're - you're still saying it's a satellite, huh?

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

Yes?

- - when we had sunrise as we go into sunset. So that tells me something.

Two hours 10 minutes and 7 seconds. Turn the lights out. ... never-never ... Now I can put the COAS on it. And for the COAS, ... It's right on it. It's depressed - just about 18 degrees. ... Here we are. Here we are at ORB rate. Time's going to be 20 - 2:10. Okay, I'm going to mark it. ... Get a writing pad. Two hours and 11 minutes exactly.

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

... that flash out there ...

Oh, that's the S-IVB.

... the S-IVB ...

Okay.
00 02 11 34  CMP    Well, you know, that's got to be Saturn. Saturn is over by Scorpio.
00 02 11 44  CDR    Yes, it could be.
00 02 11 45  CMP    Yes, and Antares ...
00 02 11 57  CMP    ...
00 02 12 00  CDR    Look at all the ...
00 02 12 05  LMP    ..., Al. The Earth?
00 02 12 08  CDR    Yes.
00 02 12 19  CDR    Okay, let's see. We got everything stowed now?
00 02 13 13  CDR    Anybody want to eat anything now?
00 02 13 15  CMP    I'm going to wait until we get everything squared away after docking.
00 02 13 20  LMP    ... docking ...
00 02 13 23  CDR    What did you say?
00 02 13 24  LMP    ... Al ... How about yours?
00 02 13 33  CDR    Okay. Is your suit dry today, Jim?
00 02 13 36  LMP    Well, you haven't smelled too much urine, have you?
00 02 13 38  CDR    No.
00 02 13 39  LMP    Okay, it must have worked then.
00 02 13 40  CDR    Good.
00 02 13 43  LMP    Well, I'll tell you, I used it three or four times ... (laughter).
00 02 13 46  CDR    Did you really?
00 02 13 47  LMP    Yes. Three times before launch and once in orbit.
00 02 13 52  CDR    God, you really ...
00 02 13 55 LMP I really drank the Gatorade yesterday.
00 02 14 15 CDR Twenty-six minutes to go before ignition.
00 02 14 20 LMP Yes, I have ignition at 2:50:31.
00 02 14 33 LMP You want to wait until we get AOS and then start through it?
00 02 15 11 CMP We should have gotten ...
00 02 15 13 CDR What?
00 02 15 14 CMP ...
00 02 16 47 LMP We changed ...
00 02 16 49 CDR We have?
00 02 16 58 SC (Cough)
00 02 17 18 CDR Getting ready to go to sleep?
00 02 17 20 CMP No, lot of work to do ...
00 02 17 22 CDR (Laughter) Yes. About time.
00 02 17 27 CMP Yes, it is.
00 02 17 37 CDR I've been feeling a little more full in the head all the time.
00 02 17 40 CMP Yes.
00 02 17 41 CDR And -
00 02 17 42 LMP You mean it gets more and more?
00 02 17 43 CDR Well, for - it's up - everybody's a little different. For me, it gets a little more and more after the first - like 7 or 8 hours. And then it stabilizes, and you don't even notice it after the first night. I didn't. Ever - everybody's a little different. Your - your body adjusts - adjusts to the whole thing.
... feel tired quicker because we don't have anything to push against. Seems like ... --

No.

-- suddenly you don't have anything ...

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

TRANSLUNAR to INJECT.

... 

Verify.

That's a verify.

EDS POWER, on, up.

EDS POWER, on, up.

Perform EMS DELTA-V test and null bias check.

Complete.

Set DELTA-V₀.

Set to 10401.1.

10401.1.

Okay.

EMS FUNCTION, DELTA-V.

DELTA-V.

GDC ALIGN.

Okay, I'm ... check that.

... your ... box, it's real loose.

Oo-wee! That is.

...
00 02 19 21 CMP ...
00 02 19 30 LMP ... get that ... right.
00 02 19 54 CDR Three degrees on the GDC at 2 hours.
00 02 20 00 LMP What was it? What?
00 02 20 05 CDR Take 3 and a half degrees for 2 hours.
00 02 20 08 CMP Three and a half in 2 hours ...
00 02 20 10 CDR Yes.
00 02 20 27 CMP ...
00 02 20 29 CDR Ah. Yes, pitch and -
00 02 20 36 CDR What was the pitch? But that makes sense because we're ... in pitch.
00 02 20 41 CMP Yes.
00 02 20 43 CDR Okay. The GDC's aligned.
00 02 20 46 LMP Okay. Check the - check the DAP.
00 02 20 55 CDR 31102.
00 02 20 58 LMP Good.
00 02 20 59 CDR 01111.
00 02 21 00 LMP Good. Okay, key VERB 83, at ORDEAL.
00 02 21 16 LMP You want to set ORDEAL, 90 and EARTH.
00 02 21 19 CDR It's 90 and EARTH, and it's tracking very nicely.
00 02 21 22 LMP Okay. SEQUENCE PYRO ARM, two, to on, up.
00 02 21 25 CDR PYRO ARM, two, on, up. Two on, up. Okay.
00 02 21 36 CMP You didn't get P31 after you get --
00 02 21 40 LMP Might be a ...
00 02 21 41 CMP  Get started.
00 02 21 42 CDR  Yes.
00 02 21 45 LMP  Do you want to wait?
00 02 21 46 CDR  Yes. Let's do.
00 02 21 47 CMP  ... on the angle ... a good shape.
00 02 22 13 LMP  ... to put that on and watch it?
00 02 22 14 CMP  Mm-hmm.
00 02 22 15 LMP  Turn it?
00 02 22 16 CMP  Yes.
00 02 22 18 LMP  It looks to me like you could turn it first.
00 02 22 20 CMP  No, do it yourself. It's running ...
00 02 22 27 CDR  Yes. Right on the money.
00 02 22 30 LMP  I just don't believe we're here.
00 02 22 32 CMP  Yes. It's the greatest, for sure.
00 02 22 50 CDR  ...
00 02 22 52 CMP  That's for sure.
00 02 22 53 CDR  Yes.
00 02 22 54 LMP  You think we'll ...?
00 02 23 22 CDR  It's not bad up here in zero g either, is it?
00 02 23 24 CMP  No, hell no, it's not too bad at all.
00 02 23 27 LMP  Don't even feel supper.
00 02 23 28 CDR  Did you - did you this morning?
00 02 23 31 CMP  Yes.
00 02 23 32 CDR  I can't imagine why people - some people suffer.
00 02 23 37 CMP ...

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

00 02 23 43 LMP Ah --

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

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

00 02 23 57 CMP Yes.

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

00 02 24 04 CDR I guess.

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

00 02 24 14 CDR Huh?

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

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

00 02 24 25 CMP/LMP There it is.

00 02 24 27 CDR Yes.

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

00 02 24 39 CC Five by also.

00 02 24 41 CDR Okay.

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

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

00 02 30 55 CMP Yes, right.
00 02 30 57  CDR  Put your head back here in that little old cubbyhole.

00 02 31 00  CMP  Think that will help?

00 02 31 01  CDR  It might.

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

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

00 02 31 38  CMP  You ready?

00 02 31 39  CDR  Yes.

00 02 31 40  CMP  809 ... 58.

00 02 31 41  LMP  Sunrise at 2:48.

00 02 31 42  CDR  58, VERB 48.

00 02 31 51  SC  (Cleared throat)

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

00 02 32 01  CDR  Verified.

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

00 02 32 06  CDR  Okay.

00 02 32 15  CMP  What's EPS?

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

00 02 32 27  CMP  Right.

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

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

00 02 32 42  CDR  ... degrees per second roll. The S-IVB guidance function ... Okay.
Do we have Hawaii all the way through the burn?

I don't think so.

No, we haven't. ... No, we have --

AOS at 2:5 ...

We go through a keyhole --

LOS at --

No. We have LOS at 49:52 for ... minutes.

No, we get them back at 2:55.

Ooh.

(Cleared throat)

Yes, well, we tried it the other day.

Yes.

I hope so.

If you did, you can change your DELTA-V ... 20 feet per second.

There's ullage.

Yes.

I bet you it's from the S-IVB.

(Cleared throat)

Huh?

You're running about an 80-amp load.

... what that was?

...

We're down to .5 on the cabin.
Get that waste vent closed.

When do we close that?

When we get ready to dock, and the cabin's up to 5 pounds.

I thought we were supposed to leave some pressure for that.

I think we do.

Right after --

Right after TLI?

Yes.

I think we do it.

Right after WASTE STOWAGE VENT, CLOSED.

(Cleared throat)

There's ARIA.

Keep - keep looking.

You don't have the S-band squelch on, do you?

Yes, yes, I thought it was --

... we ought to be able to get that ...

... Oh, that's pretty - that is loud. Isn't it?

Yes.

Apollo 15, this is Houston through ARIA. Over.
Roger, Houston; 15. You're about 1 by 1 through ARIA.

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

What'd he say?

He said we're clear enough --

... - - ..., I think.

Roger. We got somebody else on the loop with us, too.

... ...

... ...

-- ... UP-LINK ACTIVITY light.

Okay.

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

Just a minute ... --

You can't change the frequency there. You might hook up -

It seems to ...

It's a bull's-eye.

Why don't we hook up the speakers, and let's do some checking. ...

Don't count too far.

S-II SEP light.

Yes.
It just came on, Dave.
We have the S-II SEP light.
You stand --
... SEP LIGHT.
Okay.
The UP-LINK ACTIVITY light went out.
Okay.

Okay. Monitor launch-vehicle tank-pressure sequence.

Very well. It should come on now. Come on, baby.
Here it comes. Come on.
It might fool you ...
Yes.

And coming up on 52 minutes.

Okay. ORDEAL PDAI 1 to ORB RATE; 2 to INERTIAL.

Okay, stand by 1. Okay, Houston. It looks like we have a slow repress start. We're up to about 22 or 23 on the fuel pressure. Okay; ORB RATE, INERTIAL.

Okay; ORDEAL MODE, HOLD/FAST.

HOLD/FAST. Go on.
All right.

... getting a normal repress. We're --
Okay; normal repress. Go, Jim.

Okay; 300 on the LUNAR.

And RH --

Armed.

UP TELEMETRY, CM and IU, both to BLOCK.

BLOCK's on.

Standing by for 56 minutes.

At 54, we go 25 degrees.

What - what was that on repress that you ... normal?

It's - it's just something that's a little slow in here.

Oh.

It's normally quite fast. ... At 54 minutes, we want to be at 25 degrees.

Wonder who all that is?

Yes, I wonder?

(Cleared throat)
00 02 44 30 AA ... 
00 02 44 44 AA ... 
00 02 44 52 AA ... 
00 02 45 01 CDR Coming up on 55 minutes. 
00 02 45 04 LMP ... 
00 02 45 08 CDR Okay. Coming up ... 
00 02 45 10 LMP Okay; at 56, slew FDAI 1 to pitch at 17. 
00 02 45 19 AA ... 
00 02 45 59 CDR Okay. ... 
00 02 46 00 LMP Seventeen. 
00 02 46 04 LMP Okay; at 56:45, it should be 14 degrees. 
00 02 46 10 CC ... through ARIA number 2. Over. 
00 02 46 11 CDR -- ... talking to him. Houston, 15; say again. 
00 02 46 20 CMP We lost him, Dave. 
00 02 46 21 CC 15, Houston. You're way down in the static, but I can hear you transmit. Over. 
00 02 46 28 CDR Okay; we'll pick you up at the keyhole. 56:45, you ought to be ORDEAL, OPERATE. Right? 
00 02 46 36 LMP Yes, OPERATE/SLOW. 
00 02 46 38 CDR What angle? 14 degrees? 
00 02 46 42 LMP Fourteen degrees. 
00 02 46 46 CMP ... 
00 02 46 49 CDR Minus. 
00 02 47 13 CMP Daylight? 
00 02 47 15 LMP Yes.
00 02 47 30 LMP Why don't they have a picture like that in the simulator?

00 02 48 01 CMP Two hours and 48 minutes.

00 02 48 17 CDR ... BLANK. ...

00 02 48 21 LMP TVC SERVO - SCS TVC SERVO POWER 1 to AC 1/MAIN A.

00 02 48 27 CDR Average g is on.

00 02 48 28 LMP Two, off.

00 02 48 29 CC Roger; average g.

00 02 48 30 CDR -- ... yet.

00 02 48 32 LMP TAPE RECORDER's going HIGH BIT RATE.

00 02 48 44 CDR THRUST mode, NORMAL.

00 02 49 33 CDR Put it in between the camera, Al. No, don't force it.

00 02 49 37 CMP ... Jim.

00 02 49 38 CDR Can you get it up there?

00 02 49 48 CDR Okay. Get ready, gang.

00 02 49 57 CDR Okay, 8 seconds. Three -

00 02 50 04 CDR Fire is on. We have ignition.

00 02 50 06 CC Roger; ignition.

00 02 50 15 CDR Okay. We're pitching now.

00 02 50 17 CMP ... full, high.

00 02 50 20 SC ...

00 02 50 22 CDR Okay. Yes.

00 02 50 24 SC ...

00 02 50 27 CDR Its tracking's real good.
Load's about a half a g. ORDEAL ... should be tracking with it.

Well, it had a little surge right at this ...

Picked up right there.

Okay. S-IVB pressure is 40 and 30, and we had a little surge at about 1 minute.

You feel a very slight amount of bumping ...

Yes, it does.

Could have been vibration.

Or trouble.

Yaw's tracking at about 1 degree.

ORDEAL's right on the money.

Track is GO. ...

Coming over the Hawaiian Islands.

Pressures are steady. ORDEAL's tracking.

Okay, Houston; 15. We're about halfway through. Pressures are steady at 40 and 30, and ORDEAL is tracking right on through.

..., 15. At 3 ...

Roger.

DELTA-V<sub>CG</sub>.

My countdown's going to be off probably 2 seconds here. Let's start my watch and ... it again. I want to be sure the engines ... start.

You can feel it, can't you?
00 02 53 38 CMP Yes.
00 02 53 41 LMP Converter's started.
00 02 53 42 CMP Pitchover's -
00 02 53 43 LMP I get the little surge before the bang.
00 02 53 47 CDR Okay, we're on P45.
00 02 53 50 CMP Pressure's looking good. ORDEAL's tracking. A quarter g - a half g ....
00 02 54 00 LMP That computer has ... DSKY ...
00 02 54 04 CMP That computer ...
00 02 54 06 CDR Really?
00 02 54 14 CMP 31,925.
00 02 54 37 LMP ... pressure.
00 02 54 39 CDR Okay.
00 02 54 41 LMP ... Houston.
00 02 54 56 CDR Hey, Houston. We have about a minute to go. We're tracking 39 and 30 on the pressures, and ORDEAL's about 0.
00 02 55 04 CC 15, Houston; Roger. Looks good here.
00 02 55 06 CMP O2 flow, high.
00 02 55 14 CDR That should be on for cut-off.
00 02 55 17 LMP Yes, that's right.
00 02 55 19 CC ...
00 02 55 29 CC ...
00 02 55 32 CMP I'll give you a countdown to 55.
Go ahead. ... Go to ...
Okay. Here's the countdown.
Okay.
10, 9, 8, 7, 6, 5, 4, 3 --
Okay -
SHUTDOWN, 5 plus 51. Okay. Cameras --
... stuff down here.
Okay. Al, get the data there.
Yes.
Check S-IVB tank pressures.
Okay. S-IVB tank pressure's about 32, coming down, on the oxidizer; and about 28, coming down, on the fuel.
Roger.
SCS TVC SERVO POWER went OFF - went OFF. PCM BIT RATE going LOW.
FDAI 1 to INERTIAL.
Yes.
RHC number 2, locked.
INERTIAL and locked. Okay, when Al gets through with ...
Okay, it's time to switch around.
Okay.
...
Okay, Gordo. Got some data for you, if you're ready to copy.
15, Houston. We're getting a lot of static for some reason. Say again, please.

Roger, Gordo. I've got the cut-off data for you, if you're ready to copy.

Go ahead.

Okay. We cut off on a $V_I$ of 35,614. TFC was plus 02; $V_G$ was plus 145; DELTA-$V_C$ was minus 14.9. And I've got the H-dot now, if you want it. H-dot was 4353, and altitude was 167.4.

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

Okay, Gordo. Okay, you got all your data, Al?

Yes. The EMS is off.


Okay, when the COMP ACTIVITY light's out, you're just supposed to ..., Al.

... switchy, switchy.

I need a VERB 66.

Okay.

Then when you all get down in the LEB, get that waste storage vent valve closed.

Yes ...

TIME SKIP

Coming up.

Okay.

I have a GDC ALIGN.
Okay. That's a pretty good ...
...
Okay.
GDC ALIGN's complete?
Yes.
Okay, EMS FUNCTION, DELTA-V. That's a verify.
Verified.
EMS MODE, NORMAL.
NORMAL.
Okay, got the DET set at 59:30.
Right.
Start that whenever you want.
Okay. ...
Okay.
Okay, Houston; 15. 30 seconds. Okay. We're counting, Jim.
Okay. At 50, we'll go to BMAGs, ATT 1/RATE 2; CMC, AUTO; and come off in CMC. There is ATT 1/RATE 2; CMC, AUTO, at 58, we'll get plus-X.
One, 2, 3. Okay.
Okay.
Okay.
Now get your valves, D. They look good.
Okay. Engine valves going to SCS.
... eight, gray.
Okay. I'm going to pitch over.

Okay.

Here we go.

Okay, Houston. We got a good SEP.

Got PRIM PROPELLANT B, SECONDARY, and Delta PRIM and SECONDARY - went barber pole, and they're both gray now. ...

... panel?

Yes. There goes the panels, right out to the side. Right outside.

Yes, I see them now.

Yes.

See it?

Yes.

It's spinning out there. You see the ---

What a view! You see the S-IVB?

Not yet.

... We're at 270, now. Oh, ooops. Where is it. ---

Right over Florida.

Okay. Good shape, man ---

Are we?

You look good, good, good, good. Good job. Right in there, babe. Yes, that's good. Oh, look at that.

Take pictures with the cameras.

Yes.
... on the TV.

No, forget the TV. The TV looks okay. Get the camera over here and take some pictures.

-- Houston. Would you give us OMNI Bravo?

OMNI Bravo.

Okay, I'm going to give it a little plus-X.

Okay.

Going to CMC first.

Got a T - good TV picture, Dave?

Yes: ... just a little off to the side, Al?

Hum? ... Okay.

Don't want to get too far away, now.

One, 2, 3, 4.

... TV picture is ...

To the right.

Back on CMC.

Okay. ...?

Yes.

Okay, Houston. It looks like we've got a good LM in there, and we're rolling now, and the opening rates are stopped. You should have the TV.

Roger. We haven't got the picture up here yet. Stand by, and I'll give you a check on that.

Okay.

I can shift that camera if you want, Dave.

No. It would just be ... the orientation the LM has for the attitude.
00 03 25 47 CMP Yes, that is a big bang when you come off of there, isn't it?

00 03 25 50 CDR Yes.

00 03 25 58 LMP Guess we're - what, 50 feet?

00 03 26 04 CMP Take it at f/8.

00 03 26 06 CDR All I've got to look at it is the TV picture.

00 03 26 24 CC -- Houston.

00 03 26 26 CMP Go, Houston.

00 03 26 27 CC Goldstone is receiving the carrier, but we're not getting any signal on the carrier for the TV. Over.

00 03 26 34 CDR Okay, we've got a good picture on the monitor up here. You got the TV switch in the right spot, Jim?

00 03 26 40 LMP Well, it's not in TRANSMIT.

00 03 26 43 CDR What?

00 03 26 44 LMP This switch here should probably go to TRANSMIT.

00 03 26 46 CDR Well, put it -

00 03 26 48 LMP Let's try ...

00 03 26 51 CMP Check those ...

00 03 26 53 LMP Do what? How about S-BAND AUX TV to TV?

00 03 26 57 CDR Yes, sir. ...

00 03 27 08 CDR Hey, we need HIGH GAIN, don't we?

00 03 27 10 LMP You have. I've got ... use HIGH GAIN ... --

00 03 27 11 CMP HIGH GAIN.

00 03 27 12 LMP -- ...

00 03 27 15 CDR Okay.
15, Houston. We're getting a picture now, and the LM is coming in in the lower right-hand corner of our field of view.

Okay. Slew antenna to verify oper - Do you want to do all that, Jim? That's your - Yes, go ahead; take your pictures.

Well --

Of course, ... your pictures. Take your pictures. ...

It was a lot slower than I thought it would be.

Strange.

Yes:

As long as they're getting the picture on the OMNI, I guess there's no hurry to - that we get the high gain up.

Okay, Houston. It looks like we've got a good high-gain antenna. Do you want us to give you the high gain or stay on the OMNI?

*** by.

There's sure a lot of crap flying out --

*** take the high gain, Dave.

Roger. Going HIGH GAIN.

Okay, Houston. We're in AUTO and MEDIUM. Looks like we got a good lock.

Roger. And we're getting a very good picture here.

Okay.

Get the DAC going.
00 03 29 08 CC *** on the right-hand side of the field of view.
00 03 29 19 LMP Shall I put the TV ... long, Dave.
00 03 29 22 CDR Huh! I think it looks good, Jim.
00 03 29 26 LMP I can adjust it and get it in center.
00 03 29 29 CDR No, it's - ... How're you doing?
00 03 29 39 LMP How many pictures --
00 03 29 40 CC *** Houston. Request WIDE BEAM width, please.
00 03 29 42 CDR WIDE BEAM.
00 03 29 43 CMP I find I'm working the stick a lot more than I thought I would.
00 03 29 47 LMP Yes.
00 03 29 48 CDR Just play it cool. We've got plenty of time.
00 03 29 51 CMP Yes.
00 03 29 52 LMP Play it cool.
00 03 29 54 CDR Six on your camera would be right where you'd want it.
00 03 29 56 LMP Okay.
00 03 30 29 LMP ... 
00 03 30 35 CDR Okay. I would say we were - what, Jim? 20 feet? 15? 10?
00 03 30 40 LMP I have 15 feet on the camera.
00 03 30 46 LMP Did we forget anything on that checklist, Dave?
00 03 30 49 CDR ...
00 03 30 54 CMP Okay. We're sliding in there, David.
00 03 30 56 CDR Okay. I think we're about a couple feet away.
00 03 31 03 CMP Yes.
What do you want to do?
Put it at 12 frames per second.
Okay, I'd go now if --

*** Houston. The centering on the picture is good now, and we're getting an excellent quality picture.

Very good. We're almost there. I'll be watching above the ... over here.

Okay.
Okay.
..., Jim.
Feel it.
Got it?
About there.
...
Help you?
...
Capture. FREE.
Okay?
Read the checklist, Jim.
Okay; let's go down the checklist. You get ...
Okay. On capture, changing FREE, to damp, aline pitch and yaw -

Still got a little pitch rate going.
...
...
Huh?
You're fine. Just aline pitch and yaw.
Okay.

They're all aligned and damped out?

... on the chart. ...

Okay. Looks like we're damped.

Okay; ready?

We're off at a little bit of an angle.

Here. I can hold this a minute. ...

Okay, Dave.

Yes. ... Ready to retract?

Okay.

Your rate's going? Don't mess around.

Hard dock, Houston. Hard dock.

Great!

Man alive!

Boy! (Laughter)

I should have told you about that. I forgot about it.

Yes. I'm --

I didn't think we were - it was going to ... that much.

Okay. Let's --

I was expecting it.

Okay; DOCKING PROBE, EXTEND/RETRACT, and talkback's gray.

Gray.
00 03 34 07 LMP SEQUENCE PYRO ARM, two, to SAFE.
00 03 34 10 CMP PYRO ARM, SAFE.
00 03 34 11 LMP SEQUENCE LOGIC, two, OFF.
00 03 34 13 CMP LOGIC, OFF.
00 03 34 14 LMP EDS POWER, OFF.
00 03 34 16 CMP EDS POWER's OFF.
00 03 34 18 LMP CB EDS, three, open.
00 03 34 21 CMP EDS, three, open.
00 03 34 24 LMP DOCKING PROBE EXTEND/RELEASE to OFF.
00 03 34 27 CMP OFF.
00 03 34 28 LMP DOCKING PROBE RETRACT, two, OFF.
00 03 34 30 CMP Two, OFF.
00 03 34 31 LMP CB DOCKING PROBE, two, open.
00 03 34 34 CMP DOCKING PROBE, open. TAPE RECORDER's going off.

TIME SKIP

00 04 11 55 LMP Okay; I'll cycle the cryo fans.
00 04 11 59 CDR Is that ON and OFF?
00 04 12 01 LMP Yes, ON for a minute.
00 04 12 03 CDR That's right, we got a change for that.
00 04 12 04 CMP You don't need the checklist. You got that silly bunch of junk. Garbage, rather.
00 04 12 15 CDR Okay; load RCS DAP. Al, you want to load your DAP?
00 04 12 20 LMP Oh, let's see. We need to load --
00 04 12 21 CMP Yes.
00 04 12 22 CDR ... 21101.
00 04 12 31 CDR And Xllll.
00 04 12 33 CMP Yes.
00 04 12 35 CDR Load NOUN 22 attitude. Monitor APS maneuver, ...
00 04 12 40 LMP Okay; what's the attitude?
00 04 12 42 CDR 090?
00 04 12 46 CMP Yes.
00 04 12 47 CDR 257. Okay. ...
00 04 12 51 CMP I don't think you can --
00 04 12 52 CDR Okay; 354.6. Okay; VERB 60 ENTER.
00 04 13 01 CMP VERB 60?
00 04 13 02 CDR Sixty.
00 04 13 04 CMP Okay.
00 04 13 05 CDR VERB 63 ENTER.
00 04 13 07 CMP Okay.
00 04 13 08 CDR GDC ALIGN.
00 04 14 08 CMP GDC's alined.
00 04 14 09 LMP Okay; DET, RESET.
00 04 14 14 CMP Whoops! RESET.
00 04 14 16 LMP CB, SEQUENCE ARM, two, closed.
00 04 14 18 CMP ARM is closed.
00 04 14 19 LMP Okay. Cue MSFN, because we'll be getting the LOGICs on the ARM pretty soon.
00 04 14 24 CMP Okay. Houston, 15.
Roger, Gordo. We're ready to get the PYRO ARMs and LOGICs on now.

Okay; LOGICs coming on. LOGIC 1. LOGIC 2.

Roger. Okay?

SEQUENCE PYRO ARM, two, go to ARM.

PYRO ARM coming on. They're on.

Okay; TVC SERVO POWER number 1 to AC 1/MAIN A.

AC 1/MAIN A.

RHC and THC armed.

RHC and THC armed.

Okay; call P47.

Yes. Okay. Let me put a belt on here to just strap myself down a little bit.

Yes. That's a good idea.

Yes, we're going to be right on that time, at 4:16.

Got much left to do?

Here it is.

... --

Yack!

You hold that side, and I ... --

Can you see it?
... this side. ... Here ... get these to your side.

Yes.

Okay, Jimmy.

Okay; call P47.

Okay.

EMS MODE, NORMAL.

NORMAL?

Okay. And whenever we get P47 eliminated there, we're ready for S-IVB/LM SEP, on, up.

Okay.

Start the DAC.

What?

The DAC. Yes.

How about the settings on the DAC?

... okay; we won't need ...

All right.

Jim, let's turn the page here ... see what we're going to do.

Oh, okay.

Now you're going to go over and start the DET.

Right.

CMC MODE - We do SEP; start the DET; CMC MODE, AUTO; and, at 5 seconds, thrust minus-X for 3 seconds.

Okay. Coming up ...?
5 seconds.

Yes, 5 seconds. ...

I'll hit the SEP, and you get the DET started.

Okay; when you're - when you're - on my mark, you hit the SEP and I'll hit the DET. Ready?

I don't think I am.

Okay.

Okay.

Want to do it on the minute?

Yes, do it on the minute.

All right.

Okay, Houston, we'll SEP at 4:18.

... Stand by.

Boy, look at that.

Five - 5 seconds.

Okay. Okay.

We got a SEP.

We're in AUTO.

Five seconds -

How much now?

One foot --

Three seconds. ... Okay.

Yes.

We've done it.

Okay, Houston. We got a good SEP.
<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 04 18 19</td>
<td>LMP</td>
<td>Okay; you can PRO on that display.</td>
</tr>
<tr>
<td>00 04 18 22</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>00 04 18 23</td>
<td>LMP</td>
<td>You have to go into POO. Then when the activity light's out, you can key VERB 66. Okay, Al, you ready to clean it up?</td>
</tr>
<tr>
<td>00 04 18 31</td>
<td>CMP</td>
<td>Yes.</td>
</tr>
<tr>
<td>00 04 18 32</td>
<td>LMP</td>
<td>SEQUENCE PYRO ARM, two, to SAFE.</td>
</tr>
<tr>
<td>00 04 18 34</td>
<td>CMP</td>
<td>SAFE.</td>
</tr>
<tr>
<td>00 04 18 36</td>
<td>LMP</td>
<td>SEQUENCE LOGIC, two, OFF.</td>
</tr>
<tr>
<td>00 04 18 37</td>
<td>CMP</td>
<td>LOGIC's OFF.</td>
</tr>
<tr>
<td>00 04 18 39</td>
<td>LMP</td>
<td>CB SEQUENCE ARM, two, open.</td>
</tr>
<tr>
<td>00 04 18 41</td>
<td>CMP</td>
<td>ARM is open.</td>
</tr>
<tr>
<td>00 04 18 42</td>
<td>CDR</td>
<td>Okay; Al, check and see if it's clear.</td>
</tr>
<tr>
<td>00 04 18 45</td>
<td>CMP</td>
<td>Okay. I can't see a thing except the LM there.</td>
</tr>
<tr>
<td>00 04 18 56</td>
<td>LMP</td>
<td>I can't either, Dave.</td>
</tr>
<tr>
<td>00 04 18 57</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>00 04 19 02</td>
<td>LMP</td>
<td>You got SEQUENCE ARM, two, open?</td>
</tr>
<tr>
<td>00 04 19 03</td>
<td>CMP</td>
<td>ARM is open.</td>
</tr>
<tr>
<td>00 04 19 04</td>
<td>LMP</td>
<td>CB S-IVB/LM SEP, two, open. That's my side, not yours.</td>
</tr>
<tr>
<td>00 04 19 05</td>
<td>CDR</td>
<td>Yes.</td>
</tr>
<tr>
<td>00 04 19 20</td>
<td>LMP</td>
<td>Now verify O₂ TANK ISOLATION valve move to gray.</td>
</tr>
<tr>
<td>00 04 19 25</td>
<td>CDR</td>
<td>Hey, I can see the Rover, Jim.</td>
</tr>
<tr>
<td>00 04 19 27</td>
<td>LMP</td>
<td>Can you?</td>
</tr>
<tr>
<td>00 04 19 28</td>
<td>CDR</td>
<td>Yes.</td>
</tr>
<tr>
<td>00 04 19 29</td>
<td>CMP</td>
<td>You mean it's there?</td>
</tr>
</tbody>
</table>
90 04 19 30  CDR  Yes, man.
90 04 19 31  LMP  Is it really?  Okay.
90 04 19 37  CDR  Okay. Keep it moving.
90 04 19 41  CMP  What, Jim?
90 04 19 42  LMP  Give me your checklist.
90 04 19 44  CMP  Oh, yes, I can't get this doggone thing ...
90 04 19 48  CDR  Just put it down there and let's keep it going.
90 04 19 50  CMP  Okay.
90 04 19 55  LMP  Okay - Read to me. I've got to get down in the
90 04 20 00  CMP  SIM bay.  ...  Here, I can probably do that easier than you can.
90 04 20 02  LMP  Let me take - Why don't we configure our helmets
90 04 20 05  CDR  and gloves off?
90 04 20 06  CMP  Huh --
90 04 20 07  CDR  Yes, why not?
90 04 20 08  CMP  Well, we do a maneuver here, don't we?
90 04 20 09  CDR  Yes. We've got to do a maneuver to the S-IVB.
90 04 20 11  CMP  Let's get through this thing.
90 04 20 13  CMP  We're already doing attitude.
90 04 20 14  LMP  Okay.
90 04 20 17  CMP  That should take only a VERB 49, since we've
90 04 20 19  CDR  already loaded it.
90 04 20 19  LMP  O\textsubscript{2} tank 3 ISOLATION valve talkback gray.
90 04 20 21  LMP  That's verified.
90 04 20 21  CDR  Okay, MAP, PAN, and SM/AC POWER should be OFF.
I'll get them. You're in all of that junk --
00 04 20 27 LMP No. Well, now-
00 04 20 29 CDR You've got all that junk on; I don't want you to scratch your helmet.
00 04 20 32 LMP Okay. Yes, take care of my helmet for me.
00 04 20 35 CDR You've got to.
00 04 20 36 LMP Yes.
00 04 20 37 CDR So you can see.
00 04 20 38 LMP That's right. Here, if you're going to get down, I'll read to you.
00 04 20 45 CDR Okay.
00 04 20 49 CMP I'm going to take my helmet off.
00 04 20 51 LMP The first one is MAPPING CAMERA, ON, to OFF.
00 04 20 58 CDR MAPPING CAMERA, ON, to OFF. Okay.
00 04 21 03 LMP And the PAN CAMERA POWER, OFF.
00 04 21 07 CDR PAN CAMERA POWER to OFF. Okay.
00 04 21 17 LMP SM/AC POWER; OFF. Down on 181.
00 04 21 26 CDR POWER to OFF.
00 04 21 28 LMP And, Al, LAUNCH VEHICLE SPS INDICATOR switch to GPI.

TIME SKIP

00 09 27 26 CDR Okay. GROUP 5, MAIN A and MAIN B on 226 ...
00 09 27 33 LMP Okay. Both those are open.
00 09 27 59 CDR Okay. Stand by.
00 09 28 16 CDR Okay. Count.
00 09 28 42 CDR Okay. I understand. Standing by.
00 09 28 49  CDR  Eight - 8.983.
00 09 29 02  CDR  HIGH GAIN, MEDIUM.
00 09 29 22  LMP  ...
00 09 29 28  CDR  No. No. It's not under EMS.
00 09 29 30  LMP  ...
00 09 29 31  CDR  What?
00 09 29 33  LMP  ...
00 09 29 37  CDR  No, we're not. We're talking about GROUP 5, on 229.
00 09 29 42  CMP  ...
00 09 29 47  CDR  No, he's also - he's talking about pilot valves.
00 09 29 49  CMP  Oh, he is? ... circuit breakers ... That light.
00 09 30 05  CDR  Huh! EPS GROUP 3. He said GROUP 5.
00 09 30 14  LMP  He said GROUP 5?
00 09 30 15  CDR  GROUP 5. It's GROUP 3 here. That's not what he's working on. He's working on the DELTA-V thrust. 8.983.
00 09 30 24  CMP  229, GROUP 3.
00 09 30 37  CDR  Huh!
00 09 30 57  CDR  Okay. We'll do a - we - we note that drawing 8.9 Echo 3 doesn't seem to fit what you're doing.
00 09 31 25  CDR  Oh, okay. Okay. Shoot!
00 09 31 36  CDR  Okay. Here goes DELTA-V A now. Okay. A is up in on, and the SPS THRUST light is off.
00 09 31 51  CMP  It is? Gee! Good grief!
00 09 32 07  CDR  That's correct. It's still in the up and on position, and when I went to the on position, up, the light went out. I'll just leave it there while you think about it.

CONFIDENTIAL
Wonder why it'll do that?

(Snicker) I can only think of one reason — that it's really in backwards. Did you cycle those switches ..., Jim?

Aah -

Yes, you did - pulled the circuit breakers out to see if the light would change any.

Yes.

I think I would've, too. But he --

... contact ... that contact - (laughter). That's amazing. No. In either position, though, the light should come on.

A is OFF, and the light remains off. Momentary.

Huh! Is the light still off?

It's a switch problem. Yes, the light's still off. I bet it was a - when we did that SEP, bet we got a little solder ball in that switch or something.

Bet we did, too.

Roger. Bravo is up and on; the light is off. Now Bravo is OFF and the light remains on [sic].

Change out the switch.

Huh?

All we got to do is change out that switch.

Yes. All we got to do is bring that bank on late, and turn it off early.

Yes, unless you get a contact in there, we wouldn't have the ignition signal, though.

(Snicker) Roger.

The good thing about it, though, is that apparently the SPS THRUST light - THRUST light works okay.
00 09 37 44 CMP Yes.
00 09 37 45 CDR And that's - your cue. You know, all you need, I guess, is the ignition signal - when the light's on.
00 09 38 00 CMP Yes. Right now ... give guidance the ignition signal.
00 09 39 50 CMP Aaah - Whooo! ...
00 09 39 54 CDR I think you're about checked out.
00 09 39 59 CMP I'll do one more.
00 09 40 17 CMP O₂ FLOW.
00 09 41 12 CMP Whoo. ... much of that crap.
00 09 41 16 CDR You feel pretty good about those?
00 09 41 17 CMP Yes.
00 09 41 19 CDR Good.
00 09 41 23 LMP He's doing all that.
00 09 41 24 CMP You better believe it!
00 09 41 25 CDR You want that optics calibration, don't you?
00 09 41 27 CMP Uh-huh. What's the attitude?
00 09 41 35 CDR Okay, the attitude is - well, wait until you get to POO and you can do a little work on it.
00 09 41 48 CDR Okay, now, the attitude of VERB 49 to - it's 210, 339, 330. Okay. Going CMC, AUTO.
00 09 42 07 CMP Okay.
00 09 42 20 CDR A long way to go. 142 ... up to ... start the UVs. ... 
00 09 42 39 CMP Yes, we've got several of those.
00 09 42 55 CMP ...
You ready for the UV stuff there, Dave? Well, I'm not quite through (yawn) with my stuff though. ...

So you have black on one side and white on the other.

Yes, ...

Roger. It'll work. Good. It just came on. Would you believe? It came on.


Okay. Don't change it all, Al, to Bravo 1. Cycling several times through the middle.

Okay; right in the center of the contacts with A, right between the two, I can get the light to go out. But now, when I go on up to up and on, the light comes on again. And, now I've come back to the OFF position and the light's off. So, I think you've isolated your problem.

Think so, too. That just says we're going to have to use - ban - bank B this time.

It says you're going to have to pull the circuit breakers on A.

Yes.

Before the shutdown.

Yes. Well, either that or - yes, that's right, see.

Because if it doesn't, there's no guarantee the switch is going to do you any good.

That's right. Okay, we got an ap - optics calibration here? What - what star is it?

We're at that attitude now.

Oh, okay. That's - star number 1.

Star number 1 again, huh? Okay.
Okay; we should be looking right at it.

Why do we get -

I don't - I don't know why I get an ignition. We got the light on, but that doesn't say we have an ignition signal. Threw that switch. How could that switch affect the ignition signal unless it was there from someplace else?

Yes. Hey, that's right.

The switch can't produce an ignition signal without something else producing the ignition signal. It sounds to me like the light circuit breaker switch.

Yes.

You know they took the FCSM out.

I know it.

... they really got a complicated system.

Okay. DELTA-V THRUST verified OFF. PILOT VALVES verified open, and we'll close the GROUP 5s.

Okay. We're done - 20C.

Okay, let's go to UV then. Jim, watch the Itek.

Roger. Houston. Stand by.

What are the angles in the Flight Plan? Isn't that where we're supposed to do this?

Says "OMNI D, HIGH GAIN, minus 33 and 213."

Check out 1, 2. Minus 33 and 214. 211 is what the DSKY says. Close enough.

That's real.
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 10 36 38</td>
<td>CDR</td>
<td>Yes, ... Ooosh.</td>
</tr>
<tr>
<td>00 10 36 46</td>
<td>CMP</td>
<td>There, David.</td>
</tr>
<tr>
<td>00 10 36 52</td>
<td>CDR</td>
<td>All I got to say, Al, is good luck.</td>
</tr>
<tr>
<td>00 10 36 56</td>
<td>CMP</td>
<td>Good luck with what?</td>
</tr>
<tr>
<td>Time</td>
<td>Caller</td>
<td>Text</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>01 08 03 06 CMP</td>
<td>Yes. And where's the Hasselblad that's got another - got another adapter on it? Oh, it's just this - son of a bitch right through here.</td>
<td></td>
</tr>
<tr>
<td>01 08 03 42 LMP</td>
<td>Where you going to plug that other end in, lineman?</td>
<td></td>
</tr>
<tr>
<td>01 08 03 44 CMP</td>
<td>Huh?</td>
<td></td>
</tr>
<tr>
<td>01 08 03 45 CDR</td>
<td>Where you going to plug that other end in? You have a place down there?</td>
<td></td>
</tr>
<tr>
<td>01 08 03 50 CMP</td>
<td>Oh, yes, yes, yes, yes, yes.</td>
<td></td>
</tr>
<tr>
<td>01 08 03 53 CDR</td>
<td>Where?</td>
<td></td>
</tr>
<tr>
<td>01 08 03 55 LMP</td>
<td>That's such a longer cable, though, ... Put --</td>
<td></td>
</tr>
<tr>
<td>01 08 03 58 CMP</td>
<td>Yes. Hmm.</td>
<td></td>
</tr>
<tr>
<td>01 08 04 05 LMP</td>
<td>The only place that plugs in is over here in the girth bay, isn't it?</td>
<td></td>
</tr>
<tr>
<td>01 08 04 09 CDR</td>
<td>Yes.</td>
<td></td>
</tr>
<tr>
<td>01 08 04 10 CMP</td>
<td>Well, how the hell do we put a PCM cable in this thing, then?</td>
<td></td>
</tr>
<tr>
<td>01 08 04 14 CDR</td>
<td>But your MAG isn't on your - You haven't got a MAG on right now.</td>
<td></td>
</tr>
<tr>
<td>01 08 04 18 LMP</td>
<td>Be very --</td>
<td></td>
</tr>
<tr>
<td>01 08 04 19 CMP</td>
<td>Okay.</td>
<td></td>
</tr>
<tr>
<td>01 08 04 20 LMP</td>
<td>-- careful then.</td>
<td></td>
</tr>
<tr>
<td>01 08 04 21 CMP</td>
<td>I have been, too.</td>
<td></td>
</tr>
<tr>
<td>01 08 04 25 CDR</td>
<td>Look it over.</td>
<td></td>
</tr>
<tr>
<td>01 08 04 26 LMP</td>
<td>Oh, my God.</td>
<td></td>
</tr>
<tr>
<td>01 08 04 31 CDR</td>
<td>Fooling with your pocket's not ...</td>
<td></td>
</tr>
</tbody>
</table>
Another thing you've got to check in getting this thing on is maybe procedures.

That's right. You always find --

Yes.

-- operations to verify.

Okay.

Yes. You got to crank it around once.

Well, we should now make contact.

Press on.

Found ... TV ...

Which one?

There?

...

Okay.

Okay. That's all right.

Hmm!

There you go. ...

Tool.

Hmm?

Here. ... Let's see your MAG. Looks all right. Not going in that sprocket.

Yes, it looks like it's tight back here.

...

It wasn't - it wasn't before.

No, I guess it - again.
01 08 06 16  CDR  Egad.
01 08 06 21  LMP  ... I've never put that thing --
01 08 06 23  CMP  God damn it - there - I -
01 08 06 26  LMP  Must be another cable ... --
01 08 06 27  CMP  Connector right here.
01 08 06 28  LMP  There must be another cable.
01 08 06 29  CDR  Yes, there is.
01 08 06 34  LMP  You remember that fit check?
01 08 06 35  CMP  Oh, shit.
01 08 06 36  LMP  The vehicle with the --
01 08 06 38  CMP  Yes.
01 08 06 39  LMP  -- with the camera down there on the sextant?
01 08 06 40  CMP  Yes?
01 08 06 42  CDR  You remember who took --
01 08 06 43  CMP  I didn't - No, I didn't do that.
01 08 07 01  CMP  Yes, this is the EL --
01 08 07 03  CDR  Jim, don't you want to --
01 08 07 04  CMP  -- PCM.
01 08 07 05  CDR  -- use the cables we've got?
01 08 07 08  LMP  ...
01 08 07 16  LMP  Will those cables hit - hook together?
01 08 07 20  CMP  No.
01 08 07 21  LMP  Fit together.
01 08 08 27  CDR  Maybe we better do it without PCM.
Yes, it's a shame. That PCM thing. (Sigh) That's -
That's really something.
Could have sworn that goddam thing was right right here.
No, there's never been one there. The only place they've ever been --
Let me have it.
Yes.
-- was down behind the rock boxes, but you won't reach that either.
No, you just don't reach that either.
There's - there's one behind each rock box.
Yes?
But that's - that's too long for that cable, too.
That's too - Yes, that's right. Too long for the cable.
Too long for that one. ...
In there?
No.
Look behind the screen.
CDR's food locker! No. We don't have a CDR's food locker, do we?
Well, that's one of those little things I just never had - for one reason or another, never had checked out, I guess.
I thought you had.
I thought I had, too.
What?
CONFIDENTIAL
01 08 10 47 CMP
Thought I'd looked at everything.

01 08 10 48 CDR
Not the cameras. ... camera up.

01 08 10 57 LMP
Well, maybe we better press on through.

01 08 10 59 CMP
Yes, okay. Let's do without it.

01 08 11 01 LMP
Okay. Exposure's supposed to be here on 1/500th.

01 08 11 13 LMP
... PCM.

01 08 11 15 CDR
How do you get PCM out of the DAC?

01 08 11 17 CMP
Okay. 1/500ths.

01 08 11 18 LMP
Twenty-four fra - frames per second?

01 08 11 20 CMP
Right; 24.

01 08 11 22 LMP
You want to shoot 5 percent of the MAG? You got MAG H on there?

01 08 11 26 CMP
MAG H. That's correct.

01 08 11 29 LMP
You want to record the percentage. I guess, right now, it's 100 percent.

01 08 11 34 CDR
Can't even see 5 percent on that thing.

01 08 11 38 CMP
Yes, it's about 95 percent.

01 08 11 41 CDR
You can time it, Al. Take 5 percent of the total, times the 24 frames per second.

01 08 11 45 LMP
Yes, you got it --

01 08 11 46 CMP
Okay.

01 08 11 47 LMP
-- for 2 seconds.

01 08 11 48 CMP
Okay. Yes.

01 08 11 49 LMP
You got it for 2 seconds.

01 08 11 50 CMP
Huh?

01 08 11 51 LMP
It calls for 2 second's worth at 24.
CONFIDENTIAL

01 08 11 52 CMP Two seconds?
01 08 11 53 LMP Yes.
01 08 11 54 CMP Oh, okay.
01 08 11 55 LMP No, the next step is UTILITY POWER, ON.
01 08 11 58 CMP Okay —
01 08 11 59 LMP ...
01 08 12 00 CMP -- UTILITY POWER is ON. Okay.
01 08 12 03 LMP I guess you need that. Roger.
01 08 12 04 CMP You want 2 seconds at 24 frames.
01 08 12 06 LMP Well, let me read - Yes, that's what it calls for.
01 08 12 08 CDR ... That's not 5 percent. Where do you get the
5 percent?
01 08 12 17 LMP Twenty-four ... is this here. ...
01 08 12 21 CDR Oh, about ... seconds ... We got a bunch of
brange - a bunch of changes to make here, Al.
01 08 12 27 CMP Oh, okay.
01 08 12 28 LMP You're not ready to run.
01 08 12 29 CMP Okay.
01 08 12 30 LMP What you want next is disable jets A-3, B-3, C-4, and D-4.
01 08 12 35 CMP Okay. That gets the - the dark stuff out of the
way. Okay, yes, that's --
01 08 12 40 CDR Okay, here we go, A -
01 08 12 41 CMP -- protective.
01 08 12 42 CDR Read them again.
01 08 12 43 LMP A-3.
01 08 12 44  CDR     Yes.
01 08 12 45  LMP     B-3.
01 08 12 47  CDR     A - A-3 and B-3?
01 08 12 50  LMP     Yes, Bravo 3.
01 08 12 51  CDR     B-3.
01 08 12 52  LMP     C-4?
01 08 12 56  CDR     Bravo or Delta?
01 08 12 58  LMP     No, the last one was Charlie 4.
01 08 13 01  CDR     Okay, Alfa 3, Bravo 3, Charlie 4 -
01 08 13 04  LMP     Dog 4.
01 08 13 06  CDR     Dog 4. Okay, they're disabled.
01 08 13 09  LMP     Then we call P52.
01 08 13 11  CDR     Oh, okay. Okay.
01 08 13 17  LMP     We have to PROCEED there until we get the NOUN 70 display.
01 08 13 21  CDR     Yes.
01 08 13 22  LMP     We want all zeros in there.
01 08 13 23  CDR     Want to set all zeros in there? Okay.
01 08 13 29  LMP     And then we have some - a load for NOUN 88.
01 08 13 31  CDR     Yes, right. Okay.
01 08 13 38  LMP     Okay, NOUN 88.
01 08 13 40  CDR     Yes. Read them off.
01 08 13 41  LMP     Minus 10820.
01 08 13 46  CDR     Go.
01 08 13 47  LMP  Minus 79037.
01 08 13 51  CDR  All right.
01 08 13 52  LMP  Minus 60300.
01 08 13 59  CMP  Before we blow it, let's make sure that there's no PCM cable that'll really -
01 08 14 05  LMP  Okay, we - we got a few more steps to do here any- way. Verify the - -
01 08 14 08  CMP  Houston, 15.
01 08 14 10  LMP  Wait a minute.
01 08 14 18  CMP  Okay. With the sextant photo test here, we have a call for a PCM cable, and the only ones we have on board will not reach the connectors over by the right-hand girth shelf. Do you have any suggestions on how we can get the DAC connected to the PCM?
01 08 14 42  CMP  Okay.
01 08 14 45  LMP  Okay, Al, you can verify through the sextant, if you can, that the optics are boresighted on the target.
01 08 14 53  CDR  Okay. We want to proceed on this display, right? Okay.
01 08 15 15  CDR  Okay, now I'm going down to the station there and see if I can see that -
01 08 15 58  CDR  Yes, that one's right.
01 08 16 06  CMP  Okay, Jim.
01 08 16 08  LMP  Okay, G&N POWER AC on panel 5 comes off.
01 08 16 12  CDR  Yes, you want to turn G&N POWER off?
01 08 16 15  LMP  It's off.
01 08 16 16  CDR  Okay.
And mount the DAC on the sextant.

Okay.

Then we're ready to dim interior lights; then you can turn the DAC on, 24 frames per second for 2 seconds.

Twenty-four frames per second for 2 seconds, you want? Let's wait until we get an answer from them on the PCM.

Yes.

Yes. Here's a cap comes right here. It's ...

That came out of the - that's the electrical connector for the suit.

Yes.

The cover. If you'd just find my spoon, I'd be a lot happier.

Yes.

Why don't you put that in your pocket and then put on suits when we get the PRDs up.

Yes.

Okay, Al. Another thing after this - Then you change the time and, 1/60th of a second, you take one frame at 60 - 60 seconds exposure time, one frame at 20, one frame at 5, and one frame at 1.

Okay.

Let's see. You want - Let's see. You want ...?

I don't care.

... seconds ... watch.

Yes. We want to turn out as many lights as we can.

Yes, let me put the shades up then.
Okay.

Put all the shades up and turn out all the lights inside.

We came all the way out here for some poor guy, we might as well try and do his experiment right.

Is this for "Dim Light" Dunkelman?

Yes. Bob Mercer.

Oh, yes.

Try and do it right.

You sure that other cable won't work on that camera? The one for the EL?

No.

Let's try it.

Try it and see. It's -

This here?

It's always been my understanding that it wouldn't. It's not long enough anyway, I don't think.

We really can't do a thing.

See if it'll hook to the bottom one.

No, it's too short.

Certainly.

Shit, it's not even close.

Sure.

Sure.

You can't - can't fit them together.
God damn it, there's an outlet down here somewhere.

Maybe that'll go behind the - rock box, Al.

Huh?

Fit - will that fit on the camera though? Will this piece go onto the camera?

I think that's the same kind of connection as on the - on the Hasselblad.

Yes.

There you go, behind the rock box. Jawohl. Yes.

That seems like a -

That's a hell of a thing to have to do, but I think there's one in - back there. I remember seeing it during checkout. Right there. There's one way back in there.

Well, there used to be one back here.

Yes.

SCIENCE INSTRUMENTATION, 162.

How about that.

That's - see? It's not long enough to go there. (Laughter).

You're kidding.

Uh-uh.

How about just - Isn't there one on the other side, Dave?

Yes, but it's - There is, but if it's not long enough to go on this side, it certainly won't go on the other side. Does that look that kind like -

That's the G&N.

Yes.
Does that look like the right kind of plug, anyway, Al?

Yes. Yes, it does.

Houston, 15.

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

Okay, I'll voice-record shutter opening and shutter closing. We'll do that. What's the number of that panel down there, Al?

162.

Okay; and be advised, we also tried to get it to panel 162 without success. It was too short for that one, too.

... panel 162.

Well, we did everything we could.

Move the rock box for me, please.

Nothing else you can do? You tried.

Yes, I never thought about the - juice that thing down here in the LEB.

Okay, Jim, let's get on with it here.

Turn down the lights. Your first one'll be for 2 seconds.

Okay. Let me make sure I got all the right stuff set up here - 1/24th [sic] and 1/500th.

Jim, make sure your tape recorder's going. You record the starts and stops like nobody does.

That right? Yes, I will.

Tape recorder's moving.
01 08 23 45 CMP    It is moving?
01 08 23 46 LMP    Yes.
01 08 23 47 CMP    Okay; you ready?
01 08 23 49 LMP    Yes, I'm ready. Two seconds.
01 08 23 50 CMP    Okay. Okay, 2 seconds. Count now, one, 1000; two, 1000; OFF.
01 08 23 57 LMP    Okay. Change to time and - 1/60th.
01 08 24 01 CMP    Okay.
01 08 24 03 LMP    Time and 1/60th.
01 08 24 07 CMP    Okay, it's time and 1/60th.
01 08 24 09 LMP    Okay, and the first one'll be 60 seconds.
01 08 24 12 CMP    Okay. Have you got the clock running there? You can --
01 08 24 15 LMP    Give me a mark, and I'll tell you when to stop it.
01 08 24 17 CMP    Okay, on my mark -
01 08 24 19 CMP    MARK.
01 08 24 49 CMP    I think you'd be better off if you turned that off, Jim. Just -- Can you see the timer without turning that light on? Yes. You going to tell me at 1 minute?
01 08 25 11 LMP    Try it again with the kitchen timer.
01 08 25 13 CMP    Huh?
01 08 25 14 LMP    Try it again with the kitchen timer.
01 08 25 15 CMP    Oh, okay.
01 08 25 16 LMP    Stand by.
01 08 25 19 LMP    MARK.
Okay.

That's on the kitchen timer.

Okay; let's take two of that.

Yes.

At --

Okay -- Why don't you give me a mark, and I'll start the kitchen timer.

Okay. Let me make sure I got this set up right.

That would be a -- Okay.

Okay. You ready?

Yes, I'm ready.

On my mark --

MARK.

When you hear the "ding," why, you can release it.

Okay.

I must say, if that recorder's working okay, I must say that I don't think this photography's going to come out very good because there's an awful lot of bright -- great number of bright particles right out in front of the spacecraft.

Ding.

Okay.

MARK.

Now what's the next one?

The next one's 20 seconds.

Okay. Same - 1/60th?
01 08 27 08 LMP Yes.
01 08 27 10 CDR We want that one much.
01 08 27 30 LMP Standing by for your call.
01 08 27 31 CMP Okay. On my mark -
01 08 27 33 CMP MARK.
01 08 27 50 LMP Stand by.
01 08 27 53 LMP MARK.
01 08 27 54 CMP MARK. Okay.
01 08 27 55 LMP...
01 08 27 59 CMP Okay. What's the next speed there, and time?
01 08 28 02 LMP Next one is 5 seconds.
01 08 28 05 CMP Okay. On my mark.
01 08 28 10 CMP MARK.
01 08 28 12 LMP Okay. Stand by.
01 08 28 16 LMP MARK.
01 08 28 17 CMP Okay.
01 08 28 18 LMP Okay, next one's - 1 second.
01 08 28 21 CMP Okay. One second?
01 08 28 25 LMP One second.
01 08 28 26 CMP Okay.
01 08 28 32 LMP Okay --
01 08 28 33 CMP Hmm!
01 08 28 36 CDR Lucky.
01 08 28 37 CMP That sure does look funny.
Sounds like we got more than one frame.

Huh?

Sounded like you got more than one frame.

Yes, it did.

Do you show it time and 1/60th?

No, I'm at 1 frame per second.

You should have been on time.

All right. I'll take one on time for 1 second.

Well, how about - All the others were okay though? Yes:

Yes, all the others are okay.

Yes. Yes.

That - the last two are going to be - one's going to be maybe a couple of frames at 1 second, or one - or a couple of frames per second - yes, at 1 frame per second.

Well, why don't you just take a 5-second one then?

At 1/60th. Huh?

In other words, you want to repeat the 5 second, too?

No. No.

One frame per second's going to be a lot different from 1 second per frame.

One frame per second is a lot different than 1-second frame.

I know it.

Yes. That's what I'm saying. Maybe we ought to repeat the 5-second exposure.
<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 08 29 39</td>
<td>CMP</td>
<td>No, that should be all right. I did that on time.</td>
</tr>
<tr>
<td>01 08 29 43</td>
<td>LMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>01 08 29 48</td>
<td>CMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>01 08 29 49</td>
<td>LMP</td>
<td>Okay, okay, go back to 24 frames per second.</td>
</tr>
<tr>
<td>01 08 29 53</td>
<td>CMP</td>
<td>Okay. (Sneeze).</td>
</tr>
<tr>
<td>01 08 29 56</td>
<td>LMP</td>
<td>And 1/500th.</td>
</tr>
<tr>
<td>01 08 29 58</td>
<td>CMP</td>
<td>And 1/500th; oo, that's going to be a - Okay.</td>
</tr>
<tr>
<td>01 08 30 06</td>
<td>LMP</td>
<td>And then run the DAC for 2 seconds.</td>
</tr>
<tr>
<td>01 08 30 11</td>
<td>CMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>01 08 30 13</td>
<td>LMP</td>
<td>And then lights up, enable jets, and do a VERB 49 to another target.</td>
</tr>
<tr>
<td>01 08 30 22</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>01 08 30 23</td>
<td>LMP</td>
<td>Don't know what time it is.</td>
</tr>
<tr>
<td>01 08 30 24</td>
<td>CDR</td>
<td>I got them.</td>
</tr>
<tr>
<td>01 08 30 27</td>
<td>LMP</td>
<td>Did you get the jets enabled yet, Dave?</td>
</tr>
<tr>
<td>01 08 30 29</td>
<td>CDR</td>
<td>Coming up.</td>
</tr>
<tr>
<td>01 08 30 32</td>
<td>LMP</td>
<td>Okay, VERB 49.</td>
</tr>
<tr>
<td>01 08 30 37</td>
<td>CDR</td>
<td>Let me make sure I get the right jets, A-3, C-4, B-3, and D-4.</td>
</tr>
<tr>
<td>01 08 30 43</td>
<td>LMP</td>
<td>Right.</td>
</tr>
<tr>
<td>01 08 30 49</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>01 08 30 50</td>
<td>LMP</td>
<td>Give me a VERB 49.</td>
</tr>
<tr>
<td>01 08 30 59</td>
<td>CDR</td>
<td>Okay, 239, 169, 330.</td>
</tr>
<tr>
<td>01 08 31 16</td>
<td>LMP</td>
<td>Okay, 239, 169, and 330. That's wrong.</td>
</tr>
<tr>
<td>01 08 31 23</td>
<td>CDR</td>
<td>Really?</td>
</tr>
</tbody>
</table>
01 08 31 26  CMP  Is that for the sextant or the UV?
01 08 31 30  CDR  We have to do another with the ...
01 08 31 42  CMP  Gee. Well, that's fair enough.
01 08 31 46  LMP  Go maneuver.
01 08 31 48  CDR  Golly, that's a -
01 08 31 54  LMP  And, Al, when we get there, we'll repeat - repeat step 3, yes.
01 08 31 59  CMP  What? With the sextant and stuff?
01 08 32 00  LMP  Yes.
01 08 32 01  CMP  Oh, I thought we were done with it.
01 08 32 02  LMP  No, no, I'm sorry. We got a whole bunch more.
01 08 32 05  CMP  Oh.
01 08 32 06  LMP  -- to do the same thing on another target.
01 08 32 07  CMP  Oh, okay, okay.
01 08 32 09  LMP  Now that you got it all put away.
01 08 32 11  CMP  Sorry about that. Speak up there, James. Okay, we got to maneuver?
01 08 32 19  LMP  Yes, we're maneuvering now. Oh, boy.
01 08 32 33  LMP  I didn't tell you to remove the stuff, Al.
01 08 32 36  CMP  Huh?
01 08 32 37  LMP  I didn't tell you to remove it. Stop.
01 08 32 39  CMP  Tough. Why, we're doing the UV next, James.
01 08 32 45  CDR  Time wise?
01 08 32 46  LMP  We're a little behind. We're at 25.
Day 2

01 08 33 03 CDR UV. By golly. You got to hustle, man. I'll be getting some of that stuff out for you.
01 08 33 44 CDR They want you to take all the MAGs over on this thing.
01 08 33 46 LMP Yes.
01 08 34 11 CMP Want to get all your MAGs out and stuff like that to take over, huh?
01 08 34 15 CDR Yes, since you're down there - why don't you?
01 08 34 20 LMP Get the ones in --
01 08 34 21 CDR R-13. They're almost all in R-13, Jim.
01 08 34 24 CMP Okay. That's all over by Jim there.
01 08 34 26 LMP Yes.
01 08 34 28 CMP I think I can help.
01 08 34 29 CDR A-8 - There are three MAGs in A-8 you can get out, Al. You can get those; S, T, and U.
01 08 34 35 CMP They're in A-8, huh?
01 08 34 36 CDR Yes.
01 08 34 37 CMP Okay. Yes, that's right. Those are those - Hasselblad things, since they're in there.
01 08 34 45 LMP You want me to take these out of R-13 now, Dave?
01 08 34 48 CDR Yes. Let's just get them all ready.
01 08 34 52 LMP Tie them down there on the couch some way?
01 08 34 57 CMP Let's see. How about O, P, and Q?
01 08 35 00 CDR No. Well, all ours are double letters, really, Al.
01 08 35 04 CMP Yes.
01 08 35 05 CDR So anything that's a single letter is yours. So what I'm really looking for is SS, TT, and UU.
Yes, and then you got to have the UV done, the TV out, and be over there for a TV pass in an hour.

That's ... Okay.

We need the jettison bag out of A-2, Al. If you're in that vicinity.

Okay.

Very strange. I don't see any SS, TT -

Well, if it just says "LM S, T, and U," that's good.

Oh, hey, in here. Yes, I guess this is it here. They didn't mark them double. I bet you this is it.

Sorry about that.

Yes, LM S, T, and U.

Yes. Can you get us the jettison bag out of A-2?

Yes.

That your UCTA down there, Jim? Leaking all over.

Is it really?

Where? I don't see it.

Well, I bumped it, and it's just - coming all over me. Okay. Now what do you want out of A-2?

Want a jettison bag.

Okay.

Thank you.

Okay. Now for the ...
Okay. Are we in attitude yet?

No, not yet, Al.

No, we're not there, Al. We've got a ways to go.

Okay.

... I think ...

Fine. That's got it. Okay, we got it. Going to be a ... got on your hands.

We're not there yet. We need utility straps and retainer straps.

I'll be getting those.

Okay.

From where?

Over from R-5.

Huh?

You get those ...?

R-5?

No, we don't need -

Forget it, Al.

Oh, okay. Yes.

Peanuts. Let's really get the big stuff.


And - Got a ways to go. We want to get the LM Data Kit, in R-3. Okay, Ac --

Yes, that's right here.

-- Activation Checklist in R-3. Because - R-3's connected with --
The LM Data Card Kit?

Well, the whole thing. The LM Data Kit should be in there.

Oh, that's it, probably, stored back there.

Is that it?

Yes. Should be Activation Checklist.

You want this all over there, Dave?

Yes.

Activation Checklist.

Why don't we just take the Activation?

Yes, take the other thing when I'm not looking.

Yes.

Just a second.

What say? Put it back up? Yes.

...

Let's see how close we are. Let's see. ...

Yes, I can get it out for you, if you want. Here it is.

...? We got another 30 degrees to go.

All right.

...

Jim, you're absolutely unreadable. I can't make out a word you're saying, usually.

Okay. I got it, Al.

There you go. I can hear you. Got the cables?
01 08 42 29  LMP  Yes. I got them.
01 08 42 30  CMP  Okay. You want the bracket?
01 08 42 35  LMP  No.
01 08 42 36  CMP  This is going to be just hand held.
01 08 42 37  LMP  Taking it over to the LM.
01 08 42 39  CMP  Okay.
01 08 42 42  LMP  Keep watching the monitor.
01 08 42 44  CMP  Yes. Okay.
01 08 42 47  CDR  Hey! How did you ever get L-2 closed, Al?
01 08 42 51  CMP  L-2 closed. I didn't.
01 08 42 59  CDR  Somehow -
01 08 43 04  CMP  I didn't get it closed. I couldn't close it on all those cables. Could you?
01 08 43 10  CDR  No. Not unless I rewind the cables.
01 08 43 12  LMP  Here.
01 08 43 17  CDR  Too much in here.
01 08 43 18  CMP  Yes, there is.
01 08 43 44  CMP  Here.
01 08 44 03  LMP  Hmmm. I don't understand why I can't get A-1 closed.
01 08 44 17  CDR  Huh?
01 08 44 21  LMP  It's got too much in it with the strut that's in the way there. Dave, can you reach down through there and rotate that strut a little bit so that it gets - so that it's - -
01 08 44 32  CDR  Yes.
01 08 44 33 LMP  -- out of the way of the lid of A-l?
01 08 44 38 CDR  No, I can't. I don't know which way to rotate the
darn thing here. It's got to rotate - that's
right - it's got to rotate towards you.
01 08 44 44 LMP  Why don't you ... get that thing?
01 08 44 46 CDR  Mmm.
01 08 44 47 LMP  Get it ... I guess. Better than ... 
01 08 44 51 CDR  No, no, it won't go that way. It won't make any
difference.
01 08 44 54 LMP  ... Get it - get it all the way up ...
01 08 45 06 CDR  Yes.
01 08 45 16 LMP  ...?
01 08 45 17 CDR  No. It doesn't bend that way.
01 08 45 27 LMF  I don't know what there is about that strut there
that - that changed.
01 08 45 39 LMF  Well, something's different there.
01 08 45 41 CDR  There sure is.
01 08 45 53 CMP  The ... attitude. Why don't you do 'that --
01 08 45 54 LMF  Roger, OMNI Delta.
01 08 45 55 CDR  Okay. I want to get my su - want to get my suit
back out of the way. You got to - you got to ro-
tate that strut.
01 08 46 03 LMF  ...
01 08 46 09 CMP  What are you doing?
01 08 46 10 LMF  ... through there.
01 08 46 12 CDR  Yes. Get my suit back out of the way here.
01 08 46 23 CDR  Okay.
Okay, if we're at attitude, Dave, you want to disable those jets?

... 


Okay. They're disabled.

Okay. Call P52.

Okay. Okay.

And we want all zeros and NOUN 70.

Yes.

And the NOUN 88 - we want the same values.

Oh, we do?

Yes.

Oh, yes. Yes, that's right; 108. Okay. Same values, eh?

Yes.

Okay.

It says verify that, through the sextant, that the optics are boresighted on your target. Get G&N POWER on for you.

Okay, we can go to - Let me just make sure I got the same target.

Yes. That's the same one. All right. Up.

G&N POWER going off. Mount the DAC on the sextant.

Yes.

Okay, dim interior lights, and - You on 24 frames per second?

Okay. I am now.
Okay, you want to do --

And - and 1/500th?

Uh-huh. Yes, it'll be 1/500th.

Okay. You want it 2 seconds?

Two seconds, yes.

Okay.

Okay. Change the time to 1/60th.

Okay.

You there?

Yes.

Okay. At 60 seconds, give me a mark and I'll give you a time.

1/60th.

Okay. You in what - now what do you want it now?

Sixty seconds.

First one 60 seconds, huh?

Yes.

Okay.

MARK.

Okay.

You going to give me a mark?

Mmm-hmm.

Okay.

About 20 seconds.
01 08 49 58  LMP  Stand by.
01 08 49 59  CMP  Okay.
01 08 50 03  LMP  MARK.
01 08 50 05  CMP  Okay. I want to do that one again. Ready?
01 08 50 10  CMP  MARK.
01 08 50 15  LMP  Why you doing it again?
01 08 50 17  CMP  Hmm?
01 08 50 18  LMP  Why do you want to do it again?
01 08 50 19  CMP  Oh, I was a little bit leary of that last one. I didn't like the way that shutter sounded.
01 08 51 05  LMP  Stand by.
01 08 51 07  CMP  Okay.
01 08 51 11  LMP  MARK.
01 08 51 12  CMP  Okay. Okay. Next?
01 08 51 21  LMP  The next one is 20 seconds.
01 08 51 23  CMP  All right. You ready?
01 08 51 25  LMP  Definitely.
01 08 51 26  CMP  MARK.
01 08 51 42  LMP  Stand by.
01 08 51 43  CMP  Okay.
01 08 51 46  LMP  MARK.
01 08 51 47  CMP  Okay.
01 08 51 48  LMP  Okay, tell me when you're ready. The next one's 5 seconds.
01 08 51 51  CMP  Okay. I'm ready.
01 08 51 53 LMP Yes.
01 08 51 54 CMP MARK.
01 08 51 55 LMP Okay. Stand by.
01 08 51 59 LMP MARK.
01 08 52 00 CMP Okay.
01 08 52 01 LMP Your next one's 1 second.
01 08 52 02 CMP Okay. Okay.
01 08 52 08 LMP Okay. Then you change to 24 frames per second.
01 08 52 11 CMP Okay.
01 08 52 12 LMP And 1/500th of a second.
01 08 52 16 CMP Okay.
01 08 52 17 LMP Then run the DAC for 2 seconds.
01 08 52 20 CMP Okay. Done.
01 08 52 22 LMP Okay. Enable jets.
01 08 52 25 CDR Okay. Coming on; A-3, Charlie 4, Bravo 3, and Delta 4.
01 08 52 32 LMP Okay. Record the MAG - percentage. Al, did we use 5 percent?
01 08 52 38 CMP Yes, we didn't use any more than that.
01 08 52 40 CDR Select attitude, Jim.
01 08 52 41 LMP Okay. VERB 49 maneuver to the UV photos. ... load them.
01 08 52 51 CDR Okay. Go ahead.
01 08 52 54 LMP Okay. 150, 052, and 033.
01 08 53 06 CDR 150, 052, and 033.
01 08 53 12  LMP  We maneuvering?
01 08 53 16  CDR  What did you get on percentage on the MAGs, Al?
01 08 53 38  LMP  Al, percentage on the MAGs.
01 08 53 40  CMP  Well. It looks to me like it's about - we started out at about 95 percent and we're down to about 90 percent.
01 08 53 49  LMP  Okay.
01 08 53 59  CDR  ... take this ...
01 08 54 09  CMP  Okay. I'm going to put some of those cameras away here. We don't need the pictures any more here, right?
01 08 54 13  LMP  No.
01 08 54 14  CMP  Okay, Dave. Dave, you want to - stash that just for now, and -
01 08 54 19  CDR  Yes.
01 08 54 21  LMP  Still be one more left.
01 08 54 23  CDR  Oh, it'll be a long time.
01 08 54 24  CMP  Yes.

TIME SKIP

01 09 43 05  CMP  Okay. Here it is. Jettison, Jim.
01 09 43 12  LMP  I've got the drogue here, Al, if you can get the TV between my legs.
01 09 43 19  CMP  Okay.
01 09 43 24  CDR  I got the probe, Jim. Let's see, you take the jettison bag. I want to put the probe over here by the hatch.
01 09 43 32  LMP  Okay, I've got the JETT bag.
15, Houston. We'd like to have NARROW BEAM, please.

Tell them NARROW BEAM.

Okay, Karl. You got NARROW.

Thank you.

We go over there yet?

Just a second.

Not yet, Jim. We're not going anywhere yet. There. Okay, now -

Got them lashed down?

Yes, lashed down.

Okay.

Now we need the drogue.

Yes.

It seems to me that - the best thing - Give Jim back that TV. I think we can probably put his drogue also under the couch.

Under Jim's couch?

Well, that's too crowded, but I think under - under here.

Let's see how we might make out. Okay, watch your suit.

Yes.

Change ribbons.

One moment here.

Yes. Did you -

You like AUTO? Or REACQ.
AUTO's fine for what we're doing.

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

Roger, 15. Give us NARROW BEAM, please.

NARROW.

Anything over there, Jim?

Okay, Houston. The LMF is in the LM.

Houston copies.

TIME SKIP

Okay. Did you want me to continue checking? I figured after I - Stand by.

Yes. I thought you checked them all, Jim. Sure. Check them all. Sure.

I understand.

Not yet.

... do this?

Okay. TV.

... 

... That's over ... 

Yes, when I read it out to you. Not before.

Okay, Karl. I've checked all the circuit breakers, and that's the only one that seems to be out of configuration.
Okay, we're standing by.

Yes, that's corrected.

Yaw - our yaw is really ***

Yes, we're in TRACK, AUTO.

The yaw is ***

Just let it go for a while. It's black and it's black.

PITCH is minus 30, YAW is 270, and track is AUTO.

... 280.

You can stop that one someplace.

Okay.

Okay. And right now the yaw indicator is reading about 280.

Yes.

The dial is 280. The thumbwheel is 270.

... 280.

Yes, go ahead.

... try to talk crazy.

This is 15; I read you loud and clear.

Well, nothing, other than that the pitch went to zero, and the yaw decreased just very slightly. And, of course, when you reacquired, why, I think only the pitch went back to 30.

That's right. ...
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<th>Time</th>
<th>User</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 12 56 41</td>
<td>CMP</td>
<td>Yes, I ... turn this PRD in.</td>
</tr>
<tr>
<td>01 12 56 49</td>
<td>CDR</td>
<td>Get the PRD out of there while you're at it.</td>
</tr>
<tr>
<td>01 12 56 51</td>
<td>CMP</td>
<td>Out of - where is it?</td>
</tr>
<tr>
<td>01 12 56 53</td>
<td>CDR</td>
<td>It's in the pocket with yours. ... It's in your cuff - by your - top of your right hand. Ah, I got it.</td>
</tr>
<tr>
<td>01 12 57 01</td>
<td>CMP</td>
<td>Oh, okay. ...</td>
</tr>
<tr>
<td>01 12 57 07</td>
<td>CDR</td>
<td>Is this pad you copied down, Al, is that - the next midcourse, huh?</td>
</tr>
<tr>
<td>01 12 57 10</td>
<td>CMP</td>
<td>No. That's a flyby pad.</td>
</tr>
</tbody>
</table>
02 07 40 01  SC  (Laughter)
02 07 40 03  CDR  Okay, Jim. How do you cycle those?
02 07 40 05  SC  (Laughter)
02 07 40 06  CDR  Okay. MAP CAMERA on to ON for 2 minutes and then OFF, and I'll set the camera.
02 07 40 10  LMP  Okay. We're going to ON -
02 07 40 11  CDR  Okay.
02 07 40 12  LMP  MARK.
02 07 40 13  CDR  The clock is running. PAN CAMERA SELF TEST to on (up). Talkback barber pole, to five frames, and then gray.
02 07 40 21  LMP  Okay. SELF TEST.
02 07 40 24  CDR  And then five. Then you do five frames.
02 07 40 26  LMP  Okay.
02 07 40 27  CMP  ... he doesn't. I think you - you'll - you'll see at 5 - about 5 seconds - and then gray.
02 07 40 34  CDR  Okay. Is it gray?
02 07 40 36  LMP  Not yet.
02 07 40 53  CDR  Still not gray?
02 07 40 55  LMP  No.
02 07 41 00  CDR  It is barber pole?
02 07 41 01  LMP  Yes, it's barber pole.
02 07 41 02  CDR  Did it go barber pole when you put it - put it on?
02 07 41 04  LMP  Yes.
02 07 41 05  CMP  ...
02 07 41 07  CDR  Oh, I see, Al. It does five frames automatically, and then it automatically goes gray.

02 07 41 09  CMP  Yes.

02 07 41 10  LMP  Okay. It's gray.

02 07 41 12  CDR  Good. PAN CAMERA SELF TEST to HEATERS.

02 07 41 15  CMP  We still don't know whether it - what - anything about the craters.

02 07 41 18  LMP  Okay, PAN CAMERA SELF TEST going to HEATERS.

02 07 41 20  CDR  PAN CAMERA POWER to OFF.

02 07 41 22  LMP  PAN CAMERA POWER, OFF.

02 07 41 25  CDR  Okay. After mapping camera - Oh, wait a minute. Stand by for the bell.

02 07 41 30  LMP  Okay.

02 07 41 32  CDR  And when the bell rings, you want to go MAPPING CAMERA to OFF.

02 07 41 36  LMP  Okay.

02 07 41 45  CDR  Oh, boy.

02 07 41 55  LMP  Too bad they didn't put this panel over on Al's side.

02 07 41 59  CDR  I think it'd been a lot easier for him during the flight - or during the - -

02 07 42 01  LMP  Yes.

02 07 42 02  CDR  -- solo time, too.

02 07 42 03  LMP  Yes. Yes, it would have, too.

02 07 42 06  CDR  Probably didn't have the wiring.

02 07 42 08  LMP  Didn't have any room for it ... 

02 07 42 10  CDR  Well, they probably - the wire ... probably were all built for this, you know.
Yup, yup. There you go.

Okay, MAPPING CAMERA going OFF.

MAP CAMERA, OFF. Okay, and then for 1 minute, we
time the MAPPING CAMERA, OFF. And after it's been
OFF for 1 minute, MAP CAMERA goes - the MAP CAMERA,
ON, goes to STANDBY, and we should get a gray talk-
back. And the clock is running.

You have another 49 maneuver, or you want to
recoop -

... that other ... 49 maneuver ... again.

Oh, oh, it says - Well, you get the idea that the -
Let's see - it says secure the high gain antenna.

So why don't we wait?

Okay, Jim. MAP CAMERA, ON, to STANDBY.

Talkback gray.

Okay.

Houston, Apollo 15. That completes the man [sic]
and pap [sic] camera operation. And, if you
approve, we'll secure the high gain and maneuver
to the UV attitude.

Nothing like rubbing it in. (Laughter)

Okay. On the way. Thank you.

What's the attitude there, Jim?

Uh --
DAY 4

03 06 30 22 LMP -- with a ... Minus 35.
03 06 30 25 CDR Roger.
03 06 30 27 LMP You guys got all your oxygen?
03 06 30 30 CDR Yes.
03 06 30 31 LMP Okay.
03 06 30 33 CMP Minus 5 and a PRO, and a DELTA-V thrust of plus 5 ... Okay. PILOT VALVE, open. Everything else looks good.
03 06 30 47 CMP/CDR One minute.
03 06 30 59 CMP Okay. We've got ... here.
03 06 31 13 CMP Average g is on.
03 06 31 19 LMP EMS MODE, NORMAL.
03 06 31 20 CDR EMS MODE's on.
03 06 31 27 CMP And we settle down for the DELTA-V thrust.
03 06 31 29 CDR Yes.
03 06 31 33 CMP Sit back and ... --
03 06 31 34 CDR Looks good.
03 06 31 38 CMP Clear to PRO.
03 06 31 39 CDR Okay. 99 PRO. Ought to be okay.
03 06 31 44 CMP And the DELTA-V THRUST is on.
03 06 31 46 CDR Okay.
03 06 31 47 CMP B valves.
03 06 31 48 CDR IGNITION. 1 --
03 06 31 49 CMP IGNITION.
03 06 31 50 CDR -- 2, 3, 4, 5 --
03 06 31 53 CMP A's coming on. Okay --
03 06 31 54 CDR -- ... there.
03 06 31 55 CMP -- A valves. $P_c$ is reading about 90.
03 06 31 59 CDR Okay.
03 06 32 01 CMP Looks like it's running smooth.
03 06 32 02 CDR ... Okay. The EMS and the DELTA-V and the DSKY look good. And we have tight limits. Very smooth.
03 06 32 35 CDR Okay, the DSKY and EMS look good. Still in the tight limits.
03 06 32 51 CDR A minute, and you're tracking PITCH 41.
03 06 32 56 CMP Hmm! Right on, huh? Okay, the pressure's running 95; holding steady.
03 06 33 05 CDR Okay. Keep going on tight limits.
03 06 33 17 CDR The DSKY and the EMS agree. ... watch for the loose limits?
03 06 33 24 CMP Yes. I should be able to ... loose limits.
03 06 33 27 CDR Okay.
03 06 33 30 LMP Five degrees, Dave. And the balance - unbalance is holding very well. About minus 180.
03 06 33 35 CMP Right on the center of the roll dead band.
03 06 33 37 CDR Dead on it - right on the side of the roll.
03 06 33 39 CMP ... on the roll.
03 06 33 40 CDR Not even on the side. It's only at 4 degrees.
03 06 33 51 CMP We have a PITCH 34. It'll probably stretch out after we go to the single bank insertion.
03 06 33 57 CDR Yes.
03 06 33 59 CMP  Any ... loose limits?
03 06 34 03 CDR  DSKY and EMS agree pretty well.
03 06 34 15 CMP  The DSKY and the EMS are about 12 feet per second
difference - is all. That's pretty good.
03 06 34 21 CDR  Mm-hmm.
03 06 34 23 CMP  ... still no loose limits?
03 06 34 30 CDR  That view meter's not even registering.
03 06 34 50 CMP  Did you get your watch started on time, Jimmer?
03 06 34 52 LMP  We'll find out.
03 06 34 54 CMP  No, I mean, did you?
03 06 34 55 LMP  Yes.
03 06 34 57 CMP  Okay, because we need you to tell us at 6 minutes.
03 06 34 59 LMP  Yes, I will.
03 06 35 03 CDR  How are the pressures looking over there, Jim?
03 06 35 04 LMP  Beautiful. About 170 on both.
03 06 35 08 CDR  Okay.
03 06 35 09 CMP  ... about 18?
03 06 35 10 CDR  No, we're about 12 --
03 06 35 11 LMP  P_C is reading 95 and holding steady.
03 06 35 13 CMP  Are we 12 feet per second -- difference between
the EMS and DELTA-V?
03 06 35 18 CDR  Somebody would chew his ass if it didn't.
03 06 35 22 LMP  P_C is creeping up just a little bit.
03 06 35 25 CMP  Okay, we're tracking PITCH 33.
03 06 35 34 CDR  Okay. Should be approaching the tight limits, Jim.
Okay, you're in tight limits now. About 2 and a half minutes to go.

Okay. We're looking good here.

Okay.

P_c's about to cross over.

P_c's holding about 90 - 96.

Okay, we've had cross over.

Okay.

It crossed a little, but not much.

Hey, listen. Your P_c went up about 2 - about - 2 percent, and it's up to about 98 now.

Okay, the EMS and the DSKY are about 10 feet per second difference. We're at tight limits. About 2 minutes to go. G&N's tracking 638.

Okay.

Five minutes.

Okay. EMS and the DSKY are within about 10 feet per second. Track at 638. Tight limits.

Okay. Give me a countdown at 6 minutes.

Okay.

You want Jim to count down at 6 minutes?

Yes.

You want me to give you a 10-second count?

Yes.

Okay.

A little dead band in there in the roll?
03 06 37 26  CDR  Mmhmm.
03 06 37 28  CMP  Okay, about 10 feet per second difference between
the EMS and the DSKY, and we're looking good.
03 06 37 33  CDR  P_c's varying between about 96 and 98. Looking
good though!
03 06 37 37  LMP  Countdown.  10, 9, 8, 7, 6, 5, 4, 3, 2, 1 -
03 06 37 47  LMP  6 minutes.
03 06 37 48  CDR  Okay.
03 06 37 49  CMP  Can you reach it?
03 06 37 51  CDR  PILOT VALVE A is out. P_c is down to 94.
03 06 37 54  CMP  Okay, we'll need another countdown to the -
03 06 37 56  CDR  Yes.
03 06 37 57  CMP  Shutdown then.
03 06 37 58  CDR  Yes.
03 06 38 00  CMP  Okay. Can you reach them there, Dave?
03 06 38 01  CDR  Yes. About 20 seconds to go.
03 06 38 06  CMP  You've got 10 seconds overburn, don't forget.
03 06 38 08  CDR  Yes.
03 06 38 15  LMP  Start the countdown?
03 06 38 17  CDR  Yes, looks good.
03 06 38 19  LMP  10, 9, 8, 7, 6, 5, 4, 3, 2 -
03 06 38 27  CDR  SHUTDOWN.
03 06 38 28  CMP  Okay.
03 06 38 29  CDR  Automatic. Okay, Jim.
03 06 38 32  LMP  Okay --
03 06 38 33 CMP Oh, we log zero!
03 06 38 34 CDR Look at that.
03 06 38 35 CMP We'll burn them.
03 06 38 36 CDR -- ... Look at that, pal!
03 06 38 37 LMP Did you --
03 06 38 38 CMP Oh, I didn't --
03 06 38 39 CDR (Laughter)
03 06 38 40 LMP Ohh!
03 06 38 41 CMP -- dream any --
03 06 38 42 CDR Look at that!
03 06 38 43 CMP Jim, Jim. Let's clean it up, Jim.
03 06 38 44 LMP Okay -
03 06 38 45 CDR But whoo.
03 06 38 46 LMP Stand by for gimbal motors, Al.
03 06 38 47 CDR Fantastic!
03 06 38 51 LMP Stand by for gimbal motors.
03 06 38 52 CMP I thought I just gave you one.
03 06 38 53 LMP I don't see it.
03 06 38 54 CMP I'll try it again. All right, number one coming off.
03 06 38 59 LMP One, two --
03 06 39 02 CMP Two's -
03 06 39 04 LMP -- three, four. Okay. TVC SERVO POWER 1 and 2, OFF.
03 06 39 09 CMP OFF.
03 06 39 11 LMP MAIN BUS TIE's coming OFF.
03 06 39 12 CDR I can't believe it! I can't believe it!
03 06 39 16 LMP   Yes, sir, that was beautiful.
03 06 39 17 CDR   That was fantastic!
03 06 39 18 LMP   That was beautiful.
03 06 39 20 CDR   That is the best burn I've ever seen and I've seen 10, I mean 11. That isn't real! I've never seen one come out that good.
03 06 39 29 LMP   Well, that's just superior cunning and skill, men.
03 06 39 31 CDR   Yes. It's got to be. Certainly (laughter).
03 06 39 35 CMP   Okay, Jim. Clean up the rest.
03 06 39 37 LMP   Okay, you got all the data? Got the EMS data?
03 06 39 41 CMP   Yes, got that.
03 06 39 42 LMP   EMS FUNCTION's OFF.
03 06 39 43 CMP   Okay, OFF.
03 06 39 44 LMP   EMS MODE to STANDBY.
03 06 39 45 CMP   STANDBY.
03 06 39 46 LMP   RHC and THC; locked.
03 06 39 48 CMP   Locked.
03 06 39 49 LMP   DEADBAND, MAX.
03 06 39 50 CMP   MAX.
03 06 39 51 LMP   TRANSLATION CONTROL POWER, OFF.
03 06 39 52 CMP   OFF.
03 06 39 53 LMP   ROT CONTROL POWER DIRECT, two, OFF.
03 06 39 54 CMP   DIRECT's OFF.
03 06 39 55 LMP   BMAG MODE, three, RATE 2.
03 06 39 56 CMP   RATE 2.
03 06 39 57 LMP CB DIRECT ULLAGE, two, open.
03 06 39 59 CMP DIRECT ULLAGE, open.
03 06 40 00 LMP CB SPS PITCH 1 and YAW 1, open.
03 06 40 03 CMP PITCH 1, YAW 1, open.
03 06 40 05 LMP SPS PILOT VALVE MAIN B, open.
03 06 40 07 CMP MAIN B, open.
03 06 40 08 LMP PCM BIT RATE going LOW.

TIME SKIP

03 08 13 49 CDR -- says it's just ... -- He got word from the back room that Farouk and his boys are ecstatic. And the SIM bay stuff is all working very well.

03 08 14 06 CDR (Laughter) Good old SIM bay working up in there and he's jumping up and down. Well, the tape motion is going as planned. Even a little early. Okay.

03 08 14 36 CDR ...? No, I don't think we have time then ... have to get that ... in. ...? You'll spoil the eat period by messing with the -

03 08 14 54 CDR Okay, 10 minutes before the dump, Jim.

03 08 15 14 CDR Man, is that full.

03 08 15 20 LMP ... DOI.

03 08 15 37 CMP Hopefully, DOI is just going to be a bank B burn. Is that right?

03 08 15 41 LMP ...

03 08 16 13 CDR Houston, Apollo 15; go.

03 08 16 32 CDR Okay. Three photos - You son of a ... bitch! He always stops.

03 08 16 56 CDR I'm going to give Karl about 6 seconds every time, before I answer...
Okay, Houston, understand. Swirls on Crisium, three-photo - photo convergent stereo, f/8, 1/250th, with the 250.

Okay. We'll tell him. You wanted to be reminded about helmets and gloves as you take your shots of Ingenuity on this time. What the hell does that mean?

Okay, thank you, Karl. We will. Huh? See around what ... problem? Oh.

Rather than the glasses? Yes.

... we going to start running our clock ... then at the 180-degree point, too, don't we?

Yes.

... much time is up ...

No. Not yet.

These 250's I guess you take with the brackets, huh? Yes? Out of which window? Center window?

You got a bunch of other ones here. This one's a 33 frames at 15-second intervals. All - all this 250 stuff is - -

Yes. Okay. That's right. That's right. You asked why you brought that bracket along once, didn't you?

Just push that button underneath it, Dave.

Oh. There's a ... Look at that.

...  

Anyone else have a jumney [?] bag they want dumped?

No.

1/250th.
250's already rolling.

You guys want anything to eat?

What?

Yes. Eighty-five pictures, MAG M, frame number 30 which would be frame number 43.

Hey, I think I shorted someone a lemon pudding. A lemon pudding.

I've got one.

I don't think Al has. I've got one over here opened - that Al can have.

I've - I've got one in my pocket I'm going to eat. You want this one?

... And let's don't be hanging stuff up now because we've got another burn coming.

Yes.

Let's get it all taken care of.

Huh? I ate mine.

Then you opened another one, huh?

I thought I had the - the fruit cocktail. Here, throw that in the bag. Thank you.

Well, can we get the - we got to - when we get through all that stuff this evening, let's get all the garbage and take it down to the food locker.

Yes. It's time to dump, isn't it?

Yes. I expect it is. That's all right, we'll close.
03 08 24 09  LMP  Can I dump?
03 08 24 11  CDR  Yes.
03 08 24 13  LMP  Okay.
03 08 24 17  CDR  Dump the waste, too.
03 08 24 31  LMP  Dumped that ... dead band.
03 08 24 34  CDR  The dump?
03 08 24 56  CDR  ... (laughter).
03 08 25 17  CDR  Hey, you got coming up - Sea of Ingenuity, Crisium, Keyhole Crater, The Bright One, and Ibn Yunus - ...
03 08 25 47  CDR  That's - Oh, yes. There's a possibility of 10. And - then you do the realine. You got a lot of pictures to take. Wh - where do you want to take them?
03 08 26 03  CDR  Okay. Why don't you just tell us, you know, which window, and we'll go to wherever -
03 08 26 15  CDR  Oh, okay.
03 08 26 27  CDR  ... five.
03 08 28 01  CMP  Dave, did you say you're doing a waste water dump now?
03 08 28 03  CDR  Yes.
03 08 28 20  CMP  No, I've got another ... for that.
03 08 28 23  CDR  I thought there was one here.
03 08 28 28  CMP  I think you was going to put it on the Flight Plan. Okay. There's one here, Dave.
03 08 29 25  CDR  ... that waste water's something that's got to go. Certainly have a lot of it.
03 08 29 34  LMP  It's probably done.
03 08 29 35  CDR  Huh?
It's probably done.

What --

How can you tell?

It's slow.

Oh, I see. The waste water dump.

Yes.

... a small ...

Got a lots of things to dump?

Here, I'll put that in the bag, Al.

There it is. You got it?

Okay, the urine dump's complete.

Oh, really? All that stuff?

... Yes.

Okay.

What'd you have the timer set up for, Dave?

Waste water dump. To make sure I checked it when it went off.

You dumping down to 15?

Yes. You might just watch it if you're there.

... Al's moving over.

He's ... of you.

Yes. Time to look for more. ...

Jim, you see my scissors up there?

Yes.

Thank you.
That looks good.

We got sunrise. Coming up on sunrise. Yes. Oh, gee. That's bright.

See, you can just barely see the horizon.

See the horizon out there, see it?

Oh, look at that. Isn't that something! Hey, you got to take a picture of that.

Huh? Isn't that something? Oh, boy.

Golly!

Okay. Believe that waste water dump's done. I'll go down and get it.

I'll get it. I'm right here.

Okay. ... down to 20.

Okay. Yes.

Yes. It looks like a snow-covered prairie. And doesn't that look like a brown to you?

Now it does. Yes. Hey, that's — just got to have a picture of that.

Okay.

Wouldn't that make a great Christmas card?

Hey, wouldn't it, though?

Yes, that view right from this window. Look at that.

Yes, it's almost the same over here. Huh? Where's — I can't hear you, Al.

Ring sight.

Yes, there's one — the only one I know of right now — I can get you one. I know where there's one. There's a ridge here, Jim. A prominent
ridge - we're coming across. That's just absolutely striking. I don't believe it. Ring sight. Yes.

No, I can't get to it now, Al. Buried. Too much junk. Hey, Al, use the - edge - the - the corner of the camera. Let me show you. Let me show you how to aim that thing so you hit. See this thing? See? Right along this edge here. Line that up. Just take all the parallax out and line that up, and it's a straight shot.

Hey, Jim, is the waste water stopped?

Yes, I turned the dump off.

You did?

Yes.

So did I. How could you have turned --

No. Oh, I'm sorry. The urine dump.

You - you're not lis --

Oh - Oh, okay. Waste water --

Yes. You're not paying attention to me again, Jim.

-- 25 percent.

Okay.

He closed it.

You're right. Yes.

You wanted me to confirm that it had been closed.

Yes, right.

I don't see a drop anymore.

...
03 08 39 02 CDR  Huh?
03 08 39 04 LMP  Can't see that ridge you were talking about, Dave.
03 08 39 06 CDR  You're going across it. Right where the terminator comes out. No, that's the horizon. Okay. I'm ... Yes.
03 08 39 30 LMP  Isn't that a good boy, Al?
03 08 41 16 CDR  Hey, Jim, here's this little vent.
03 08 41 19 LMP  Okay.
03 08 42 46 CDR  Yes.
03 08 43 06 CMP  Jim, I don't see ... .
03 08 43 44 CMP  I see. That's - Ingenuity over there on the -
03 08 43 58 CDR  Hey, Jim, what did you do with those tissues that were over here? Remember?
03 08 44 03 LMP  I didn't use any of them, Dave.
03 08 44 05 CDR  No, but - there wasn't any of those little --
03 08 44 08 LMP  Those medium ...?
03 08 44 29 CDR  What?
03 08 44 44 CDR  The very subdued rille that runs aro - perpendicular to the mountain? Oh, I see what you mean. Along the edge of the - Is that on the edge of ...? Of Ingenuity, huh?
03 08 45 22 CDR  I can keep you posted here about - You take - you take photos until about 49 here.
03 08 46 00 LMP  This must be Gagarin coming up.
03 08 46 05 CDR  Yes.
03 08 46 08 LMP  Think I have better luck holding the map backwards.
03 08 48 41 LMP  That's Gagarin we're over, huh?
Do you know what Keyhole looks like? Geez. That's the kind of thing that would be good to explore.

There's that neat one with the very white ejecta pattern - out at 1 o'clock.

Do you want to ... the window?

Yes.

I think we better get this - all the windows down.

Yes. I think we better leave. You know you don't have to get them all, Al. ... 

Oh, yes.

... might be AUTO.

Hey, Jim?

Yes.

You got your sunglasses?

Not quite, Al. Did you just pass me some sunglasses, Dave?

Yes.

Okay.

I think they're yours. Aren't they?

Yes.

You can see that - see the canyons on it?

Find Keyhole, Al? Good.

What's distinctive about Keyhole?

Oh, really?
I can sure see a lot - lot of blocks around this one coming up. A lot of blocks on the rim. And a slump on the - the west side of it.

Okay, the next one is target number 7, Al. It's The Bright One.

That's -

The one with slump blocks in the center of it?

The one we're just coming up on, huh?

Yes. That's it. Yes, that's Dooze [?]. Bright One. Yes, that's the one we want to get a - complete - We want two pictures of the ejecta pattern all the way along through there.

(Camera click)

Yes, there's King over there.

Hey, Jim?

Yes.

Hey, Jim, ... take care of that little map. That's the only one we got - you and I.

Yes, I understand.

Take good care of it.

No, we have another set - Well, the only one of the little ones. Yes, you're right. Don't ask for ..., huh?

By golly, old Bright Crater is a bright one, too. It's got good ray pattern. Glass all over.

(Camera click)

(Camera click)

(Camera click)
03 08 59 50 LMP Geesh.
03 08 59 52 (Camera click)
03 08 59 57 (Camera click)
03 09 00 11 (Camera click)
03 09 00 18 LMP O₂ FLOW HIGH.
03 09 00 37 (Camera click)
03 09 00 40 (Camera click)
03 09 02 00 CMP Okay, let's see. Let's try to get this Rooster Tail.
03 09 02 07 LMP The next target you have is Ibn Yunus.
03 09 02 10 CMP Yes, but I'm going to try and see if I can get a shot of the Rooster Tail here if I can.
03 09 02 20 CMP That won't go anywhere.
03 09 02 51 CDR ...
03 09 03 05 CMP You what, Jim?
03 09 03 07 LMP ... Ibn Yunus ought to be coming up on the left side here shortly.
03 09 03 12 CMP Yes. Should be.
03 09 03 15 LMP Oh, look at the Earth come up - earthrise. ... all day, we ought to look at that ...
03 09 03 20 CDR Oh, yes.
03 09 03 27 CMP ... you don't ...
03 09 03 29 CDR Yes.
03 09 03 32 LMP Golly.
03 09 03 33 CMP That ought to be good for a picture, huh?
03 09 03 35 CDR Oh, yes. Be better when you're ...
03 09 03 38 CMP Yes. I got part of the LM in the way there.
Let me see here - let me - Yell if you see the Rooster Tail.

I'm not sure what the Rooster Tail looks like, Al.

That's that little secluded - dome on a - on a ca - on a small crater that Farouk was showing us the other day.

Yes, I think there's one - -

That a - -

-- coming up here - that -

It should be quite obvious if you see it.

Well, there's kind of an occluded area to the west.

It looks - it looks very much like a rooster tail.

... 

Yes.

See the one coming up, Dave, ... in the occluded area - to the west?

Is that the one ...

Yes, I think it's very fresh.

Should it be right on track?

Yes. Right underneath.

... There's one underneath us. Big rille and ...

Could that be it - the one we're just coming up on, Al?

Yes. That's it. Must be it.

... a shot of it here.

Yes.

There's Babcock out there.
Hey, Al, can I do a VERB 64 in this P20 or will it kick it back out?

No. It'll keep it in.

Maybe I ought to get up there and do one ... 

Yes. It should. It should work.

... 

Fifteen and 12.

Fifteen and 12?

Uh-huh.

Okay. We were up to ...

... do that. ...

Getting hungry, Al?

Huh?

... seemed like the day was getting along.

We've only got 12 minutes to the burn.

Okay. ...

Okay, that's right. We're at 12 minutes.

...

Do you feel all right? You okay?

... spacecraft roll ...

Okay. ... it up to 10 degrees; ... to zero.

...

... 8.
03 10 29 02 LMP ... burn ...
03 10 29 03 CMP 159.
03 10 29 05 LMP ... junk.
03 10 29 13 CMP Yes. You're right. Why don't you ... These are yours.
03 10 29 33 LMP ... steady this ...
03 10 29 35 CDR No.
03 10 29 58 LMP How much time we got before the burn - 10 minutes?
03 10 30 01 CDR Ten minutes.
03 10 30 02 CMP Nine minutes.
03 10 30 04 CDR Okay. GDC's alined.
03 10 30 07 LMP Do you want to call P40? ...?
03 10 30 11 CDR Okay. P40.
03 10 30 22 LMP Okay. BMAG MODE, three, to RATE 2.
03 10 30 26 CDR RATE 2.
03 10 30 28 LMF SPACECRAFT CONTROL, CMC, in AUTO.
03 10 30 30 CDR CMC, AUTO.
03 10 30 31 LMF PRO.
03 10 30 34 CDR Okay, we'll wait a little here. Maybe we ... --
03 10 30 36 LMF You got roll aline?
03 10 30 37 CDR Yes. It's all alined. We're all ... --
03 10 30 38 LMF GDC and roll? Okay. TVC check and prep. Circuit breakers STAB CONTROL SYSTEM, all closed on panel 8.
03 10 30 43 CDR Okay. ... going in. Okay?
03 10 30 49 LMF CB SPS. Should be 11 closed.
03 10 30 53  CDR  Okay, 11 closed; MAIN A is out.
03 10 30 55  LMP  Okay.  You got DELTA-V<sub>C</sub> set.
03 10 30 58  CDR  DELTA-V<sub>C</sub> is set; 208.4.
03 10 31 01  LMP  EMS FUNCTION, DELTA-V.
03 10 31 03  CDR  DELTA-V.
03 10 31 05  LMP  MAN ATT, three, to RATE COMMAND.
03 10 31 06  CDR  RATE COMMAND.
03 10 31 07  LMP  DEAD BAND, MIN.
03 10 31 08  CDR  MIN.
03 10 31 09  LMP  RATE, LOW.
03 10 31 10  CDR  LOW.
03 10 31 11  LMP  TRANSLATION CONTROL POWER, on.
03 10 31 12  CDR  On.
03 10 31 13  LMP  SCS TVC, two, to RATE COMMAND.
03 10 31 15  CDR  SCS TVC to RATE COMMAND.
03 10 31 19  LMP  DELTA-V<sub>CG</sub> to LM/CSM.
03 10 31 20  CDR  LM/CSM.
03 10 31 21  LMP  TVC GIMBAL DRIVE, PITCH and YAW, to AUTO.
03 10 31 23  CDR  AUTO.
03 10 31 24  LMP  ...  Okay.  ...
03 10 31 28  CDR  (Laughter)  Going about it the hard way, maybe.
03 10 32 14  LMP  Did you ...?
03 10 32 16  CDR  Yes.
03 10 32 31  CMP  ...?
03 10 32 33 LMP Four jets and 15 seconds.
03 10 32 35 CDR Four jets, 15 seconds on the ullage. Okay.
03 10 32 43 CDR Coming up on 7 minutes.
03 10 32 50 CDR MARK; 7 minutes.
03 10 33 09 LMP ...
03 10 33 11 CDR Right. Well, we're not going to have any overburn.
03 10 33 25 CDR Okay, Jim. Coming up on 6 minutes.
03 10 33 27 LMP Okay.
03 10 33 28 CDR Start.
03 10 33 29 LMP MAIN BUS TIES coming on.
03 10 33 34 LMP TVC SERVO POWER 1, to AC 1/MAIN A; 2 to AC 2/MAIN B.
03 10 33 39 CDR 1 is AC 1/MAIN A and 2 is AC 2/MAIN B.
03 10 33 42 LMP ROT CONTROL POWER, NORMAL, two, to AC.
03 10 33 45 CDR ROT CONTROL POWER, two, NORMAL, AC.
03 10 33 47 LMP ROT CONTROL POWER DIRECT, two, OFF.
03 10 33 49 CDR DIRECT, two, OFF.
03 10 33 51 LMP BMAG MODE, three to ATT 1/RATE 2.
03 10 33 53 CDR BMAG MODE, three of them, to ATT 1/RATE 2.
03 10 33 56 LMP SPACECRAFT CONTROL, SCS.
03 10 33 57 CDR SCS.
03 10 33 59 LMP RHC number 2, armed.
03 10 34 01 CDR RHC number 2, armed.
03 10 34 03 LMP ... at 5.
03 10 34 06 CDR Okay.
Okay. Let’s go ahead.

Okay. GIMBALS MOTORS PITCH 1 and YAW 1, on.

Coming on.

1, 2.

Okay.

Verify trim control and set.

Okay. Verify the trim and set at 1.68 and minus .55. Verified.

Verify MTVC.

MTVC.

Verified.

SPACECRAFT CONTROL, CMC.

CMC.

THC, clockwise. And verify no MTVC.

Clockwise.

Getting roll out of that.

No MTVC.

Secondary TVC check. GIMBAL MOTORS PITCH 2 and YAW 2, on.

PITCH 2 and YAW 2 coming on.

2 - on. Set GPI trim.

Okay.

Verify MTVC.

Verified.

THC neutral. Verify no MTVC.
03 10 35 48  CDR  No MTVC.
03 10 35 49  LMP  Verify GPI returns to zero, zero.
03 10 35 52  CDR  Zero, zero.
03 10 35 53  LMP  ROT CONTROL POWER, NORMAL, two, to AC/DC.
03 10 35 57  CDR  AC/DC.
03 10 35 58  LMP  ROT CONTROL POWER, DIRECT, two, to MAIN A/MAIN B.
03 10 36 01  CDR  DIRECT, MAIN A/MAIN B.
03 10 36 02  LMP  BMAG MODE, three, to RATE 2.
03 10 36 04  CDR  BMAG MODE, three, to RATE 2.
03 10 36 06  LMP  PRO. ...
03 10 36 08  CDR  Okay. ...
03 10 36 18  LMP  Okay?
03 10 36 20  CDR  That's okay. Yes. Looks good.
03 10 36 22  LMP  Okay. Next --
03 10 36 23  CDR  Okay?
03 10 36 24  LMP  -- to BMAG MODE --
03 10 36 25  CDR  Ready?
03 10 36 26  LMP  -- three, to - ATT 1/RATE 2.
03 10 36 28  CDR  ATT 1/RATE 2. Okay?
03 10 36 34  LMP  Let's see, if I remember, the next line is ENTER. Yes. Yes, we're right there. ...
03 10 36 49  CDR  Yes.
03 10 36 53  LMP  Okay. FDAI SCALE, 5/5.
03 10 36 55  CDR  5/5.
03 10 36 56  LMP  RATE, HIGH.
03 10 36 57  CDR  RATE, HIGH.
03 10 36 59  LMP  Update the DET, if necessary.
03 10 37 04  CDR  ... we're right on it.
03 10 37 06  LMP  Okay. HELIUM VALVES are AUTO; N₂ A and B are good at 2500. Okay, ... are minus 2 - you get DELTA-V THRUST B to NORMAL.
03 10 37 23  CDR  Roger.
03 10 37 31  CDR  Let's get this ... here.
03 10 37 41  CMP  ... probably ... and follow if you can -
03 10 37 44  LMP  Right. Hey, let me do the -
03 10 37 49  CDR  Okay; 2 minutes.
03 10 37 51  LMP  Okay. DELTA-V THRUST B to NORMAL.
03 10 37 52  CDR  DELTA-V THRUST B to NORMAL.
03 10 37 56  LMP  THC, armed.
03 10 37 58  CDR  THC, armed.
03 10 38 00  LMP  RHC, both armed.
03 10 38 02  CDR  Both armed.
03 10 38 20  LMP  Stand by for minus 35.
03 10 38 24  CDR  Okay, that's 35 to go.
03 10 39 09  CDR  Okay, it looks like we're coming up to average g.
03 10 39 11  LMP  Yes.
03 10 39 13  CDR  (Cleared throat).
03 10 39 16  LMP  Average g is on.
03 10 39 19  CDR  Okay, standing by for a 15-second ...
03 10 39 22  LMP  EMS MODE, NORMAL.
03 10 39 23 CDR NORMAL.
03 10 39 35 MS Ullage.
03 10 39 40 CDR Okay. GO for the burn?
03 10 39 41 CMP You're GO.
03 10 39 46 CDR Ready for the PRO.
03 10 39 50 CMP B valves.
03 10 39 51 CDR B valves.
03 10 39 52 LMP Okay. The clock is running.
03 10 39 56 CMP Oh, she goes.
03 10 39 59 CDR Okay.
03 10 40 05 LMP 10, 9, 8, 7, 6, 5, 4, 3, 2, 1 -
03 10 40 14 CMP Zero; THRUST off; automatic. Gimbal motors.
03 10 40 21 LMP Stand by, Al. 1, 2, 3, 4.
03 10 40 30 CMP You don't trim?
03 10 40 31 CDR Uh-huh.
03 10 40 32 CMP CDR took us to within 1? Good. Now TVC - -
03 10 40 36 LMP TVC SERVO POWER 1 and 2, OFF.
03 10 40 39 CMP OFF.
03 10 40 40 LMP MAIN BUS TIES coming OFF.
03 10 40 41 CMP Roger.
03 10 40 48 CMP ... burns to within 1 foot per second.
03 10 40 51 CDR Okay.
03 10 40 52 LMP Pressure's down.
03 10 40 53 CMP Pressure's still coming ... down.
03 10 40 57 LMP ... 
03 10 41 02 CMP Okay, Jim.
03 10 41 03 LMP Okay, you got everything?
03 10 41 05 CMP Let's clean them up.
03 10 41 06 LMP Okay, EMS FUNCTION's off.
03 10 41 07 CMP Off.
03 10 41 08 LMP EMS MODE, STANDBY.
03 10 41 09 CMP STANDBY.
03 10 41 10 LMP RHC and THC locked.
03 10 41 11 CMP Locked.
03 10 41 12 LMP DEAD BAND, MAX.
03 10 41 13 CMP MAX.
03 10 41 14 LMP TRANSLATION CONTROL POWER, OFF.
03 10 41 15 CMP OFF.
03 10 41 16 LMP ROT CONTROL POWER, DIRECT, OFF.
03 10 41 18 CMP Two - that's two OFF.
03 10 41 20 LMP BMAG MODE, three, to RATE 2.
03 10 41 21 CMP RATE 2.
03 10 41 22 LMP CB, DIRECT ULLAGE, two, open.
03 10 41 24 CMP DIRECT ULLAGE, open.
03 10 41 26 LMP CB, SPS PITCH 1 and YAW 1, open.
03 10 41 29 CMP PITCH 1, YAW 1, open.
03 10 41 30 LMP PCM BIT RATE going LOW.
03 10 41 32 CMP A and B also open.
... by 10 miles.

Let's see ... That's got to be Tsiolkovsky.

... overburned just a little bit, but the little ... was 10 seconds short.

... second burst, and we overburned just a bit.

Okay, I'm going to go down and ... up the SIM bay here.

Look at this ...

See where it says 2.5 ... 25 ...

Okay, let's see what it says here.

Okay.

You know what the ..., don't you? ...

What?

... seconds to go. Probably ... and ... 10 seconds.

That's right. We did ... over.

Yes. We did - especially when ... getting ...

... I could - I could tell ... - not ... on.

Yes.

I thought about that, you know?

Yes. Yes.

It was just right after ...

I could - I could see your hand start to go. And I looked at the DSKY and looked up, and then I could see it was going to shut off. But I could see your hand - you were - you were waiting for it. I knew I wasn't going to be more than half a second after.

Yes. That - that's pretty close.
03 10 43 36 CDR  Yes.
03 10 43 37 CMP  But you could see it - I could see when (cleared throat) when it automatically shut down before I could ...
03 10 43 44 CDR  Oh, yes.
03 10 43 46 CMP  Well, you know the ball valve actually opened up ... like that ... And I usually --
03 10 43 52 CDR  Yes.
03 10 43 53 CMP  -- can't see that. I started to watch the ...
   \[P_c\] started ...
03 10 44 00 CDR  ... shut down ...
03 10 44 03 CMP  ... I know what you mean --
03 10 44 04 CDR  ...
03 10 44 05 CMP  Yes, I know. I keep telling them it's going to be ...
03 10 44 12 CDR  Oh yes. Right ... nothing like a ..., wouldn't you say?
03 10 44 23 CMP  Yes. Okay. ... VERB ... get it in ...
03 10 44 26 CDR  All right. What do you want to do?
03 10 44 29 CMP  ... a ... ...
03 10 44 38 CDR  Yes. Yes. ...
03 10 44 54 CMP  ...
03 10 44 56 CDR  Yes. Oh, here comes ... That terminator is just like something out of the movies.
03 10 45 11 CMP  Yes. ... --
03 10 45 12 CDR  I mean it's just a - just a strip all the way across.
03 10 45 15 LMP  Yes, boy.
03 10 45 18 CDR  Hold your breath on this one, Jim?
03 10 45 21  LMP  What in the hell would you ...?
03 10 45 25  CDR  Yes. Yes, but I wouldn't say it ...
03 10 45 34  LMP  Oh, ... ...
03 10 45 38  CDR  Huh?
03 10 45 39  LMP  Do you know what we have to do yet?
03 10 45 41  CDR  Yes. ...
03 10 45 45  LMP  Gee. This is ... We're not even down in the ...
03 10 45 49  CDR  (Laughter)
03 10 45 51  LMP  Wait until we get down in the ..., then we're ...
03 10 45 54  CDR  240,000 miles and ... (laughter).
03 10 45 57  CMP  What do you want?
03 10 45 58  CDR  (Laughter)
03 10 45 59  LMP  ... you know, but ... --
03 10 46 00  CMP  You want me to put you on the surface?
03 10 46 02  CDR  (Laughter)
03 10 46 03  LMP  ... --
03 10 46 04  CDR  Why don't you, Al? (Laughter)
03 10 46 05  LMP  -- ...
03 10 46 06  CDR  That's true (laughter).
03 10 46 08  LMP  ...?
03 10 46 09  CDR  Yes, that's right (laughter).
03 10 46 11  LMP  ... --
03 10 46 12  CDR  No. I want to be safe (laughter).
03 10 46 13  LMP  ...
03 10 46 16  CDR       Yes, you're right, boy, you're right. 
03 10 46 24  SC        (Yawn)                 
03 10 46 26  CDR       ...?
03 10 46 28  LMP       That's right.
03 10 46 29  CDR       Go on to sleep, Al.
03 10 46 30  LMP       ...
03 10 46 31  CDR       ... I think you're about ready for bed.
03 10 46 55  CMP       ... P52.
03 10 46 57  CDR       No.
03 10 46 58  LMP       Yes. ...
03 10 47 00  CMP       ...                          
03 10 47 01  LMP       Let's see if we can't help Al a little bit.
03 10 47 03  CDR       Sure. Let's ...              
03 10 47 06  CMP       No. ...
03 10 47 10  CDR       If you're going to be operating this ... for  
                        3 days, we ought to try and set up a system to 
                        square it away.
03 10 47 13  CMP       ...                          
03 10 47 15  LMP       Yes. ...
03 10 47 16  CMP       ...                          
03 10 47 17  LMP       ...                          
03 10 47 22  CMP       ..., ..., and tomorrow night ..., except most 
                        of those pictures would be in the open. ... 
                        pictures of the lunar surface. I think it'll 
                        probably ... a couple of days ...
03 10 47 37  CDR       I think so, too.
03 10 47 38  CMP       ... situation..., fill it up, and ...
03 10 47 48 CDR Yes.
03 10 47 49 CMP You really need to do that. You can't just ...
03 10 47 58 LMP If you're at all worried about the Flight Plan, ...
03 10 48 05 CMP Hey, that looks black. Wouldn't you say that's black?
03 10 48 09 CDR I'd say it's a dark gray.
03 10 48 11 LMP There's something up here that's dark gray?
03 10 48 13 CDR Well, this looks like it's ...
03 10 48 20 LMP Man, it already looks like we're lower. Whoo.
03 10 48 25 CMP ... looks black over there.
03 10 48 29 CDR Hey, that's right. It looks real dark way down there.
03 10 48 33 CMP ...
03 10 48 35 LMP They say then it looks like you're just going to dive.
03 10 48 38 CDR It sure does.
03 10 48 39 LMP ... going at 50 feet per second.
03 10 48 41 CDR Yes, siree-bob. Hey, look at that big mound over here, son of a gun. Hey, hey, check the mound ...
03 10 48 51 LMP Oh, yes?
03 10 48 53 CMP That's Van De Graaff.
03 10 48 54 LMP That's bigger than Van De Graaff.
03 10 48 55 CDR The one right under us?
03 10 48 56 CMP No, the one just out there at 11 o'clock.
03 10 48 58 CDR Oh, yes.
The long - elongate one. That's Van De Graaff. And just out in the distance there, off to the left is - is the Mare Ingen-u-ity.

Oh, yes. ... to the left?

(Yawn)

That's ... It's just as ...

... mountain's ..., and the ... mountain's ...

Whoo-ho-ho! Oh, ho, no. (Laughter).

He's already ... Hey, what do we - what do we have to do?

Hold on a minute.

...?

Roger. We already look low, and we got 180 degrees to go, babe.

What time do we ...?

Another 25 minutes.

Holy cow.

Hey, you can ... It's a great place to take a bunch of pictures of the - of the ... and all that. We ought to do that ...

Look at that ... down there, underneath us. About ... ... there.

...

Well, old buddy, I guess that's all very ...

Yes.

Is this ... rille that - or is this a rille?

What?

This ... flat piece we're coming up on.
Hey, no, that's that rille I was talking about before.
Yes, Al.
Yes. This one ... here. ... first time ...? Where is that crater?
We ought to get a picture of that ...
... reading?
... 08. It's close to Kepler.
It almost looks like it's a ... feature rather than a rille.
The one we're going over right now?
Yes.
Yes. Who's got the 80? Is it CMP?
I'm looking.
See out here at 10 o'clock, Dave?
Yes. I do.
That's the one we picked up on the map, we called ...
The rille?
Yes, because it just kind of - slopes on the inside; looks like most of the ... turns up even though there isn't any rille.
Okay, Al. Here's the - the 80.
I don't ... --
You'll get a much better picture from this attitude.
Is that right?
Just like a low-level flight.

... this is really ...

We must be ... here.

Oh, what's the ...? How much time we got before ...?

... showing 63 and 1 ...

... use the 250 or do you want to go to --

Let me get - let me get one here with the 250. ...

..., Dave?

...

Yes, sir! ...

That was a ... continuous ...

... low.

...

You know, we are going ...

Look at that.

...

It's really ...

...

...

...

...

Yes.

Wouldn't that be something? ... right over there ...

...
03 10 54 05 CDR Did you ever check those photo things for me, Jim?
03 10 54 07 LMP Yes. ...?
03 10 54 09 CDR Quite sure. Yes. There should be two that were like that.
03 10 54 15 LMP Just a minute here.
03 10 54 22 LMP Well, you're looking for ...
03 10 54 27 CDR Sea of Ingenuity?
03 10 54 29 LMP Yes; 5.6 at a 250th.
03 10 54 31 CDR Okay.
03 10 54 32 LMP And then at Keyhole, you look ... And The Bright One, you look to the left.
03 10 54 59 CDR You know, I think this is ... down here. Look at ... - -
03 10 55 00 CMP ...
03 10 55 02 CDR - - ... We'll get a couple of pictures here.
03 10 55 10 CDR ... though.
03 10 55 30 CDR You got a roll in there?
03 10 55 31 CMP Yes. P ...
03 10 55 33 CDR ...
03 10 56 07 CDR You might say some of those craters are really ...
03 10 56 11 CMP ... navigation is a little more difficult down at this altitude.
03 10 56 14 CDR Huh?
03 10 56 15 CMP Navigation is more difficult at this altitude.
03 10 56 17 CDR ... 
03 10 56 20 CMP Low-level navigation.
03 10 56 21 CDR Oh, I don't know.
03 10 56 24 CMP Did you get yourself located?
03 10 56 27 CDR ... pretty well - set.
03 10 56 36 CDR ...
03 10 56 39 LMP At least you can follow them, now that we're going forward.
03 10 56 44 CMP You should be coming upon Gagarin ...
03 10 56 53 CDR There's sure a good-sized one off to the north.
03 10 56 58 LMP Well, Gagarin is very shallow, oval.
03 10 57 03 CDR See that? Off to the north?
03 10 58 15 CDR Have you see it yet? Jim apparently has the right idea.
03 10 58 24 LMP Yes.
03 10 58 25 CMP ...
03 10 58 42 CDR Well, it's in the right attitude. Can you see anything over there, Jim?
03 10 58 45 LMP Yes. ... all right.
03 10 58 50 CMP It looks that way, but it sure is ...
03 10 58 52 CDR Watch the TV.
03 10 59 13 CDR Look for the ... one over on the left side.
03 10 59 15 CMP Yes.
03 10 59 16 CDR Should come over the horizon.
03 10 59 18 LMP ...
03 10 59 20 CDR ...
03 10 59 22 LMP No, I ...

CONFIDENTIAL
Yes. That is the central peak of Tsiolkovsky, I bet you 10 dollars.

Really?

Yes.

And that is --

... --

-- sort of a big...

... in the rim.

...?

Huh?

No.

Think there's ... in the ...

Well, there's - Yes, there's parts of it that are very small, such as the peak.

But I guess it doesn't really strike home until you get down to something like this ...

Good idea. I'll ...

Oh, boy. I'll never sleep ... open.

No, that's a pretty good theory, though.

Yes, I want to - I want to wade through ... - go through this.

...

Yes. Yes, ...

Okay. We got two developing ... over there.

God damn, that's just like being on a poor bus!
(Laughter)...

Hard enough?

Dark?

Yes.

Up on the ridge line.

I think that's shadows, isn't it?

I don't think that's shadow...

... good idea...

Yes.

Oops, over here...

What the hell is it?

Two old compasses.

Oh, good grief...

Oh, man. That sure is a great landmark.

Isn't it?

... supposed to do that, you know where we are.

Yes. Boy, you sure got a good attitude, Dave. It...

Isn't it beautiful!

No, I couldn't - I couldn't have picked a better one myself.

I'm trying here to figure out where those two...

They should be -

... - Look at that - that one right there. Right there.
... Whoa.
Now look out.
Oh, yes. Hey, yes. That's Mount ...
Yes, yes.
... Say, you can really see, can't you?
Light's on.
Why don't you take you some pictures?
Okay.
Let's see, we're right at ... No, let's see. ...
We're heading just a little bit to the ri - to the left of our Flight Plan.
What?
And maybe a few deg - around the curve, there.
Curve?
Yes, don't you --
You want to show me it?
Yes. My pleasure. Look. There it is. Look.
Maybe you should ... on the end there.
Oh, nothing.
... Everyone says ... that you're not allowed to do it, but you have to do it if ...
Does it look like anything?
Yes.
...
Move the fans over.

Will the ...?

Yes.

Okay.

Hey, you guys really ...

Yes.

That's when you ... You can feel it.

Yes.

... (coughing) ...

What?

... that long.

You going to be able to look at it through your sextant? Did you -

I'm not sure.

...

...

Yes, do you mean we got to go up through the ...?

If you're not going to make it?

No, I - I figured you'd rather do it.

No, it's up to you. You do whatever you'd like.

No. Oh, no, I'm not going ... --

Okay, very good.

-- ...

That's right.
... you got to give a ... that you'll get over it. You - you do everything you want to do.

You do everything you want to do.

(Laughter)

I - If I'm in your way, just ... it down.

Oh, sure.

(Laughter)

You're too hard for him. You be easy on him, or he'll ... - -

Oh, yes. Very good.

Where is ..., by the way?

It's out in the middle of ...

Is it really?

Yes.

The same crater as we were ...?

Yes.

The same patterns as ... Crater?

As a matter of fact, I could have gone through ...

Why don't you do that?

Okay.

That'd give us an idea of ... ... what you're going to be looking at. ... - you know you ...

Well, I tell you, it's not a very - it's not a very colorful crater.

..., Jim. Did you see ... over there?
03 11 07 45  LMP  Yes.
03 11 07 47  CMP  It's sure going to be ... stick to the time line.  
Yes, that would.
03 11 07 54  LMP  One-half hour.
03 11 07 56  CDR  ...
03 11 07 58  CMP  Hey, you ...
03 11 08 05  LMP  You got a ... space.
03 11 08 09  CMP  Yes, can't even see the horizon.
03 11 08 13  CDR  Yes.
03 11 08 14  CMP  ... in the ORB rate.  ... get back to the ...
03 11 08 32  CDR  ... VERB 67.
03 11 09 50  CDR  ... we can get to this ... The - Can you move 
that thing?
03 11 09 58  CMP  Yes.
03 11 09 59  CDR  You really don't need ...
03 11 10 00  CMP  Yes.
03 11 10 01  CDR  Isn't that the truth?  You really don't need it.
03 11 10 22  CDR  There it is.
03 11 10 28  CMP  ...
03 11 10 37  CDR  Wait a minute.  ...
03 11 10 43  CMP  Yes, well, even that ... That's why we had trouble 
finding anything at all that we could use, because 
there isn't anything.
03 11 10 49  CDR  Nothing to change it over here at all.  Nothing 
to change it, Al, ... that we could use.
03 11 10 55  CMP  How about a - Let's see, what kind of ... we use. 
25.958?
Uh-huh. And we've got ...
Yes, and you got ... Five point ... here. ...

Huh?
...
...
...
...
...
Yes.
There'd be a lot more.
Yes.
...
...
...
...
...
Got that.
I get that initial downhill impression. We're supposed to be ...
...
...

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Darn it. Right there.

There it was, whatever it was.

Hum. ...

Yes.

Good. ...

Did you get this ... on, Jim?

Yes, but I never could tell ..., when it went on.

Did you get this ... on, Jim?

Okay.

Okay. LASER ALTIMETER, ON.

Yes.

MARK.

Okay, let me talk to Karl here for a minute. Houston, 15.

Okay, Karl. I got a few numbers for you on the extension time. We started the whole thing off at 84:06:30 and got the covers open, the mapping camera extended, and the extension was about 3 minutes instead of 4. And we deployed the gamma ray and the mass spec booms for a barber pole plus 2 seconds. The gamma ray - turned barber pole after 6 seconds, and the mass spec turned barber pole immediately. And I was suspicious of the mass spec, so we tried it again and got the same results. Turned the X-ray on at 84:15:10 and the laser altimeter on at 84:15:30.

Looks like that stuff's working fine. Tch, tch.

Great! Super!

Good enough.
That's it. Verify DSE tape motion at 84:20, and then we get the cameras ready for terminator photos.

That a boy!

Pan camera, we go - we already got our terminator photos. Did you get - Let's see, we want MAG R. That's this MAG here.

With the Hasselblad? You got the Hasselblad over there?

Yes. And, let's see, we want the Hasselblad 80 millimeter, intervalometer - -

Let's see, intervalometer's down there, Jim, in the - Let's see - It's in the camera - It's right in front of the camera compartment.

Oh, boy.

It's right there; that's it.

Okay. What do you want to do now, get the Hasselblad?

Jim, you're all right.

Well, the way to do that is just to play it straight from now on.

... I need somebody to take care of me.

...

Yes.

... an earful of that. 15, Roger. That's verified. Is that right, Dave?

Yes.

If ... orders, I can get it.

Okay.

Man, that's really good and stuck!
... all right.
Pork and scalloped potatoes!
You'll have what?
I'm going to order pork and scalloped potatoes; I don't whether you do or not, but I am.
Okay, f = 2.8, 1/250th, and infinity. Take six frames. Okay. Right out of this window here. And we're going to get the pan camera going in there, too.
... That's frame number - 14.
... That's right (laughter).
We both like to hear that (laughter).
Now, I'm going to show you how I'm going to handle this stuff here. Well, it looks like we just lost them. (Cleared throat).
That won't be the same from now on.
It won't?
No. Minus 5 and 25.
...?
Yes. Because we're in SIM bay attitude now.
... A and B.
That's the stowed position only. It - it's minus 5 and 25 for REACQ when we come around the other side.
Okay. ...?
Yes.
OB 12 21 45 LMP I'll tell you, this Moon flying could be fun.

OB 12 21 48 CMP This what?

OB 12 21 49 LMP I said, "This Moon flying could be fun."

OB 12 21 50 CMP Yes, yes, yes, yes.

OB 12 21 53 CDR Hey, listen, Al, we got to get the pan camera going here, right?

OB 12 21 57 CMP Okay, T-start is the (cleared throat) --

OB 12 22 01 CDR ...

OB 12 22 03 CMP Yes. T - T-start is the big time, and everything's hinged around T-start, so I take that time and punch it into P30 (cleared throat). And just load NOUN 33 to that time.

OB 12 22 19 CDR ...

OB 12 22 23 CMP We're gaining 4 - plus 42 23, I guess.

OB 12 22 40 CMP Yes, I'm going to do it like that on all of them. Now, when you come up on a thing like that, EL says T-start minus 1:40 --

OB 12 22 57 CDR Yes.

OB 12 22 58 CMP Well, it's right on the DSKY there.

OB 12 23 00 CDR ...

OB 12 23 02 CMP And the MAPPING CAMERA, IMAGE MOTION, ON. Talkback barber pole 3 to 5 seconds, then gray. That can be done anytime; that's not important. EL OFF at T-start; MAPPING CAMERA, ON, at T-start; PAN CAMERA, OPERATE, at T-start. Jesus, they got all kinds of things going on here at T-start. MOTION INCREASE - talkback barber pole plus 2 steps. I better do that mapping-camera thing.

OB 12 23 26 LMP ...

OB 12 23 34 CMP You got 18 minutes ... - If you'll take the EL, and all you got to do is - point the - point the
Hasselblad straight down and start the intervalometer going, and start it at at minus 1:40 on the clock and stop it as zero.

03 12 23 48 LMP All right.

03 12 23 52 CMP And it would be much appreciated.

03 12 23 56 LMP ...

03 12 23 57 CMP Okay.

03 12 24 04 CDR Jim, is my spoon up there somewhere? Spoon. Yes, it should be back in there.

03 12 24 18 LMP ...

03 12 24 22 CDR Find it anywhere?

03 12 24 38 CMP (Laughter) No, I'm not. I just didn't want to get in your way, believe it or not.

03 12 24 57 CMP Ah, let's see; yes, we're ready to go over here; 84:24; at about 84:33, we better do all that business. In the meantime, grab a bite. What are we having?

03 12 25 14 CDR Pork and scalloped potatoes.

03 12 25 15 LMP It's not bad.

03 12 25 16 CDR You know, I don't know why it is, every night at this time, my nose gets stuffy.

03 12 25 18 LMP Mine does, too.

03 12 25 20 CDR Every night, my - my nose starts getting stuffy along about this time, and then it cleans up after a bit.

03 12 25 25 LMP ...

03 12 25 27 CDR Yes, give me another squirt of hot juice there - when you get a chance.

03 12 25 38 CDR Hey, Jim, you know what I do tomorrow?

03 12 25 41 LMP Can't guess.
Day 4

03 12 25 42 CDR  Let's go shoot a landing. I'm ready. I'm ready to put that baby right in there, right now. I haven't had a TV flight in months.

03 12 25 59 CMP  Yes, sir, you better. You'll lose you ...  

03 12 26 02 LMP  That's right.

03 12 26 56 CMP  Oooh, that one's stretched. Pork and scalloped potatoes!

03 12 27 02 CDR  Sounds good.

03 12 27 03 CMP  Just like down home.

03 12 27 06 CDR  Mm-hmm.

03 12 27 25 LMP  ...

03 12 27 30 CDR  (Laughter) Yes, you - you know, it really works - works just fine if you - if you pop it and just keep pulling.

03 12 27 43 CDR  Hey, Jim?

03 12 27 47 LMP  ... water here ...

03 12 28 30 LMP  ... I think, the first thing I'm going to do when we get back?

03 12 28 34 CDR  What's that?

03 12 28 35 LMP  Have a beautiful night in Tahiti.

03 12 28 37 CMP  Hey, you're on, buddy. You're on - you're on! ...

03 12 28 41 LMP  No, really. You ought to really think about it.

03 12 28 44 CDR  Me, too. Big airliner.

03 12 28 47 LMP  Without the aviation.

03 12 28 49 CDR  Hey, you know what they tell you when you get to the ...?

03 12 28 50 CMP  No.

03 12 28 51 CDR  ...
03 12 28 53 LMP Is that right?
03 12 28 54 CDR ... They got up a special menu; it has everything that you want on it. You can eat steak and eggs ...
03 12 29 05 LMP Is that right?
03 12 29 06 CDR ... steak and eggs, or scrambled. ...
03 12 29 12 CMP You don't ... scrambled eggs, do you, Jim?
03 12 29 15 LMP Yes.
03 12 29 16 CMP ...
03 12 29 18 CDR Huh.
03 12 29 19 CMP ...
03 12 29 22 LMP All right.
03 12 29 23 CMP ...
03 12 29 24 LMP (Laughter)
03 12 29 27 CMP ..., Dave.
03 12 29 28 LMP (Laughter)
03 12 29 30 CDR You've been away too long, Jim!
03 12 29 32 LMP (Laughter)
03 12 29 35 CDR Golly.
03 12 29 38 CMP Yes. ...
03 12 29 58 CDR Is that all we get to eat?
03 12 30 01 LMP Yes, I think so. ...
03 12 30 08 CMP We ought to be about through with that food locker.
03 12 30 38 CDR ... pictures. Do we just take them from straight down?
03 12 30 42 CMP ...
03 12 30 54 CMP ... you want to ... You - you got that ...?
Okay, there's REV 3 ...

Take it out of window 4.

These will be the LM. You got all of them?

Yes.

And right at - the start of the ... You want to start looking out the window, window 4. ...

... ...

And then you want to ... off ...

That's right. Switch them back in stereo now?

Yes. ...

... now. ...

You know, that feels funny to look down.

Yes, ...

... ...

What's wrong, Jim. ... doing the dishes?

... ...

... ...

... ...

... ...

I got mine right over to here.

Yes, I have them.

Okay. ...

Ah, man. ...

Looks to me like we're roll.

We're roll.
03 12 39 19  LMP  Yes.
03 12 39 22  CDR  Is - is this picture supposed to be an oblique?
03 12 39 28  CMP  It's not a - a vertical picture.
03 12 39 30  CDR  It's an oblique picture, really.
03 12 39 36  CMP  Minus 1:40?
03 12 39 41  CDR  Okay. ... 
03 12 39 47  CMP  Straight down?
03 12 40 50  CMP  No, you're ...
03 12 41 03  CMP  Pretty dark.
03 12 41 25  CDR  Yes. Okay. I see where we are. Okay. ...
03 12 41 30  CMP  Yes.
03 12 41 34  CDR  Yes, but I - I seem to have it located myself here.
03 12 41 37  CMP  Oh.
03 12 41 38  CDR  I don't ..., but it's dark in here.
03 12 41 51  CMP  Nassau Bay was in the dark, I'm sorry to say.
03 12 41 55  CDR  Yes.
03 12 42 05  CMP  ...
03 12 42 43  CDR  I want to take one more for good measure --
03 12 42 46  CMP  All right.
03 12 42 47  CDR  -- but now it's getting in an area where you're getting something.
03 12 43 02  CDR  Okay.
03 12 44 11  CMP  Okay, let me turn this over here on the - Let me put this back under here - the bracket; it's a good place for it to be.
03 12 44 38  CDR  Okay. ...
03 12 44 40  LMP  Your next ... - is -
03 12 44 56  CDR  ... 228.
03 12 45 58  CMP  But that's a - that's a good place for it.
03 12 45 03  CDR  Yes. Good idea. Run them back in here.
03 12 45 11  CDR  Really?
03 12 45 14  LMP  Yes.
03 12 45 20  CMP  Oh, ... ... I'm starving.
03 12 45 29  CDR  Okay.
03 12 46 08  CDR  Give me a lunch pack, and I'll eat it.
03 12 46 10  CMP  Meatballs and sauce.
03 12 46 37  CDR  ... Need any help?
03 12 46 46  CMP  Do what?
03 12 46 53  CDR  Oh, isn't that sweet?
03 12 47 28  CDR  You want me to move? You want to get over here?
03 12 47 47  LMP  ... 
03 12 47 49  CMP  Meatballs and sauce.
03 12 47 51  LMP  Give me a spoon ... You got something for those?
03 12 47 59  CDR  No wonder you never lose it.
03 12 48 01  LMP  ...
03 12 48 24  CDR  One thing you're going to learn how to do is fly upside down.
03 12 48 26  LMP  (Laughter)
03 12 48 45  CDR  Yes. Yes. You'll be able to fly right-side up.
03 12 49 12  LMP  ...
03 12 49 21  CMP  Now I can see a bunch of ...

03 12 49 25  LMP  What ...?

03 12 49 27  CMP  ... Put it on the ...

03 12 49 49  CDR  Okay. Let me go to the movie.

03 12 49 58  CMP  No, by golly, there are lineaments down there all over the place, going - Well, northeast - Yes, northeast, southwest. See it? Right up on the ridge. Right along all the ..., by golly. Look at that.

03 12 50 16  CDR  Look out the window, Al.

03 12 50 18  CMP  What's over there?

03 12 50 19  CDR  What? Right here. Look out the center window, right down this way. We'll be parking right over - right over the grid.

03 12 50 30  CMP  You mean right over the - the ridge here? Right along the lunar ...

03 12 51 13  CDR  As long as you ... having a - the ground track that changes every rev, you're never going to get tired of looking at new things. You know, you'll have something new to look at the whole way.

03 12 51 41  CDR  That looks dangerous.

03 12 51 42  LMP  (Laughter)

03 12 51 43  CDR  You know, I about had meatballs all over the place.

03 12 52 02  CDR  What are you waiting for 2 minutes from now?

03 12 54 12  LMP  ...

03 12 54 59  CMP  Yes. I'll ... a couple ...

03 12 55 04  LMP  ...

03 12 55 10  CMP  I didn't mean to.

03 12 55 24  CMP  One minute to go.
You want me to get the mass spec and do what?
No, the boom out.
Oh.
Well, I was just thinking about that. I think what we need to do - is - You might take a little bath ... By golly, let's go do some around the Moon ...
One.
Huh?
... putting them on.
I figure we're far enough ahead - now. You can stop it - if you want to, you know, to live it up. Really live it up. Get clean, fresh -
... a tree stump ...
Yes.
It's got a big ... on the side.
... Check The Bright One? Boy, look at the junk coming out of it.
See this one wall here - how it's completely collapsed, straight down, and a bunch - bunch of little benches go down even farther - towards the bottom.
03 13 00 23 CMP The way that one ...

03 13 00 25 CDR Which direction?

TIME SKIP

03 22 05 20 LMP Your candy, Dave, is in that bag over there. Your breakfast is right here.

03 22 05 25 CDR Thank you. You're a good guy.

03 22 05 27 LMP Well, looks - looks like it's about the best way to do it here.

03 22 05 57 CDR No, 33.

03 22 05 59 LMP Is it actually a what, plus or minus --

03 22 06 00 CDR What?

03 22 06 01 LMP -- 9?

03 22 06 02 CDR Yes.

03 22 06 05 LMP Yes; 33's not so bad, except a -

03 22 06 08 CDR Plus or minus 9; that's a 24.

03 22 06 12 LMP ...

03 22 06 19 CDR I don't know whether we can or not. Let me ...

03 22 06 29 LMP Put a - put a 50-degree mark on the window.

03 22 07 58 CDR Yes. I know it, I want to get ahead. We got - got time to do it now. I just like to get everything done we can, and I'd like to be sitting and waiting.

03 22 09 47 CMP We should have turned that cabin fan off last night. It wouldn't have been so cool - been less noisy.

03 22 09 58 CDR Well, I tell you, I woke up at one time - and I listened to the noise, and I thought the thing was off. I thought to myself, "Great, somebody got up and turned the cabin fan off."
I was burning up down there. I just about got up and got the hoses - ... them down there.

Boy, you should have done that before you went to bed. Get yourself some air.

Yes.

Did you get any sleep, Jim?

Yes, about like the first night.

Well, you should have got up and got the hoses then. You need your sleep, babe.

Yes.

Huh! We're moving it. I can't believe it!

The ...! That biomed is working.

Al has them.

Oh, thanks. Son of a gun.

Well, I reckon what we ought to do is the burn, and then get suited. Burn and then get suited, you know - finish up the burn. You can put on your suit; get it out of the way. Go clear out the tunnel.

Yes. It really is.

I couldn't tell whether the spacecraft was moving or whether Dave was shifting in his couch.

Yes, we must have used a fair amount.

Need some more? I can get it for you.

... any more ...

You ready?

Yes. Don't push, just let it go, Jim. Pull it out and let it - and release it. Pull the handle out.

Again?
Just pull out - now let go. That a boy. You don't - you don't push it in. Have you been pushing it in?

Sometimes it sticks.

No, it never - no, it - it - you - it counts up and - it has a little accumulator in there.

Here.

Now, just pull it out and - and let it - and leave it go.

Okay.

The accumulator builds up, and then it'll shoot you. That's where you get your measurement.

Take a shot of cold right here.

All right.

... than caught short.

Ready?

Yes.

... 

... hot chocolate I just grabbed?

Yes, sure.

... 

... this good stuff is for the kid's stamina.

That all right?

The opposite end.

There. Eat it.

Al, I'll leave some bacon squares for you.
... remembered.

100 hours and 13 minutes, I think we ...

Hmm.

You like bacon squares? I'll leave you some, too.

Too much salt. Too dry and salty for a whole meal. I don't ...

Ten minutes until AOS. Huh!

You going to get this pad on the next rev?

Mm-hmm.

Al, why don't you and I switch off here when ...

I'd like to take a crap if I can work it in, Dave.

Okay.

Tell me when.

TIME SKIP

Al, can you get those?

What?

LOGIC POWER, two, to DEPLOY/RETRACT.

Yes.

I can't get in there among all the helmets.

DEPLOY/RETRACT.

You got another 15 degrees to go, Al.

Okay.

Jim, could you - -
03 23 39 35 LMP Yes.
03 23 39 36 CDR -- go ahead and finish what you're doing; I'm sorry.
03 23 40 01 LMP Al, you've got to change those LOGIC POWERs, too, and go back on OFF; I'm sorry. I was thinking we had to retract the booms. They're already retracted.
03 23 40 13 CMP Okay. I'll be glad when I get rid of you guys. I won't have to worry about those switches anymore.
03 23 40 18 CDR You won't, huh?
03 23 40 19 CMP Huh-uh.
03 23 40 20 CDR Oh, that's right. You don't have any maneuvers.
03 23 40 22 CMP No, I - I laid it on them. I said, "Those switches, as long as I'm by myself, are going to stay in DEPLOY/RETRACT all the time."
03 23 40 30 CDR That's good. Okay, you're almost there.
03 23 40 32 CMP Okay.
03 23 40 36 CDR And I'll tell you what. Why don't you do your P52, and just stay down there, and I'll do a P30 --
03 23 40 42 CMP All right --
03 23 40 43 CDR -- since we're at the attitude --
03 23 40 44 CMP Yes.
03 23 40 45 CDR -- and let you do the star check.
03 23 40 46 CMP All right. ... warning lines. Jim can pick up the checklist.
03 23 40 54 CDR Okay, you're there.
03 23 40 55 CMP Good.
03 23 40 56 CDR I'll - I'll get the numbers. They recommend 25 and 26.
03 23 40 58 CMP Right. If 25 doesn't come up, I'm going to punch it in.
03 23 41 02 CDR What --
03 23 41 03  CMP  Twenty-five.
03 23 41 04  CDR  Okay. Well, you've got 16 minutes, so you're in good shape.
03 23 41 10  CMP  Okay. Twenty-five is Acrux.
03 23 41 25  LMP  Do you want to start an EMS DELTA-V test over there --
03 23 41 26  CDR  Yes.
03 23 41 27  LMP  -- and null bias check.
03 23 41 28  CDR  Okay.
03 23 41 29  LMP  Okay.
03 23 41 37  CMP  Twenty-six; comes up the right stars.
03 23 41 41  CDR  Good.
03 23 41 44  CMP  And 26 is Spica.
03 23 42 03  CMP  Oh, yes, there's Gienah; this must be Spica.
03 23 42 26  CDR  Four balls 1.
03 23 42 27  CMP  Beautiful.
03 23 42 29  CDR  Torquing angles.
03 23 42 32  CMP  One, 2, 3 - Okay, I'll torque them on a minute.
03 23 43 03  CDR  Okay.
03 23 43 12  CMP  What's the sextant star?
03 23 43 14  CDR  Well, wait a minute. Oh, you want to do it right here? Okay, sextant star is number 30.
03 23 43 23  CMP  Aaah.
03 23 43 24  CDR  Huh.
03 23 43 38  CDR  Take a look at your shaft and trunnion, if you can.
03 23 43 41  CMP  Yes.
What's that? NOUN 99?

Yes. Let's see - 90 --

Okay, it should be 192.8 and 111. You've got 192.1 and 114.

That's pretty close.

Yes, that's at 192 - 192.8?

What are you doing?

...

Why don't we just - Let me do a --

Do you want to just take those numbers?

No, let me do a P - P30-P41 real quick and get you to - the right attitude.

Well, we want to do the sextent star check on their attitude anyway.

It doesn't matter.

Yes. Well, wait --

111 - 192.8 --

Okay.

-- and 111.

There, I - you're in good shape.

Yes, it's there.

Okay. Good. Okay, why don't you clean up down there? I'll do a 30-41.

Okay.

I want to go to P00, okay?

Okay, you got it.
3.1, is that all?
Yes.
They're really getting down to nitpicking. Okay, I'm all cleaned up down here, Dave.
Okay.
Your TSBs are getting pretty full, aren't they?
I think there's a lot of space in the bottoms of them.
Well, if you guys leave today, I'll - I'm going to get the JETT bag out and start filling it up with that stuff.
Yes.
Okay, we're in P41. Trim it out. There, attitude looks pretty good. Okay. Why don't you come up here and do your EMS check?
Okay, Dave.
3.1. God, that's a nothing.
Yes, they're really splitting hairs.
That's all right, I wouldn't feel too comfortable at 24,000 feet on the verge of a 22,000-foot mountain.
Yes, well, this'll bring you up 10,000 feet.
Yes.
Or thereabouts.
Are you running a null bias check here?
No. I just started to set it up now when you got --
Oh. Okay.
-- the numbers in.
Did you run the DELTA-V test?
03 23 46 56 CMP Yes. That's good. It's a minus 21.9.
03 23 46 59 LMP We've got 10 minutes to go.
03 23 47 01 CDR You clock's set, but for some reason it isn't set exactly right. I think that timer drifts on you.
03 23 47 08 LMP Drifts? Yes.
03 23 47 13 CMP Yes. I suspect it very well might.
03 23 47 21 LMP Have we got the DAP set in there that we want?
03 23 47 24 CMP Yes.
03 23 47 25 LMP Four jets?
03 23 47 26 CDR Four jets.
03 23 47 30 CMP ... start.
03 23 47 32 CDR Okay, we got IMAG --
03 23 47 33 CMP Yes, I've got 21101.
03 23 47 35 CDR Let's go back to --
03 23 47 36 CMP That gives us four jets.
03 23 47 38 CDR Yes. Let's go check the waste --
03 23 47 39 CMP I ch - I put that in.
03 23 47 40 CDR You already did that?
03 23 47 41 CMP Yes.
03 23 47 42 CDR Okay.
03 23 47 43 CMP That's the only thing there was to put in.
03 23 47 44 CDR Okay. Roll, pitch, and yaw looks okay.
03 23 47 52 LMP Okay, you want to get ROT CONTROL POWER, NORMAL, two, to AC/DC?
03 23 47 56 CDR AC/DC.
03 23 47 57  LMP  ROT CONTROL POWER, DIRECT, two, to MAIN A, B.
03 23 47 58  CDR  MAIN A, MAIN B.
03 23 48 02  LMP  I didn't get the chance to check the DET.
03 23 49 09  CDR  Looks like it's about 3 or 4 seconds off, and I'm really not sure I understand why.
03 23 48 17  CMP  Yes, you can turn it right and the next time you look it's - Oh, ..., forgot to give you that.
03 23 48 26  CDR  That's all right. I put your film in your TSB.
03 23 48 29  CMP  Okay.
03 23 48 32  LMP  Okay BMAG MODE, three, are RATE 2.
03 23 48 34  CDR  They're in RATE 2.
03 23 48 36  LMP  And we're at CMC in AUTO?
03 23 48 38  CDR  Yes, yes.
03 23 48 39  LMP  We'll wait until the DELTA-V test is complete to do the trim?
03 23 48 47  CDR  DELTA-V test is complete, and it's .8 feet per second per 100 seconds. It's getting better.
03 23 48 54  CMP  Yes. ...
03 23 48 56  LMP  Okay, do you want to - do you want to trim?
03 23 49 03  CDR  Huh? Trim?
03 23 49 04  LMP  I said you want to set DELTA-Vc, I suppose?
03 23 49 08  CDR  Ah, let's set - Yes, better - Your 100 is probably good. DELTA-Vc should be 3.1.
03 23 49 15  CMP  Yes, let's -
03 23 49 22  CDR  You know what? That's yours.
03 23 49 31  CMP  Okay, 3.1. I've got a 103.1 set in there.
Okay, EMS FUNCTION, DELTA-V.

DELTA-V.

Okay, do you want to trim it?

Yes, we might as well. Get it all in plus-X. Okay?

Yes. Okay, push up close to ... Yes.

Okay, burn time is 20 seconds.

Okay.

Spacecraft roll aligned, Al?

Alined.

SPACECRAFT CONTROL, CMC in AUTO.

CMC, AUTO.

MANUAL ATTITUDE, three, to RATE COMMAND.

RATE COMMAND.

DEADBAND, MIN.

MIN.

RATE, LOW.

LOW.

BMAG MODE, three, ATT 1/RATE 2.

ATT 1/RATE 2. Wellll --

GDC ALIGN.

What happened to your TRANSLATION CONTROL POWER?

Yes, that's what I'm wondering.

Where's the THC POWER? Well, now --

Get that down there.
03 23 50 30 CDR  Oh, down there?  Okay.
03 23 50 31 LMP  Five minutes.
03 23 50 32 CDR  (Sigh)
03 23 50 33 CMP  Why - why go ATT 1/RATE 2, though?
03 23 50 34 LMP  Do it for a GDC ALIGN.  That doesn't make sense.
03 23 50 37 CDR  No?  No, it sure doesn't, does it?
03 23 50 39 CMP  Why the GDC ...?
03 23 50 55 LMP  And we're standing by for 5 minutes.
03 23 50 58 CMP  Okay, we're at 6 minutes.
03 23 51 21 CMP  Have you timed this thing, Dave?
03 23 51 23 CDR  Yes.
03 23 51 24 CMP  Okay.
03 23 51 35 CMP  GDC alined.
03 23 51 37 LMP  Okay.  Standing by for 5 minutes.
03 23 51 39 CMP  Okay, we're at 5 minutes.
03 23 51 40 CDR  Okay, at some point you got to go ATTITUDE 1/
  RATE 2 to have your SPS --
03 23 51 46 CMP  Right.
03 23 51 47 CDR  -- in attitude hold.  Let's not call down anymore.
  So you might as well do it now.
03 23 51 51 LMP  ... ATT 1/RATE 2, ... 42, GDC ALIGN.
03 23 51 54 CMP  I don't understand that.
03 23 51 56 CDR  I don't either.
03 23 51 57 CMP  Okay, we're in ATT 1/RATE 2, just in case we need it.
03 23 52 04 CDR  Okay, we're at 5.
Okay, TRANSLATION CONTROL POWER, on.

TRANSLATION CONTROL POWER, on.

Hand controllers, armed.

Armed.

Okay. Did you get the 85 display? I guess it's --

Yes.

-- ... I got the ... right now.

Okay. After the burn, there's not much. I think we're in good shape. I'll tell you what we might do. After the burn, let's pressurize the LM.

Yes.

And let you get suited. And it might be better if you just pull your suit out and stuck it in the corner and got all that stuff out of the tunnel. ..., we can put it here and --

Yes.

-- down under that couch, where we've been putting it.

And try to ... it back. Yes.

Yes, and I think there's enough room for you to get suited there.

Yes, I think so.

Then we can start working on that ... I'd like to do that landing site thing - the P24.

And I'll be getting all the transfer gear.

Yes, get all the transfer gear. Yes. As a matter of fact, you can start taking it over, once we get the tunnel opened up.

Yes.
Boy, I tell you, we go by that landing site awful fast.
We really do.
Yes, you really go zipping by.
Did you get a good picture of it?
No.
It was a little too dark.
I just - All I could do was point down, and I just picked up the rille going past the edge of the window. I was just too slow getting to it, so - I knew I didn't have much time, but I didn't know it was that fast. I didn't realize we were going to get through it that quickly.
Did it look low?
Yes.
Yes. You know, doggone it -
The sector's right there, boy.
- - ... In the LM when - when we'd do that, we'd run it several times across PDI with the window. We should have done that in the LMS with you. I didn't - I didn't -
We did.
- - ... about the - No, you never came over there and watched us do it from 9 miles.
Oh, I -
...
Oh, I see. Yes.
Because it really moves.
Yes.
Really give you a feeling for it.
I never thought about the TV pass, though, to tell you the truth.

Tell them it went awful fast?

They could tell, I think (laughter).

Could you - did you have any --

Well, all - all I could do was stick it in the window and catch - catch the rille going out of the edge of the picture, and that was it, Dave. So, all I saw was - all I saw was St. George and - and Elbow Crater.

Could you see them?

Yes. And they were gone.

Did you get a good chance to point it at the Apennines coming up, though?

Yes. Yes.

Did you see the mountains on the horizon and all that stuff?

Yes.

Well, that ought to be pretty impressive. Well, we're down to 2 minutes, Jimmy.

And don't - don't forget on that Activation Checklist that one of them has that ECS stuff, and the other's got - Make sure we have both of those. Yes.

One minute. Okay, 20-second burn ... Jim will count because your clock is sort of ...

... on that, Jim?
Okay.
...
43.
Roger.
Ten seconds. Ready -
MARK; the burn time. DSKY's count?
Roger. So is the EMS.
Here's the countdown. ... 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, and -
ZERO.
Now trim it a little bit. Yes, that's ... That's good, Al. ... 
What did they want it trimmed to?
They didn't say. Why don't you - Could you take that to 3/10ths?
They didn't want us to trim any - -
That's for retrograde ...
There you go.
Okay.
.1, .2, and .0.
Okay.
Okay, we got everything?
Whoo.
All the data?
Yes.
Okay. EMS FUNCTION, OFF.
03 23 57 32  CMP  OFF.
03 23 57 33  CDR  EMS MODE, STANDBY.
03 23 57 35  CMP  STANDBY.
03 23 57 36  CDR  RHC and a THC, lock.
03 23 57 37  LMP  Lock.
03 23 57 39  CDR  TRANSLATION CONTROL POWER, OFF.
03 23 57 41  CMP  OFF.
03 23 57 44  CDR  We got a POO after that?
03 23 57 45  LMP  Yes - yes.
03 23 57 47  CDR  POO and a VERB 66.
03 23 57 49  CMP  Okay.
03 23 57 50  CDR  ROT CONTROL POWER, DIRECT, OFF.
03 23 57 52  CMP  DIRECT, OFF.
03 23 57 53  CDR  EMAG MODE, three, RATE 2.
03 23 57 54  CMP  RATE 2.
03 23 57 55  LMP  TAPE RECORDER going off.
03 23 59 08  CDR  ...?
03 23 59 09  CMP  ...
03 23 59 10  CDR  Okay, there's a maneuver to P52 high-gain attitude. FDOI [sic] trim required; roll, pitch, and yaw. Well, beautiful, they didn't give us that one. Did they? Did they give us an attitude to go to, Jim - after the burn?
03 23 59 29  LMP  No, I don't think so. It's not on the pad.
03 23 59 45  CMP  We don't have it. Huh.
03 23 59 57  CMP  Well, for God sakes. They forgot it completely.
<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 00 00 06</td>
<td>CDR</td>
<td>Okay. They're not too with us this morning.</td>
</tr>
<tr>
<td>04 00 00 09</td>
<td>CMP</td>
<td>What - what kind of high-gain antenna angles do we get in this attitude?</td>
</tr>
<tr>
<td>04 00 00 15</td>
<td>LMP</td>
<td>Why don't you look for it - -</td>
</tr>
<tr>
<td>04 00 00 16</td>
<td>CMP</td>
<td>We'll just stay here.</td>
</tr>
<tr>
<td>04 00 00 17</td>
<td>LMP</td>
<td>-- ... 1427</td>
</tr>
<tr>
<td>04 00 00 18</td>
<td>CMP</td>
<td>Let's look in the book and see if that's in a clear area.</td>
</tr>
<tr>
<td>04 00 00 21</td>
<td>CDR</td>
<td>Which book? Where's the ... at?</td>
</tr>
<tr>
<td>04 00 00 23</td>
<td>LMP</td>
<td>Right up there. Do you want - want to clean up of SIM bay here, Dave?</td>
</tr>
<tr>
<td>04 00 00 29</td>
<td>CDR</td>
<td>Yes, okay. X-RAY to STANDBY.</td>
</tr>
<tr>
<td>04 00 00 33</td>
<td>LMP</td>
<td>X-RAY to STANDBY.</td>
</tr>
<tr>
<td>04 00 00 34</td>
<td>CDR</td>
<td>X-RAY - ALPHA RAY/X DOOR to ALPHA ON.</td>
</tr>
<tr>
<td>04 00 00 38</td>
<td>LMP</td>
<td>Okay, that is ALPHA ON.</td>
</tr>
<tr>
<td>04 00 00 40</td>
<td>CDR</td>
<td>Okay. GAMMA RAY, EXPERIMENT, ON.</td>
</tr>
<tr>
<td>04 00 00 43</td>
<td>LMP</td>
<td>GAMMA RAY, EXPERIMENT, ON.</td>
</tr>
<tr>
<td>04 00 00 46</td>
<td>CDR</td>
<td>GAINSTEP to shield on.</td>
</tr>
<tr>
<td>04 00 00 48</td>
<td>LMP</td>
<td>GAINSTEP to shield on.</td>
</tr>
<tr>
<td>04 00 00 50</td>
<td>CDR</td>
<td>MASS SPEC --</td>
</tr>
<tr>
<td>04 00 00 51</td>
<td>LMP</td>
<td>Wait, hold it. GAINSTEP to shield on?</td>
</tr>
<tr>
<td>04 00 00 53</td>
<td>CDR</td>
<td>Yes.</td>
</tr>
<tr>
<td>04 00 00 54</td>
<td>LMP</td>
<td>Is that the midprogression?</td>
</tr>
<tr>
<td>04 00 00 55</td>
<td>CDR</td>
<td>I don't know. What is it?</td>
</tr>
<tr>
<td>04 00 00 56</td>
<td>LMP</td>
<td>It's the SHIELD OFF, down.</td>
</tr>
</tbody>
</table>
04 00 00 58  CDR  What's that?
04 00 00 59  CMP  Shield on for the GAINSTEP.
04 00 01 02  CDR  Which position is that?
04 00 01 05  CMP  Center.
04 00 01 06  LMP  Okay, the shield's on.
04 00 01 07  CDR  I don't know. It doesn't say that over there.
04 00 01 08  CMP  GAINSTEP is in up.
04 00 01 10  CDR  Okay, MASS SPEC EXPERIMENT to STANDBY.
04 00 01 14  LMP  Okay, MASS SPEC EXPERIMENT is STANDBY.
04 00 01 19  CDR  PAN CAMERA to off.
04 00 01 23  LMP  PAN CAMERA - You got the mode? For the PAN CAMERA ... --
04 00 01 29  CMP  It's the ... POWER.
04 00 01 30  CDR  Oh, POWER - PAN CAMERA POWER to off. I'm sorry.
04 00 01 32  LMP  Verified.
04 00 01 33  CDR  All right, that's all.
04 00 01 35  LMP  Okay.
04 00 01 52  CDR  Okay, let's -
04 00 01 55  LMP  What does that look like? I said that to you.
04 00 02 06  CDR  Oh, my. Well, let's see. Getting range and no coverage, though. Next thing we go to is landing-site observation attitude at 96:55, which is 015, 290, and 000. So that ought to be a good attitude. You see we come down through here and do all that.
04 00 02 31  CMP  Yes.
04 00 02 32  CDR  I guess we'd better --
04 00 02 33  CMP  Well, we don't have anything else, do we?
S-band. Says P52 HGA attitude, if DOI trim required. Well, we'll give it to him. And the next attitude we have to do - it looks stable for maneuver, because they're surely to give us a - an extra maneuver.

They didn't give us that. Here we come around here, and the next thing we have to do is burn status - maneuver to this attitude. Okay?

Yes.

So let's - let's go there.

That'll be Charlie there, huh? That's not a good - that's not a good high-gain attitude.

It's not?

But it's better than the one we've got, though.

How can you tell we're there?

Huh? Well, the landing-site observation attitude is not a good high gain.

Oh, it's not?

Huh-uh. The high -

Well, let's -

-- That's - that's corrected better than what we've got.

Well, we got OMNI now, anyway, don't we?

Yes. Now we can just sit here. You've got OMNI B here or OMNI Charlie in that other attitude.

Let's see, we have ACS at 96:30. Okay, and then we only got 20 minutes to maneuver. I guess you're right. I guess that would be better than - kind of - We only have OMNI, but that's too bad, I guess. But at least it's better than this one.
04 00 04 16 CDR 290, 0 ... the whole 180 degrees down ...

04 00 04 29 LMP Got a long ways to go.

04 00 04 30 CDR So we might as well do it. Go to ... Okay. Next order of business is the tunnel.

04 00 04 49 LMP Al, I want to change lightweights with you. I'm going off comm.

04 00 05 15 CMP Okay, and I'd better put some biomed on.

04 00 05 17 CDR Oh, yes, that's right. Why don't -

04 00 05 33 CDR You're going to have some time - Oh, you got to get your suit on.

04 00 05 46 CDR Why don't - why don't we do the tunnel and get that stuff in here. I don't think it's going to be in the way too much, once we get your suit out of the way. Oh, do your biomed stuff, and we'll get all the transfer stuff together. Then we'll have it all, and we won't have to do any more shuffling.

04 00 06 16 CDR I - I'll get it. Jim, go ahead and get the transfer stuff. I'll - That's the wrong thing, Jim. You're in the right wall.

04 00 06 38 CDR Need any help, Jimmy? What - UCW2 [?]. Oh, that thing. Yes, okay. Where it is? I'll go get it. Oh, I know where it is; it's in A-8.

04 00 07 13 CDR Whew. (Clanking)

04 00 07 35 CDR There we go. (Clanking)

04 00 07 52 CDR What happened?

04 00 08 07 LMP ...

04 00 08 10 CDR Okay. (Clanking)

04 00 08 37 CDR Did you leave Al one jettison bag?

04 00 08 44 LMP Okay, I'll check.

04 00 08 47 CDR Okay. How many did you have to start with?
(Clanking) No, I really guess not. Okay, we'll just take one. Okay, LM Data File, huh? What should - what should be in it, Jim? Huh? Yes. I know this is in it; I saw it the other day.

No, it's - it's an extra one of ours. I had - that's a backup. Command module. I had them put on. (Laughter) It's the only kind I understand. It's not going to work (laughter). Here, I know where I'll put it, right in here. Right there.

Okay, let's check it.


Got it.

Got it.

Star charts; you have them.

Get the ...

All right. I'd like to time it ...

(Maybe I got a PRD, Jim.

There it is. I've got to get Al's, really. Yes.

What?

It wasn't? Why? Really? Oh, let me write this stupid thing down.
04 00 13 07 LMP  ... 

04 00 13 13 CDR  Do you know where your PRD is, Al? Yes, give me to it [sic]. I'm switching you right now.

04 00 13 35  (Clanking)

04 00 13 37 CDR  Some day they may want these readings. They're in here. They're in here at the beginning of the day, if you ever get around to it. Okay, Jim, my PRD. I thought I just handed you one. Huh?

04 00 14 11 LMP  ... 

04 00 14 31 CDR  Oh, shoot, I don't see it, Jim. No, don't check it off; we'll look for it, as we go around. Oh, is that the list you're checking? Oh, come on. Okay. Yes. Yes, I put mine on. Yes.

04 00 15 11 LMP  ... 

04 00 15 14 CDR  Yes, we're - Yes, but - Yes, okay. I've got mine in my pocket. Okay. Yes. Got that? Yes. Yes.

04 00 15 42 LMP  ... 

04 00 15 44 CDR  Okay, yes - yes. What I - We also want to take these over and bring the new ones back. CWGs.

04 00 16 04 LMP  ... 

04 00 16 07 CDR  Yes.

04 00 16 11 LMP  ... 

04 00 16 14 CDR  Yes.

04 00 16 15 LMP  ... 

04 00 16 28 CDR  Yes. Yes, we have them on.

04 00 16 31 LMP  ... 

04 00 16 33 CDR  I'm going to have mine in my pocket, in this thing when I bring it over. So I got mine. Do you want to take yours? Okay, it's in the tube, Jim.
04 00 16 48 LMP ... 
04 00 16 50 CDR Yes. 
04 00 16 53 LMP ... 
04 00 16 58 CDR Yes. I was going to put them in my pocket, too, before I got hooked around. Here, I can stick it in this pocket up here - in my strap-on pocket. When are we going to put them over there? Okay. 
04 00 17 20 LMP ... 
04 00 17 22 CDR Yes, okay. 
04 00 17 24 LMP ... 
04 00 17 25 CDR Yes, got mine ready to snap on. 
04 00 17 27 LMP ... 
04 00 17 30 CDR Okay. 
04 00 17 32 LMP ... 
04 00 17 36 CDR Yes. 
04 00 17 38 LMP ... 
04 00 17 39 CDR Okay. 
04 00 17 41 LMP ... 
04 00 17 47 CDR We got both Activation Checklists? Sure, huh? Okay. 
04 00 18 12 CDR Huh? 
04 00 18 13 LMP ... 
04 00 18 14 CDR Yes. Well, all right. We're going to go early. 
04 00 18 20 LMP ... 
04 00 18 27 (Clanking) 
04 00 18 35 LMP ... 
04 00 18 39 CDR I'll put it in R-3. 

CONFIDENTIAL
04 00 18 51  CDR  The what?
04 00 19 35  (Clanking)
04 00 19 54  LMP  Get all ...?
04 00 19 56  CDR  Yes.
04 00 19 57  LMP  ...
04 00 19 59  CDR  Okay.
04 00 20 05  (Clanking)
04 00 20 07  CDR  Yes.
04 00 20 08  (Clanking)
04 00 20 49  CDR  Well, I don't think we've left you with too much to do, Al. I hope not. Keep an eye on those guys down there.
04 00 21 02  CMP  ...
04 00 21 05  CDR  Huh?
04 00 21 06  CMP  ...
04 00 21 08  CDR  Yes, they really have.
04 00 21 12  CMP  ... watch the systems ...
04 00 21 17  CDR  Let them watch the systems and you do the flying, which is the way it ought to be.
04 00 21 43  (Clanking)
04 00 22 22  LMP  ... all through down there?
04 00 22 35  (Clanking)
04 00 22 42  LMP  ...
04 00 23 06  LMP  ... wait a minute ...
04 00 23 15  LMP  Yes.
04 00 23 18  CDR  Jim, here's your - thing.
Okay, I guess the - next thing we ought to do - when you get ready - is go through the tunnel. No, I don't need that. Systems Checklist.

I think you had the Systems Checklist, didn't you? Oh, here it is. Okay. Well, that's your job, because - Say again?

Think we ought to try and get them on the high gain? Hey, Al, you think we ought to try to get them on the high gain?

Well -

I mean - Okay. I could easily go through it, because I could tell which ones to check - skip through. ... get.

Turn around here, Jim.
Hey, we're getting them. How about that. Yes. There, got a lock.

Roger. Houston; 15 here. We had a good burn and have a burn report for you.

Okay. On time; burn time was about 18 or 19 seconds. The residuals were minus .1, plus .2, plus .2; DELTA-V_C was plus .8, and the G&N has us in a 59.4 by 10.3.

(Yelling) In case you guys are wondering, I'm dumping.

Fuel cell purge, huh? Okay, fuel cell purge. Two for 2 hours. Two of them on.

(Yelling) Hey, we're going to maneuver.

Yes, must be ... low.

...?

Well, we're getting there. Slowly.

What?

We're getting there slowly.

...

Yes. I think so.

When you almost get there, how about ...?

Okay.

...
All right.

... coming up ... to AOS ... up to - be ready for AOS.

I think I'm just about ready.

...

Yes. Where is the tape? Anybody know?

It's over - ...

Okay.

...

Oh, what the hell.

Hey, Al.

(Yelling) Yes.

...

(Yelling) What?

...

(Yelling) What?

Did you ...?

(Yelling) No. You guys are too far ahead.

Okay. Let's see.

Ready?

You want P - Okay.

...

Okay.

Okay, there, Endeavour. How do you read the Falcon on - -
Hey, loud and clear.
Say again?
Beautiful!
Good.
And, Al, how do you read me?
Read you loud and clear, Jim.
Ah, you're beautiful.
Hey, did you say something about Tephem? Did you want a Tephem, Dave?
Stand by.
Okay. I'll give it to you if you want.
Stand by. Configure for SIMPLEX A.
Okay.
Okay, Al. How do you read on A?
Loud and clear, Dave.
That's nice.
And, Al, how do you read me?
Loud and clear, Jim.
Very good.
Okay. Now you can give me your Tephem.
Okay.
Ready to copy?
Go.
04 02 24 20 CMP Just like SIM. All balls in the $R_1$. $R_2$ is 32251. $R_3$ is 26157.
04 02 24 31 CDR Okay. All balls, 32251, 26157.
04 02 24 34 CMP Great.
04 02 24 44 CMP Want a clock sync?
04 02 24 46 CDR Stand by 1.
04 02 25 32 CDR Okay, Al. VERB 06 - 6 - VERB 06 NOUN 65. I'll give you a mark.
04 02 25 37 CMP Give me a mark. I'm waiting.
04 02 25 43 CDR 3, 2, 1 -
04 02 25 45 CDR MARK.
04 02 25 46 CMP Okay. 98:25:45.60.
04 02 25 53 CDR Okay. 25:45.60.
04 02 25 56 CMP Roger.
04 02 26 06 CMP And I'm coming up to get the umbilical now.
04 02 26 08 CDR Read you loud and clear.
04 02 26 19 LMP Okay. Let's hope so.
04 02 26 48 CDR Okay, Endeavour. Another NOUN 65 if you're ready.
04 02 26 56 CMP On your mark.
04 02 26 58 CDR 3, 2, 1 -
04 02 27 00 CDR MARK.
04 02 27 01 CMP Okay. 98:26:59.60.
04 02 27 07 CDR Okay. We're within 3/100ths.
04 02 27 10 CMP Okay.
04 02 27 44 CMP Hello, Endeavour - Houston, this is Endeavour, loud and clear.
Okay, you got it. NARROW and REACQ.

TIME SKIP

Okay. Understand, Al. Get the DAP reset, and the tape meter looks like it works fine.

Okay, Falcon; Endeavour. I got the hatch in and - you want to verify your hatch closed?

Okay, that's verified. Closed and locked.

Okay, I'll do a hatch integrity check then.

Okay.

Okay, Endeavour; Falcon. Our radar checks out okay, and your B-3, OFF, and transponder, off, are no longer required.

Okay. Thank you.

And, Al, we're going B data.

Okay.

Falcon, Endeavour. Your transponder checked out okay.

Oh, very good. Thank you.

Okay, Falcon; Endeavour. We're maneuvering to SEP attitude.

Okay.

Okay, Endeavour; Falcon. Have you vented the tunnel?

Roger.

Okay; thank you.

Hear that noise with us, Al?

Okay.
04 03 57 59  CDR  Okay, Al, are you about in attitude now?
04 03 58 03  CMP  Right, Dave. About 5 degrees to go.
04 03 58 05  CDR  Okay. We're down to --
04 03 58 09  LMP  Oh, yes. We should --
04 03 58 10  CDR  -- just about everything and it's all shipshape.
04 03 58 13  CMP  Good.
04 03 58 21  CDR  Even the old broken tape meter seems to work.
04 03 58 27  LMP  That figures.
04 03 58 58  CMP  Okay, we're at attitude now.
04 03 59 01  CDR  Okay; thank you.
04 04 03 15  CMP  Okay, Falcon; Endeavour. Doing the trim maneuver.
04 04 03 18  CDR  Okay.
04 04 03 53  CMP  Okay. We're setting at attitude and I've got 10 minutes --
04 04 03 56  CMP  MARK -- to go.
04 04 03 57  LMP  Okay, we're right with you.
04 04 04 09  CDR  And we're right on the attitude.
04 04 04 11  CMP  Okay, good.
04 04 04 49  CDR  Okay, Al, at 5 minutes to go, we need a -- 06 20. Okay?
04 04 04 56  CMP  Okay, you want it now?
04 04 04 59  CDR  No, let's wait down until 5 minutes. Okay?
04 04 05 02  CMP  Okay.
04 04 05 03  CDR  I'd like to give them as much time on the platform as we can.
04 04 08 44  CMP  Coming up on 5 minutes in 10 seconds.
Okay, I'll give you a mark.

3, 2, 1 -

MARK.

Okay. 35975, 10818, 35995.

Give me that last one again.

Okay. 35995.

Okay. 35915, 10818, 35995.

The last two were okay. The first one was 35975.

Okay; 75. I don't write too good with gloves on.

Roger.

Ten seconds.

Okay, we're on the capture latches. Good.

Roger.

And you're on your own.

Okay. Good clean SEP.

Okay, Ed; if you think we can't get there for the P24.

Okay. We'll hold this.

Okay. Falcon's going to yaw left.

Okay. Falcon's going to pitch up 90.

Roger.

And you got four good-looking gear.
And, Falcon; Endeavour. Looks like you got one radar there that's - rotating quite freely.

Okay. We've got you in sight; we're looking straight at you. It's really pretty.

Roger.

Roger. We're LO bit rate and AFT OMNI.

Roger. PITCH, 155; YAW, minus 50.

Roger. HI bit rate.

And, Houston, we're ready to go with the DPS throttle check whenever you are.

Okay.

TIME SKIP

Al, we're going to DATA.

Okay, Jim. Recorder's running.

Okay, nice recovery over there.

Think I'm minus at least one fingernail, though.

Oh, gad. Where did you lose it?

On - as a matter of fact, on A-1 when I went after the sextant adapter.

Oh, my!

(Laughter) That's okay, just a little loose.

So long as you're not leaking.

I'm not, no. Okay, I'm all set up for the burn here, I've done P40, done the sextant star check, and everything's looking pretty good. And I've got 14 minutes to go.
Okay, very good. Oh, yes, I wanted to tell you a little bit about the landing site there - on the - on the craters. There's a - Earthlight Crater, of course, is a lot sharper than Index. And then there's a great big one to the east of Index, which is the same size and quite sharp, and I think - you won't have any trouble as long as you see the Matthew, Mark, Luke, and Index. Index is a pretty subtle crater, and there probably won't be much shadow in the bottom of it at all, when you get there.

Yes. Okay. I - I - I know where it is, I think, well enough in location so I can look for the - for the shallow depression.

Okay. Both of those will probably have shadow in them.

But - gee, they're real super; you can't miss.

Falcon, Endeavour.

Go ahead, Al.

Okay, do you want the NOUN 81 values for this burn now, or do you want to wait until after?

After.

Okay, I've gone through the primary gimbal check and turning on number 2 now.

Roger.

Gimbal drive check.

*** we feel like we're right there with you.

All looks normal.

Good show.

FDI scale 5/5. RATE, HIGH, and looks like we're going.

Good.
Everything checks fine; 2 minutes and 12 seconds.

Okay.

Okay. DELTA-V THRUST B is ON. And B PILOT VALVE is closed.

Okay.

One minute.

Right with you on the time.

Average g.

Roger.

ULLAGE.

Thank you.

THRUST, ON.

THRUST, off. What a kick in the tail!

Didn't I tell you?

You did! Had to see it for myself.

That's great, isn't it?

Fantastic, man; you really move!

Yes, man. That's like really flying, isn't it?

Yes, sir.

Did you get it all in, Al?

Sure did, Dave. Right down to the gnat.

Very good.

Sorry about that. I had - only had 9/10ths residual in X and I - I trimmed it out. That short burn constant made it a lot better.

Good.
04 05 41 38 CMP And I'm in a 65.2 by 54.8.
04 05 41 43 CDR 65.2, 54.8. Okay.
04 05 42 19 CDR How about that! We have you in a 65.2 by 54.6.
04 05 42 23 CMP Super.
04 05 45 12 CDR Al, how do you read now?
04 05 45 14 CMP I read you 5 square, Dave.
04 05 45 16 CDR Okay. We had an antenna change called here and
sounds like you're pretty good, so we'll just
stay with you this way.
04 05 45 24 CMP Okay.
04 05 46 36 CMP Now.

TIME SKIP

04 06 12 48 CMP Hello, Houston; Endeavour. Roger. Stand by 1.
04 06 12 56 CMP Okay, Houston. The burn got off on time. Burn
time, 4 seconds, \( V_{\text{GX}} \) was minus 0000.9, and I
trimmed that to - zero --

TIME SKIP

04 08 06 02 LMP Houston, Falcon. Go.
04 08 06 14 LMP Roger, Ed. The ASCENT BATs were on at 103:50:45,
and I'll check ED BATs now.
04 08 06 50 LMP And, Houston, this is Falcon. ED batteries both
check at 37 volts.
04 08 07 04 LMP And LMP. Go ahead.
04 08 07 17 LMP POO and DATA. And go ahead with the pad.
04 08 07 32 LMP Yes? Okay.
Ed, if you're reading us, you ought to call us after the - the up-link. We cannot read you. We're not getting the up-link either.

Locked up yet?

No.

Here it comes; don't change it. It's coming in.

THROTTLE control, AUTO.

AUTO. Read you loud and clear, Ed. I'm ready for that update now.

Roger. 104:30:08. 54; cross range, plus 0003.3; DEDA 231, plus 56943.

Roger. Okay, your T - your THROTTLE in min? Okay. THROTTLE, min.

Okay.

THROTTLE, soft stop.

Okay.

RATE SCALE, 25 DEGREES PER SECOND.

25.

ATTITUDE/TRANSLATION, 4 JET.

4.

Check DFS, APS, RCS, ECS, EPS. Okay?

Looks all right.

Did you check the RCS? Okay. ECS look all right?

Yes.

If we should be up-linked, Dave, I'll need a - VERB 47.

Okay.
... computer, because -
Roger. Thank you.
Thirty-nine point - How's that?
(Tone)
(Laughter) ENTER.
Okay. Looks like I just screwed. Okay.
Okay. That's good.
Get - I think we ENABLE on the - S-BAND?
Okay. Houston, how do you read Falcon?
Houston, Endeavour. Loud and clear.

*** while you work, I got a couple of short goodies ***
Hey, that all sounds real good, Karl. And, as you can see, I'm right in the middle of a P52 here. We'll have the second star and gyro torquing angles in just a second.
And if you've got those torquing angles, I'll get them on the minute.
*** read them down to us, Al.
Okay, Karl, I'll read them to you. P52 stars were 01 and 36. The torquing angles were minus three balls 28, minus three balls 58, plus three balls 12. And they were torqued out at 119:05 on the minute.
05 01 53 08 CMP  Hello, Houston; 15 - Endeavour.
05 01 53 21 CC  Endeavour, this is Houston. How do you read?
05 01 53 23 CMP  I read you loud and clear.
05 01 55 32 CC  Endeavour, this is Houston. How do you read? And we seem to have a small comm problem. Please stand by.
05 01 55 41 CMP  Roger, Houston. Endeavour standing by, and I'm reading you 5 square. Houston, Endeavour is standing by, and I'm reading you 5 square.
05 01 55 55 CC  Roger. And I'm reading you loud and clear with a good bit of noise over the top of you.
05 01 56 01 CMP  Roger.

TIME SKIP

05 04 58 21 CMP  Ah, ha!
05 04 59 10 CMP  Hello, Houston; Endeavour. How do you read?
05 04 59 56 CMP  Hello, Houston; Endeavour.
05 05 00 26 CC  Endeavour, this is Houston. How do you read?
05 05 00 28 CMP  Okay, Houston. It looks like we're just going over the hill here. Just wanted you to know, it looks like my mission timer on the main panel is shot.
05 05 00 44 CC  Roger, Al. We read, and we would like to have COMMAND RESET and LOW BIT RATE.
05 05 00 50 CMP  Roger. COMMAND RESET; LOW BIT RATE. The - the timer's - -
05 05 00 53 CC  Probably - -

TIME SKIP
05 05 51 19 CC 15, this is Houston. We'd like to have you go WIDE BEAM on the HIGH GAIN ANTENNA and then to NARROW.

05 05 51 28 CMP Okay, Houston, this is Endeavour. Going WIDE BEAM; going back NARROW.

05 05 51 57 CC That's sounding better, Al. How are things going up there?

05 05 52 00 CMP Well, going okay, Karl. Looks like I've caught up a little bit, got all the dumps out of the way, and got the libration photography. It looks like I'm going to be handicapped a little bit because of the mission timer, but we'll press on.

05 05 52 17 CC All right. Our understanding on the mission timer is that, even though you tried to reset it, it still refused to count up. Is that correct?

05 05 52 24 CMP That's correct, and I thought what I'd do now is reset to zero and start.

05 05 52 34 CC Roger.

05 05 52 35 CMP Well, it counts from zero, Karl. I --

05 05 52 37 CC And for future reference we'd like -- Roger. You say it is counting, but it had - it had to start from zero to start counting again?

05 05 52 47 CMP Yes. Well, let me pick a random number, zero, count from there. I just tried to tell you the correct time, is all.

05 05 53 34 CMP Okay, Houston; Endeavour. Looks like we must have just run across a little funny there, Karl, because - it started okay now and is running.

05 05 53 46 CC Roger. Do you have a time source --

TIME SKIP
Very good, Al. That came through loud and clear.

Al, everybody down here is sending up bouquets to you for having done such a great job in a crowded period.

Well, thank you very much, sir.

And all the systems down here are looking in good shape as you go around the corner.

Okay, Karl. Thank you.

Think I'll get something to eat.

Endeavour, we'd like to have a NARROW BEAM, please.

NARROW BEAM.

Houston, Endeavour. How do you read?

Okay; reading you loud and clear, also.

Stand by 1.

-- and my PRD is 23149.

And standing by for a consumables.

Roger, Karl. Might as well get them now.

Roger, Karl. 140:00; RCS total, 61, 61, 61, 59, and 61; H₂ tanks, 70, 70, 48; O₂ tanks, 75, 78, 60.

Roger. Go ahead. I'll be doing a P52.
05 20 44 14 CMP  Well, that certainly sounds very good, Karl.
05 20 44 41 CMP  Roger, Karl.
05 20 47 10 CMP  And, Houston, if you're --
05 20 50 35 CMP  (Yawn)
06 03 29 55 CC  Endeavour, this is Houston. How do you read?

06 03 29 57 CMP  Hello, Houston; Endeavour. Loud and clear.

06 03 30 03 CC  Good to hear your cheery voice. How is everything up there?

06 03 30 06 CMP  Yes, just fine. It took us a little longer to lock up that time.

06 03 30 18 CC  Yes, a couple of minutes, but it still wasn't bad.

06 03 30 36 CMP  And, Karl, on the waste water dump, I overshot 10 percent, just a little bit, but I'm reading - I'm reading about 10 percent now.

06 03 30 48 CC  How much was that?

06 03 30 50 CMP  I'm reading 10 percent.

06 03 30 56 CC  Roger. Reading 10 percent now. I copy that.

06 19 14 13 CMP  Okay, Houston. Got it.

06 19 14 27 CMP  Oh, I've just had a very nice breakfast and getting ready for today's activities.

06 19 15 13 CMP  Okay. Stand by.

06 19 17 11 CMP  Okay, Karl. Stand by 1.

06 19 17 51 CMP  Okay, Karl, go ahead.

06 19 19 35 CMP  Roger, Karl. I understand. Yes, the SPS burn is going to be a - a nominal bank B burn - bank B only burn. But to get set up for it, we want to check, after cycle cryo fans, check that the EMS is off, get two EMS circuit breakers in, check that the group 5 circuit breakers are closed, and
check that the SPS pilot valves both are open at that time. And then down where it says, "CB STABILITY CONTROL, panel 8, and SPS 10 or 12," we'll make that a 10.

06 19 20 24 CMP Okay.
06 19 20 59 CMP Roger. Understand. You want the SPS PILOT VALVES, MAIN B, closed before DELTA-V THRUST B switch to NORMAL.

TIME SKIP

06 21 09 42 CMP Okay, Houston, I got 1 minute and 45 seconds to the burn.
06 21 11 02 CMP Average g.
06 21 11 15 CMP ULLAGE.
06 21 11 37 CMP THRUST, on.
06 21 11 51 CMP THRUST, OFF.
06 21 12 56 CMP Houston, Endeavour. If you're copying the DSKY, you'll see residuals: .2, .2, and .3; so no trim.
06 21 13 14 CMP Yes, sir; it certainly does.
DAY 8

07 04 14 37 CDR Well, very good. That's nice to know. Thank you much. Save the tapes for us, will you?

07 04 14 53 CDR Save the TV tapes for us, will you, please?

07 04 15 01 CDR Roger. See you around the corner.

07 04 15 20 LMP Okay. That's LOS.

07 04 15 22 CDR Okay.

07 04 15 49 LMP Why don't we have our helmet and gloves on? When we going to dock?

07 04 15 51 CMP Jim, never mind; never mind.

07 04 16 06 CDR Why do we have to have it this way?

07 04 16 09 LMP It'd help to have your glove on - and your helmet on just to keep the Sun out of your eyes, you know.

07 04 16 13 CDR Yes, but we don't have anything in the procedures, do we?

07 04 16 18 LMP Well, I think there's something about doing it optional.

07 04 16 21 CDR Huh! Yes, I think that's ...

07 04 16 42 LMP That sure was a sporty lift-off.

07 04 16 44 CDR I thought it was sort of springy. It looked - it's the soup.

07 04 17 39 LMP And it's tracking good.

07 04 17 42 CDR Our - Okay, turning elliptical.

07 04 17 45 LMP It's coming to 8.

07 04 17 47 CDR State vector's -

07 04 18 16 CDR Okay.
07 04 18 17 LMP Now you select ...
07 04 18 19 CDR Okay.
07 04 18 21 LMP Careful.
07 04 19 01 CDR Now we're to ...
07 04 19 05 LMP ... total.
07 04 19 09 CDR ...
07 04 19 17 LMP Okay, AGS - C component is exactly what the ground computed it: 19.1. They came up with - 19.
07 04 19 24 CDR Huh. Well - got a ... computer there.
07 04 19 36 CMP Okay. Four seconds to final comp.
07 04 19 39 CDR Okay, fine.
07 04 19 41 CMP Final comp.
07 04 19 44 CDR Did you get a bunch of good marks?
07 04 19 47 CMP Yes, sir. 19 and 18.
07 04 19 49 CDR Beautiful.
07 04 20 37 CDR Okay, take the end of your first mark and total the answer in minutes. Let me turn that down. Twenty-six minutes.
07 04 20 56 CMP Okay. I've got the answer now.
07 04 20 58 LMP Go ahead, Al.
07 04 20 59 CMP Okay, minus 69.1, minus 6.1, plus 16.1.
07 04 21 07 LMP Copy, minus 69.1, minus 6.1, and plus 16.1.
07 04 21 11 CDR Okay, want to get these numbers, Jim? I mean, tell me the elevation and so on.
07 04 21 25 CDR Okay, here's a NOUN 50 in.
07 04 21 27 LMP ... okay. ...
07 04 21 34 CDR Right. There's a ... you better jump. No, no, that's not NOUN 81.

07 04 21 38 LMP ...

07 04 21 39 CDR Here's NOUN 81.

07 04 21 40 CMP Okay, Dave, I'm maneuvering.

07 04 21 41 CDR Okay. Let us give you the numbers first, Al.

07 04 21 44 CMP Okay. Let us give you the numbers first, Al.

07 04 21 44 CMP Go ahead.

07 04 21 45 CDR Okay; 70.3; plus 5.9; and minus 17.7.

07 04 21 55 CMP Okay. That's official burn attitude.

07 04 21 57 CDR That's correct.

07 04 22 02 CMP Okay, ... I'm in attitude and only ... 

07 04 22 06 CDR Beautiful.

07 04 22 14 CMP ...

07 04 22 15 CDR Good.

07 04 22 18 LMP Well, I came up with exactly the same numbers as the PGNS, and X and Y, there's a difference of 2 and 3.

07 04 22 27 CDR Okay.

07 04 22 30 LMP I think we'll move. You got the burn attitude?

07 04 22 36 CDR I maneuver now?

07 04 23 11 CDR Okay, Endeavour, did you get our numbers for the burn?

07 04 23 58 CDR Maneuver.

07 04 24 41 LMP Roger. Copy. Okay. It's picking up ... for AGS.

07 04 26 09 CDR We have 3 and a half minutes to go, Al.
Roger. Understand. ...

Excuse me.

Yes, Dave. Get your engine.

Yes. ...

Should be a 3-second burn.

Okay, 3-second burn. Don't start until I tell you.

Go AGS to maximum to normal. Okay, at 30 seconds, it's ENGINE ARM to ASCENT, manual ullage, and PRO. And AGS to AUTO.

I should ... Nothing in it.

MARK; 2 minutes.

...

And everything looks good.

MARK; 1 minute, Dave.

Okay -

MARK; 1 minute.

Okay. AGS going to AUTO now.

Okay, AGS to AUTO.

Okay. You give me the time. I'll get the ullage.

Okay.

Okay.

Average g low. ABORT STAGE, push. ENGINE ARM to ASCENT. Standing by for 10 seconds.

Ullage. Trouble.

Three.
07 04 29 42  CDR  Okay. AUTO SHUTDOWN and AUTO IGNITION. We’re trimming.
07 04 29 48  CMP  Dave? Did you remember the up-link?
07 04 29 51  CDR  Okay. In fact, I think it is.
07 04 29 54  LMP  Didn’t like it worth a damn. Okay, Dave. We’ll be done in a minute with this.
07 04 30 06  CDR  Okay, there you go; .2, .2, and .4.
07 04 30 18  LMP  I don’t like tragedy.
07 04 31 48  CDR  Okay, Al. We’re starting them over.
07 04 32 29  LMP  ...
07 04 33 16  CDR  We freaked up at 23: 38 - about 100.
07 04 33 20  LMP  I think we’re ...
07 04 33 34  CDR  We have one mark. Now doing 40.
07 04 33 43  LMP  Make that zero burn at this close mode.
07 04 33 45  CDR  Never touch it. Really?
07 04 33 46  LMP  Yes.
07 04 35 10  LMP  Right on the nominal line, Dave.
07 04 35 12  CDR  Really?
07 04 35 13  LMP  Yes.
07 04 35 24  CDR  Hey!
07 04 37 17  LMP  Watch it. Tail’s going to bump it.
07 04 37 20  CDR  Okay.
07 04 37 23  LMP  Next thing's - no - no ...
07 04 37 31  CDR  Okay. ...
07 04 37 36  LMP  You want to grab this?
07 04 37 37 CDR  We already picked the ...?
07 04 37 39 LMP  If he could talk, you could get him.
07 04 37 42 CDR  State vector agrees with ... I don't know. I think - Let's see what - We might borrow anything off our equipment.
07 04 37 50 LMP  Let's see.
07 04 37 51 CDR  Here's your ... pocket.
07 04 37 58 LMP  Let's see, what - ... I remember, we've got a ... to do.
07 04 38 21 LMP  How you doing over there, Albert?
07 04 38 25 CMP  Doing just fine, but it's back to end-to-end, and I've got much in motion.
07 04 38 30 LMP  Very good. And reading the procedures and checking --
07 04 38 32 CDR  Oh, yes! Bad update! What do you know. I've been looking for it and I finally saw it, but it's not very funny.
07 04 38 41 LMP  Want to check on it?
07 04 38 42 CMP  What'd you see?
07 04 38 43 CDR  That's your tracking light. You're --
07 04 38 45 CMP  Oh, good.
07 04 38 46 CDR  Yes, you're right down the path.
07 04 38 48 CMP  Yes, so are you. Your light is right through the money.
07 04 38 51 CDR  Is it really? Yours - yours is really dim. About like a - maybe a fourth magnitude star? Okay, let's really hit them.
07 04 39 28 LMP  Brighten it up to three.
07 04 39 51 CDR  Okay, there she is. Oop!
Especially about this problem. Make it stick.

Okay. Know what you got to do, Jim?

Yes. I'll take it. I think that's going out there. ... burning.

You guys coming up on final comp.

Okay. We got 20 seconds or so.

Why don't you mark final comp. Get you back with us.

All right, I sure will. 10 seconds. 3, 2, 1 - MARK.

Gotcha.

Okay.

Only 3 seconds difference between us.

Well, it's a 3-second burn, so that makes sense.

No, I don't need it. We have to go to coffee in a minute.

Yes.

Okay, Al. We've got a minus 1.1, 0, and a minus 1.1.

Okay, and I got a plus 1.5, and a minus .2, and plus 1.9.

How about that! That's very nice. Think we'll burn our solution on time. That's - it sort of took an ... 

Okay, go ahead and burn your solution.

All right. We'll burn our solution.

I'll buy that.

Got the AGS and redo solution.
07 04 42 37 CDR All righty. It's reading straight, now.
07 04 43 42 LMP MARK; 1 minute to the midcourse.
07 04 43 46 CMP Roger.
07 04 44 08 LMP Houston's money?
07 04 44 12 CDR Yes, I guess they're using it.
07 04 44 15 LMP Looking forward.
07 04 44 16 CDR Here, you'll like this.
07 04 44 19 LMP ... I want to plop.
07 04 44 47 CDR There you go.
07 04 44 48 LMP ... and the pink ...
07 04 44 51 CMP Can't you get it all?
07 04 44 54 CDR One more cycle now. Okay, we got it all in.
07 04 44 58 CMP Okay.
07 04 44 59 CDR Consider it down there, Jim. It's really 2222s.
07 04 45 18 CMP Oh, you're shining in the sunlight now! Boy, is that pretty!
07 04 45 27 CDR Who's shining in the sunlight?
07 04 45 31 LMP Us, I think.
07 04 46 15 CMP Yes, I can see in the sunlight now, too.
07 04 46 18 LMP Okay. We've got our first mark. We should be up with you.
07 04 46 22 CMP I believe I can even make out the shape.
07 04 46 25 LMP Hey, that's it!
07 04 46 27 CDR No, sure can't.
07 04 46 30 LMP Hey.
07 04 46 34 CDR  It's unreal.
07 04 46 45 LMP  Think you can call another one up?
07 04 46 48 CDR  Hmm! You sure if you got the right thing?
07 04 46 52 LMP  Seems to be ...
07 04 46 57 CDR  Okay. Can't put too much ... Seems to be squared away though, now.

TIME SKIP

07 07 01 09 CC  ...
07 07 01 11 CMP  Houston, 15. Still in the - the midst of doing a little housecleaning.
07 07 06 37 CC  Endeavour, Houston. Would you ask ...
07 07 06 43 CMP  Roger, Houston. Hey, Jim.
07 07 06 55 CMP  Roger, Ed. I was 1 minute late on that - on the mapping camera. We got it started at 1 - at 174:51.
07 07 07 42 CMP  Hey, go to forward OMNI.
07 07 07 45 CDR  Okay.
07 07 08 27 CMP  Houston, 15.
07 07 08 32 CC  ...
07 07 08 33 CMP  Roger, Ed. One other thing: I didn't get the P52 in, either.
07 07 08 40 CC  Roger. Understand ...
07 07 08 42 CMP  Affirm.
07 07 08 49 CC  Al, I'll keep track of your cameras for you ...
07 07 08 54 CMP  Okay. If you would, that would help.

CONFIDENTIAL
15, Houston. Give me REACQ and NARROW, please.
Okay, REACQ and NARROW.
*** the pilot valve - -

TIME SKIP

Cabin reading about 5.7 over there, Dave?
Okay. I guess we ought to wait until we complete chlorination before we get the - -
David.
-- the gloves and helmets off.
Hello, Houston; this is 15.
Baseband.
Yes. Of course.
Mine.
Yes, that's yours.
Let me get that.
Hey, pretty good.
Help me put the other end of this guardrail on here.
MDC guard, Al.
So the MDC guard.
Yes.
Hope it doesn't get over ...
Is it in the way? Huh?
Oh, the MDC guard.
07 14 12 43  CDR  Did you take that down?
07 14 13 40  CMP  Okay.
07 14 33 59  CDR  Got it?
07 14 34 00  CMP  I got it.
07 14 34 08  CDR  Okay, pal.
07 14 34 12  CMP  Come here and - get this.
07 14 37 40  LMP  What time is it?
07 14 37 54  CMP  32:20.
07 14 38 10  LMP  God, 4 hours; that's -
07 14 38 14  CDR  ...
07 14 38 16  CMP  They say go for it.
07 14 38 19  LMP  Yes, just as well. Just fiddling around and getting squared away.
07 14 38 26  CDR  That's right. I guess all I'm saying is the Flight Plan really ought to reflect that.
07 14 39 04  CMP  Yes, they had you learning the ... switch.
07 14 39 21  CDR  Yes.
07 14 39 27  CMP  Okay.
07 14 39 51  CDR  Right there, Jimmy.
07 14 40 11  CDR  Oh, Christ. I'm putting it all over your face here.
07 14 40 28  LMP  Want to use some of your soap?
07 14 40 54  CMP  Hey, you're supposed to be somehow nonaffected by the CMP.
07 14 42 28  CMP  Okay, Dick [sic].
07 14 42 41  LMP  Shit.
Oh, yes, 7 hours left of my 9-hour rest period.

Well, we -

Not interested in what he's doing. You'd like that more than this.

Huh?

Your urine bag? Oh, no, I got them all cleaned out so -

Yes. I've cleaned mine.

Oh! Poor ... I've been - I tell you, I've been rinsing everything out with water every time I pee and every time I go to sleep.

Is that a fact?
08 01 51 13  CMP  Houston, 15. Houston, 15.
08 01 51 15  CC  Go ahead.
08 01 51 19  CMP  Okay, Joe. I got the gyro torquing angles up, and I'll torque them out in a minute.
08 01 51 26  CC  Standing by.
08 01 53 17  LMP  I'll get out of your way, Al, so you can get down in here.
08 01 53 33  CMP  Okay.
08 01 53 38  CC  Al, we've noted the termination of your fuel cell 3 purge. At your convenience, open the X-ray and the alpha particle experiment covers, please, and turn the alpha particle back on. Over.
08 01 53 51  LMP  Okay, Joe, we'll be about another 2 or 3 minutes finishing up all the dumps, and then we'll do that.
08 01 53 59  CC  Okay. Fine. We do want you to wait until all the dumps are completed, and then open the doors and turn alpha particle on at your convenience, really.
08 01 54 10  LMP  Roger.
08 01 54 17  CDR  ... this morning.
08 01 54 19  LMP  Yes, Myrtle. I didn't use - I didn't - hadn't used Myrtle this morning. I didn't use Myrtle this morning.
08 01 54 25  CDR  I think that checklist is ... 5 minutes and then closed.
08 01 54 29  LMP  Yes, it does.
08 01 54 30  CDR  Yes, that's ... Yes. Yes. ...
08 01 54 36  LMP  Yes. Yes. I didn't use that this morning.
08 01 54 40  CDR  ... Al. ...

CONFIDENTIAL
08 01 54 50 LMP That's true.
08 01 54 51 CDR ...
08 01 54 56 LMP Yes. You were smart.
08 01 55 19 CC Good Ship Endeavour, this is Houston. We'll see you on the other side.
08 01 55 23 CMP Okay, Joe.
08 01 55 43 LMP Okay, we got --
08 01 55 44 CDR We stow this in that jum [?] bag down there? When I took that ..., Al? Okay.
08 01 56 28 LMP How about this? Go MANUAL and WIDE. Right, Al? That what you say? Then - then go to REACQ? Just leave it in MANUAL and WIDE until we come around, right?
08 01 56 41 CMP What?
08 01 56 42 LMP MANUAL and WIDE. How about the SQUELCH ENABLE?
08 01 56 56 LMP I have the SQUELCH ENABLE on.
08 01 59 17 LMP I'll get it. This is ...
08 02 00 04 CMP Okay.
08 02 00 20 LMP Okay, all ... be done behind here.
08 02 01 02 CDR You want to - I don't care. Where is the best place for you to be?
08 02 01 08 CMP Here ...
08 02 01 09 CDR Okay. I'll just stay here in the center.
08 02 01 20 CMP ...
08 02 01 22 CDR I know. You ... put mine on.
08 02 01 25 CMP ... launch.
We might have them sorted out by then.

Old Al, he's a gentleman ...

No, don't bruise him.

Yes?

... read that ... now?

... Magic Marker ... Besides, these used to be the guys ... all versions ... all the cross-subjects of the command module. Although ... all the stuff ...

... a lot of garbage. ...

..., Jim. ... all garbage ...

Yes. ... put the garbage in here all ...

I don't --

We do? Shoot, I - I feel great today.

... gone from one ... to the two.

What do I have to do?

Photograph that ...

Oh, yes.

I should have brought that LEC hook back. It sure was handy in the LM. Trying to grab stuff with the EV gloves was like work.

... 5 minutes ... did you get them - did you get them back ...

You know, Dave, we had probably - we had the worst condition possible for getting up and down that front ladders. That's the problem --

... For getting up and down that front ladders. The gear hadn't stroked at all. And it was, you know, practically off the surface. If I didn't have
anything, if I could give a good leap, I could make it to the first rung. Most times, while carrying something, I ended pulling myself up with my arms to get to the first rung.

08 02 06 15 CMP ... the gear didn't stroke ... - -
08 02 06 16 LMP Didn't stroke at all. In fact, the front pad wasn't even on the surface. No, the pad was loose --
08 02 06 24 CMP Yes.
08 02 06 25 LMP -- free to rotate, so it wasn't even - it wasn't making a firm contact at all with the surface.
08 02 06 36 CDR ... sticking to the bottom, to me. I'll tell you, Jim, it sure is a lot easier than that damn ...
08 02 06 45 LMP Oh, yes, particularly, you know, if there is a little time. I - I could transfer the bags up and just leave them on the porch, wait for you to get up there, and you pass them, then I could grab them with that LEC hook.
08 02 06 55 CDR ... in three times to try it. ... once to transfer the LEC ...
08 02 07 02 LMP Yes.
08 02 07 48 CMP Try your scissors. You ... Your scissors are over there, on your left of your - O2 FLOW HI. Help me dump it.
08 02 08 07 CDR Oh, shit! ... ketchup ...
08 02 08 13 LMP Here's some, Dave. Right here.
08 02 08 15 CDR Okay. Now ...
08 02 08 36 LMP Want some more?
08 02 08 39 CDR ...
08 02 09 20 CDR ...
08 02 09 42 LMF Cabin pressure's are ...
Cabin pressure's are what?
Split at 5.
What? This vent is open ...
Myrtle was ... and the ... valve was just open ...
back up.
... your burn's out if you leave your flow valve
in normal? ...
Jim, I think this little valve in your jiminy [?] bag is all clogged up. That's your problem. Because I just tried that, and it works fine - transferred to a new jiminy [?] bag. ... valve.
Yes; I think my valve is probably a little clogged.
Well, you got to keep it clean.
Yes.
... I don't think any ... in there.
Anyone for chewing gum this morning?
Want some chewing gum, Dave?
What?
Want any chewing gum?
... Do you have all the parts there, Al?
They're in here if you need them. ...
Good.
They go on here ... Take a whole piece.
... stuff like that.

Watch it. This washer over here slipped.

If you had a screwdriver, I think we could push the washer on this side down a little bit, Al. This washer here's slipped up.

Okay. I've got it through now.

You've got it a little apart.

Where is the other part? I got it through the washers. Go ahead. ... be tighter than that.

Man!

I don't see it. Okay. Tightened it up to some extent ... this screwdriver. Why don't we try them out.

Tool E fit in this socket over here? It's too big?

Yes?

... 

Okay, I think we got it. O₂ FLOW HI again.

I think you almost got it. You want me to try it ...

Better put some chewing gum on it; maybe some tape. That's what we need. Put some tape around it. That will keep it from backing off.

Guess we ought to check those screens on the - on the hoses, too; they're probably - should be changed this morning.

... get the vacuum cleaner, pull all the filters out, and we'll ... --

Okay.
--- Get the vacuum cleaner off, lay down every bag and everything before we leave. shoes stow away. In the mean time, I'll go around and get it all the little bags we have and all the goodies from the LM, put them in that one camera bag bag, and And check. It would be nice to log all before we start taking ---

08 02 22 26 LMP Yes.
08 02 22 27 CDR --- Exactly what we're ...
08 02 22 30 LMP Yes, okay. Okay, Dave. If you hand me the tape. I think this is about as tight as we'll get this.
08 02 22 42 CDR I can't hear you.
08 02 22 43 LMP Little pieces of tape.
08 02 22 44 CDR Tape?
08 02 22 45 LMP Yes.
08 02 22 59 CDR How big?
08 02 23 01 LMP Oh, probably - 6 inches worth. Yes.
08 02 23 13 LMP Yes.
08 02 23 27 LMP Dave Scott taught me. Tape everything. Yes, I don't know what we would have done if we hadn't had the tape along. I might have been without comm on the surface.
08 02 23 53 CMP Okay, I think your seat's fixed.
08 02 25 17 LMP You know what we can also do, Dave, is wet wipe the MAGs. Might be even better than - wet wipe them - get a towel - damp towel here - just wipe them off.
08 02 25 27 CDR MAGs?
08 02 25 28 LMP Yes, rather than vacuuming.
08 02 25 29 LMP No vacuum ... wet wipe ... towel ...
Procedure says to unstow them, vacuum, and then wet wipe. Yes.

Yes, I was just going ... LM Timeline.

I think I would follow the ...

Yes.

You know why I vacuum ...

Okay.

Can't we use this little square?

Yes. Yes.

Make sure you ...

Use those little square jobbies, you mean - we have around. Yes.

And I think vacuuming would be easier to get in the cracks. And I certainly think that dirt will - dirt can get in the cracks ... Maybe wipe the surface clean. ... Okay. ...

Yes. Okay.

You don't have another bag we can put this - this trash in?

I was wondering if we had another big feed bag that was just about empty - the food locker, we could put this in there. Better than making two transfers.
Well, where's the JETT bag? Let's put it in the JETT bag.

We can't use the JETT bag. If we do that you've got to get the ...

Okay, okay.

Get your own C ...

Okay.

We don't put up with it.

Do you want to take this down with you? Just transfer all the stuff up - out of that bag and into this one here, Al.

Yes.

... We got JETT bag in 3 - 310B ... Turn around and look ...

... 

No, that's ... canister.

Hey, I got a mapping camera pad ...

Yes.

...?

Which one do you want to get in? This one? Okay.

I'll just unplug here.

...

What?

I got the LM Timeline ...

Yes, I have.
08 02 33 57  CDR  ... 
08 02 34 09  CDR  Yes.
08 02 34 10  LMP  ... cooled things off, too, huh?  Beat his ass, too.
08 02 34 15  CDR  No, I ...
08 02 34 18  LMP  Oh, I don't know.
08 02 34 20  CDR  No, I ... something.
08 02 37 21  CDR  Daylight.  Oh, okay.  Sure will.  ...
08 02 37 35  CMP  ...
08 02 38 41  CDR  You know, I figure we got almost exactly a 100 hours.  As a matter of fact, this ent - this orbit entry, or - entry interface, is at - 291:30 - huh - 294:43.  It is now 194 and some.
08 02 39 25  LMP  Not as bad as ...

TIME SKIP

08 03 51 15  LMP  Roger.
08 03 51 16  CDR  Roger.  Let's go back to POO.
08 03 51 19  LMP  Mine, too.  Is mine in work?
08 03 51 22  CDR  No (laughter).  I got mine.
08 03 51 26  LMP  Yes.
08 03 51 27  CMP  ... went that-a-way, huh?  Okay.  I got tape motion going, so I guess we might as well -
08 03 51 42  LMP  We don't need those guys.
08 03 51 50  CDR  Oh - beautiful.  Fine.
08 03 51 58  CMP  ... your private beverage.
Okay, Joe. And we're just sitting here in attitude all set to dim the lights and do the gegenschein.

(Laughter) Certainly, Joe (laughter).

"Anything you need, give us a call."

(Laughter) Just like we're assigned right behind ...

Better check our camera time here.

153 even is where the Flight Plan calls us.

Go ahead.

Okay, in 1 minute, Al.

Yes. What frame time?

One frame, the whole minute.

Yes.

Ten seconds.

One in each hand. ... look all right? Okay?

Looks like we're 1 minute and 18 seconds down in the Flight Plan.

Bravo. I want to go get a star mark.

Okay.

Hey. Got coffee?

Yes.

Yes. ...

Okay, Jim, if you'll give us FREE.

And turn the lights off down there.

Can't get used to it. We're getting free light out there.
08 03 56 04 CMP  Yes, that's some stuff, ain't it?
08 03 56 06 CDR  That's really bright.
08 03 56 22 CMP  Now we're trying the gegenschein, the midway point, and the Moulton point. But we got to do an attitude maneuver here in just a minute. In fact, in 3 minutes from now, to be precise, since we're getting a 3-minute exposure.
08 03 56 52 CMP  Yes, we're all right for that.
08 03 57 03 CMP  Here.
08 03 57 05 CDR  That's - that's in some bunch of ... anyway.
08 03 57 17 CDR  Well, you see the gegenschein?
08 03 57 21 CMP  Well, it should be straight ahead of us, Dave.
08 03 57 30 CDR  ...
08 03 57 36 CMP  No.
08 03 57 54 CDR  Well, I'm not sure. I think we ought to get ... I - I - Why don't you look - I think it would be -
08 03 58 00 CMP  No. If there is such a thing, there's a - there's a very definite branch off from the Milky Way. Floating almost to big B. Well, it's not long.
08 03 58 19 CDR  No - no, the big hairy one.
08 03 58 28 CMP  Yes, that's right. No, it's - it's a localized area, you know. But it would probably be in the shape of an oval. Well, anyway, that's the only thing - that's the only thing that came close to that, was that thing that looked like a branch off the Milky Way. Double or nothing.
08 03 59 34 CMP  Okay, turn the lights up there, Jim.
08 03 59 54 CMP  No. Okay, go to CMC, AUTO. Okay, now we want to maneuver to another point there: Midpoint attitude, Flight Plan.
08 04 00 05 LMP  Midpoint. I understand.
Okay, plus .6900.

Let's see.

5100? And minus 021.

No, 261.

Yes. Okay.

... 

It's - it's in the ...

Oh, Jesus!

...

Shouldn't laugh at me.

Give him my regards.

Now break down a little bit. Look, he'll stay crazy if you're acting crazy. Look, Al, he doesn't understand.

We're down in the time line. Getting slightly green, Jimmy, my boy?

No.

I got to get it into AUTO.

... getting ...?

Christ!

Yes, I know.

Now let the rate damp there for a second; hope it improves.

Okay, you're not losing face.

Yes. Right. Okay.

As I was saying -
Ah, go to hell, MDC.

What's that time on the other one? Time on the DSKY?

Mm-hmm. Yes, I used them, too.

What elevation? Yes.

Yes, there's quite a few stars out there, aren't there?

Christ! ... given you?

A little darker now. Let's see. There's my star right up over there. Yes, that's -

... 

Damn! You always seem to take it bad when you do an alinement.

Well, you can't be all crude and all. But that little - that - that little - that thing there is something. Might be another planet.

Why don't you ...?

Yes. Yes.

Yes.

... 

Yes, trying to move ... We've got another 5 minutes to go. Anyway, we've used -

Okay. Okay, Jim, lights up.

And we got a P20 coming then.
08 04 09 19 CDR Yes, CMC, AUTO. And this time we want maneuver to -
08 04 09 38 CMP Yes. We have ...
08 04 09 46 CDR We haven't ...
08 04 09 54 LMP ...
08 04 09 57 CMP Well, got the housekeeping done.
08 04 10 02 CDR We're not going to have a ...
08 04 10 09 LMP That's a shame. ...
08 04 10 25 CMP I can't find --
08 04 10 26 CDR Turn the lights down and look for a few minutes, if you want.
08 04 10 29 CMP We don't have to stop for another 10 minutes yet.
08 04 10 33 CDR So you can go to ATTITUDE HOLD there, Jim.
08 04 10 36 CMP Or go to CMC, AUTO.
08 04 10 48 CMP Got it. Turn it down. Turn that damn thing down.
08 04 11 37 CMP ...
08 04 11 39 LMP I want to look for a few minutes.
08 04 11 56 LMP God damn. Is it in there?
08 04 11 59 CMP You can see something bright down in there.
08 04 12 27 LMP Al, could you move it?
08 04 12 29 CMP No, it's ...
08 04 12 50 CMP Yes.
08 04 12 59 CDR ...
08 04 13 05 LMP No, can't see. I just can't see. ... lights wouldn't come down. It's a function of lighting.
08 04 13 22 CMP No. ... got ... something else.
No, I really can't see anything, Dave. ...
Oh, shit. You're too easily impressed.
No one thinks like me.
Yes. As a matter of fact, that's what I keep saying.
Freak you.
That's not nice.
See if I can see that.
Oh, let me see. That's - that's too hard to see.
Okay.

... They're not - they're not as bright as I thought they'd be, either.
They're not?
Is that right?
Yes. They're not - they're not much brighter than they are on Earth. Okay, lights up. Camera's off?
No, the guy wants that - business here. Yes.
Okay, Dave, will you put these back in B-2 for me, please?
Jim? Is that breaker off?
Yes, might as well call.
All right. I want to move these before I - ... Ow!
All right.
Too early.
...
08 04 17 45 CMP ...  
08 04 20 33 CMP Yes.  
08 04 20 45 CMP Huh? Yes. Yes, I'm a person. Right here, Jim.  
08 04 20 51 CDR ...  
08 04 20 52 CMP Well, put the TV back in -  
08 04 20 56 CDR If you will, snap that one.  
08 04 20 58 CMP It kind of gets in the way of everything else. Let me stick it down here for now.  
08 04 21 08 LMP Sure is fun with lots of people.  
08 04 21 12 CMP Stow them.  
08 04 21 54 CDR Put that one down here with mine.  
08 04 22 11 CDR What's that, Jim?  
08 04 22 13 LMP No!  
08 04 22 14 CMP Good. Very good.  
08 04 22 17 CDR Okay?  
08 04 22 18 CMP Yes. You got to - yes. We've already signed those, haven't we? We haven't signed these? It really doesn't make much difference, does it?  
08 04 22 26 CDR No.  
08 04 22 27 CMP We don't really have to sign them now I guess. We can do that anytime.  
08 04 23 10 CMP Yes, those - those covers would have been infinitely more valuable, I think.  
08 04 23 17 CDR Oh, well.  
08 04 23 21 CMP Maybe, Dave, it's just as well we didn't.  
08 04 23 27 LMP Okay.
08 04 23 30  CMP  Bastard.
08 04 23 35  CDR  ...
08 04 24 49  CDR  I've got one. Come down.
08 04 24 51  CMP  God damn. Is it - is it in there?
08 04 24 56  CDR  Oh, I've only been changing the film; one in the LM and one in there. Come on down.
08 04 25 02  CMP  I'm going to have to go all the way back to the Moon to come on some of that.
08 04 25 06  CDR  (Laughter)
08 04 26 13  CDR  ...
08 04 26 21  CMP  Yes, very good. ... that move.
08 04 26 30  CDR  ...
08 04 26 31  CMP  Yes.
08 04 26 32  CDR  What? No more film.
08 04 26 36  CMP  What?
08 04 26 37  CDR  ... I need more film ... camera ...
08 04 26 39  CMP  Can you change it?
08 04 26 42  CDR  ...
08 04 26 45  CMP  Yes, but you know the way he is.
08 04 26 49  LMP  Feel around here.
08 04 26 50  CMP  Yes, sir.
08 04 26 57  CDR  ...
08 04 27 04  CMP  Oh, no. But I don't think you are. ...
08 04 27 10  LMP  That's the reason. Yes, yes, yes.
08 04 27 20  CDR  ...

CONFIDENTIAL
That doesn't take very long.

Where you going?

This guy's got more pens somewhere, because I need one to keep track of the Flight Plan, too.

Here's one.

..., Al.

I got one.

Excuse me, Jim.

Excuse me.

Sure can.

...

Yes. I got one. Yes.

... solution in color ...

You got a MAG that hasn't been used at all?

...

Huh? Just as - it may be just as well. Tell me we don't have any.

We don't - we don't have any of that left.

Hey, gang, they don't have another eat period for 6 hours.

What?

There's not another eat period in the Flight Plan for 6 hours.

Six more hours? Jesus Christ!

That's right. And that's just before our sleepy time.
Six hours to bed.

Yes. I don't think we need the Contingency anymore. We don't need that one. Or these. Or these.

Can I get that map you got over there?

Okay. Yes, got -

Two of them here. Have three.

Okay, David.

Most of these don't.

Yes. Got two fresh maps here. One's labeled CMP and the other is labeled nothing.

Well, we missed some spectacular terminator photos. Damn. You know, I was wondering. You want to get the terminator photos if still possible. That would have really been spectacular.

Well, yes. The terminator's on the Flight Plan.

Yes.

Well, if we've got the film, by golly, I'd like to take a lot of terminator photos.

Yes.

No, that'd really be neat; take a bunch of terminators. And the setting should be the same regardless of where the terminator went.

...
Do you know how to change the settings from 250 to 500?

No, I mean - I mean what the comparable settings are. Like f/5, 1/50th and all that.

Terminator photos for the 250, they call out f/5.6 and 1/125th. And that's for the very-high-speed black and white. Yes. You don't have any left though, do you? No. Yes.

No. No, that's not fast enough. That's all right. Listen, I got lots of brand R left. Use it.

Yes. It's sure would be nice to get a - some pictures down into the bottom of ... bottom. ...

Oh, deary.

The old Earth is real impressing down there. ... get some.

Oh, boy! God, I guess. That thing was huge.

Never did, huh?

... Never mind.
Well, we ought to be able to tell in an hour.
Okay.
The what? Oh, yes. Okay?
...
We are, Jim. I got it hot for you. Don't worry, pal, we won't forget you.
I'll bet you ...
No. I think he's right here.
... sex?
Neuter? Okay, that spaghetti is mine. Hamburger wet pack. Pea soup, ham and salad, applesauce, cheese crackers. Brack!
Blach! Does it look like it, Jim?
Yes.
You say it looks like it, Jim?
No.
You got eyes, they're almost 20 - 20, so - (laughter) Okay, it's a -
I think it's time to raid you. I want to make sure they get it all down - down on the - on the file there.
Very good.
What?
That one's for you. Here. Have at it. ... turn around ...
... here.
Well, I think I'd -- stick it under the couch there. That's where I kept it before. But, of course -- Huh?


Okay, Jimmy, you got 8 minutes to go.

Hey, listen. You -- you -- you're bugging me a little bit. If you're going -- if you're going to exercise, you ought to at least have the decency to put your biomed on (laughter). There's no sense wasting all that on us. Let the doc see it.

Ooh, applesauce. Their applesauce is good stuff.

You have Cannon towels, no doubt.

I think I've been holding this many of them before.

Oh, yes. Yes, we were in darkness about the time ... We'll be on the dark side for about 20 minutes now.

Two minutes to go, Jim.

Hey, Jim.

Okay, Jim.

... regular ... heartbeat.

Huh? Yes. After -- after awhile it gets to be working, moving your legs around again, you know?
08 06 01 53  CDR  ... boy, oh boy.
08 06 02 38  CDR  How do you mean?
08 06 02 48  CMP  No?
08 06 02 53  CDR  Oh, my eyes - my eyes were playing funny tricks on me for a while. ...?
08 06 02 58  CMP  So am I. Yes.
08 06 03 01  CDR  I'll think I'll see a - yes. Yes.
08 06 03 09  LMP  Oh, yes, I seem to be getting them.
08 06 03 17  CDR  Well, that's like a ...
08 06 03 19  LMP  Too early.
08 06 03 22  CDR  No. My brain is seeing them when you're not.
08 06 03 35  CMP  Hey, Dave, you any good at putting hot water in?
08 06 03 38  CDR  Oh, God, yes. Let's - Okay.
08 06 03 42  CMP  How about doing some pea soup for me when you get around to it?
08 06 03 45  CDR  Huh? Where's your spoon, Jimmy?
08 06 03 56  CMP  Is it in here?
08 06 04 12  CMP  ... Jimmy's spoon.
08 06 04 19  LMP  It's in the - oh, okay. ...
08 06 04 32  CMP  You mean like these?
08 06 04 45  CMP  What spoon?
08 06 04 49  CDR  How many?
08 06 04 59  CMP  Oh! Gee, what'd I do? Try to get rid of them?
08 06 05 46  CDR  What?
08 06 05 55  LMP  You're getting ... for a ...
08 06 05 57 CMP Yes.
08 06 06 02 CDR ...
08 06 06 35 CDR ... (Clears throat)
08 06 06 46 CMP Yes.
08 06 06 50 LMP ...
08 06 06 53 CMP Watch it. He'll be bitching about that.
08 06 07 42 LMP ...
08 06 07 45 CMP Yes.
08 06 07 50 LMP Give it to Al.
08 06 07 57 CMP Give me the little white tool.
08 06 08 17 CMP Thank you, Dave.
08 06 09 15 CMP ... got in the way here.
08 06 09 18 LMP ...
08 06 09 21 CMP Yes. It really is. Yes. I wish you guys would go somewhere.
08 06 09 45 LMP ...
08 06 09 47 CMP Because he doesn't want the gray to show.
08 06 09 50 LMP ...
08 06 09 51 CMP (Laughter) He'd be perfectly happy if we had pens instead of erasers.
08 06 10 15 CMP (Laughter)
08 06 10 49 LMP ...
08 06 11 22 CDR Hey, how about exporting it?
08 06 11 34 CDR ... Yes. ...
08 06 12 20 CMP ...
08 06 12 43  CDR  You guys ...?
08 06 13 15  LMP  ...
08 06 20 30  CDR  ...
08 06 20 35  CMP  ..., Dave.
08 06 20 37  CDR  Where? I don't see ...  Huh?
08 06 20 44  CMP  Right there.
08 06 20 46  CDR  ...
08 06 21 07  CDR  Yes. I can see ...
08 06 21 10  CMP  (Laughter)
08 06 33 34  CDR  Don't forget, we got ...
08 06 33 37  CMP  Yes.
08 06 35 50  LMP  What a sport.
08 06 36 06  LMP  What a sport!
08 06 36 08  CMP  ...
08 06 36 09  LMP  You are.
08 06 36 11  CMP  (Laughter) Yes. Yes.
08 06 36 29  LMP  Enough!
08 06 36 32  CMP  Yes.
08 06 36 33  CDR  Enough's enough. ...
08 06 36 39  LMP  Yes.
08 06 36 41  CDR  ... --

TIME SKIP

08 09 46 10  CDR  Boy, that's ...
We didn't put it in my safe place.

Are you at P51?

I'm not there yet. See, I cleaned that thing religiously, all - every night?

No --

But we didn't --

But - but we didn't get it last night, I don't think.

No, it's all that crap we brought in here.

Yes. Yes. Yes. Feel the difference already in air that's blowing out of the hose. It really does make a difference. Yes.

I thought it was practically suffocating.

Probably that, and the combination of going in dark.

Oh, gosh. They're sitting there in their own comfortable console.

...

...

Yes, that's right. Go ahead.

All righty. Thank you, sir, and we'll see if we can conjure one up for you.

...? Yes, I need to get him a status of the command module. Joe - we'll give it to him when we come around next time.

That's the stuff ...

You tell me when - You tell me when ... that flight data ...
What's you doing? What's you doing? Throwing away dirty stuff? ...

... 

... - You didn't put on clean tonight, did you?

Oh. Your last one? Guess you got stuck with it, Jim. ...

(Laughter) I've got a little job for you to do, Jim. Assemble camera, lens, mirror, and magazine on special window-5 bracket; rotate the lens 180, so we can take pictures of the mass spec. You do that in - about 15, 20 minutes. Well, we use the - we use the 16 millimeter. And the bracket's down in A-8. You know, that big bracket down there. You do that while I'm -

I don't see it.

-- while I'm doing a P52. Oops! Excuse me, Dave. ...

Yes, I know. God dang, it's not very crowded down here!

Hey, you got to this ...

Okay. We'll - we'll get it. I'll get it. Keep going. I'll get it.

I used to do it by myself. No big deal.

Okay, as long as you're in the couch, how about putting me in FREE? MODE to FREE.

Okay.

Star 1.

Star 40.
Where?
Out there.
Wooo!
...
Huh?
...
Let's see. ... 202:00:30.
Jim wants to know if his camera ... on the mass spec stuff.
Jim, you want to get the - the mass spec boom and gamma ray boom on their way out now? Might as well go ahead and do that.
MASS SPEC BOOM, DEPLOY. ... find it?
No, just get it out.
Do you want to --
We got time for it.
-- ...
Yes. Okay, mass spec boom photography, 16 millimeter - MAG L. What MAG's on there? E is on there now?
...
Here, you've got to put this UV thing in the window, too.
I'll have to go back.
Okay. I took all this - extra film and ...
... You got plenty of places in here, right?
Yes.

... remember ...

Okay.

You'll never get it all used up if you ...

That's right. We'll never have time to use it all.

... Yes. Is there any further use for the vacuum cleaner and all this --

... -- stuff hanging around here?

... Put the bag and brush in ...

Okay.

...

Yes.

...

You've got to use it for ...

What have you got in there now?

Where did you --

...

-- where'd you leave the filter and all that stuff?

...

Okay. Might as well leave it all there, huh?

I think before activities get too far away, I will take a crap.

Is that so?
08 10 06 25 CMP  Yes. Jim, will you unplug me, please? You guys got the comm.

08 10 06 29 LMP  ...?

08 10 06 30 CMP  Yes.

TIME SKIP

08 19 49 57 LMP  Trade you for your cocoa.

08 19 50 17 CDR  35, 45.

08 19 51 23 CDR  Okay. Okay?

08 19 51 33 CDR  ... Right? ... 3.

08 19 51 51 LMP  Here you go, Al. There. Okay. Good.

08 19 52 23 LMP  Here's your bag, Al. Give me your juice, then, Al. I'll take the juice.

08 19 52 58 CDR  I think I'll ... Okay. ... eggs ...

We have sausage and eggs. How about sausage this morning.

08 19 53 20 LMP  ...  

08 19 53 25 LMP  Sausage this morning.

08 19 53 27 CDR  Scrambled eggs and sausage? That'd be good.

08 19 53 29 LMP  That'd be good. Yes.

08 19 53 48 CDR  ...

08 19 54 14 LMP  Our favorite compartment.

08 19 54 43 CDR  ... sleep, Jim?

08 19 54 45 LMP  Pretty good. I just woke up once.

08 19 55 54 SC  (Humming)
08 19 56 18 CDR ... down there. ...
08 19 57 03 LMP Want me to try to put that separator on the -
        dispenser down here, Dave?
08 19 57 09 CDR Well, we haven't got any ...
08 19 57 21 LMP That's probably why we're farting so much.
08 19 57 23 CDR What'd you say?
08 19 57 24 LMP Probably why we're farting so much up here.
08 19 57 27 CDR Yes, I didn't put --
08 19 57 28 LMP All smells like hydrogen, really.
08 19 57 30 CDR -- ... 
08 19 57 31 LMP Check it here.
08 19 57 32 CDR ... What's that number.
08 19 58 58 LMP Okay, Dave. Here's that other cocoa.
08 19 59 10 CDR ...
08 19 59 12 LMP Too late now. Don't be an Indian giver.
08 20 01 08 LMP If you have something there to go in the hot water,
        Dave, I'll stick them on for you.
08 20 01 15 CDR Yes, I got ...
08 20 01 26 LMP What do you want, Dave?
08 20 01 28 CDR Oh, that's all right. What do you have?
08 20 01 32 LMP Okay, I'll see what I can dig up out here.
08 20 01 34 CDR ... 
08 20 01 35 LMP No -- 
08 20 01 36 CDR ...
08 20 01 38 LMP Be easier since I'm here.
Can you bring this back a little, Al? Will that go back?

Yes.

Anybody want any fruit? Lot of apricots and peaches.

..., Jim?

Yes.

How about some bacon squares?

...?

Coffee.

Yes. Stick it on there. Did you tighten down on it?

...

Is it tightened down?

Turn around.

...

... Jim ...

Very simple.

Ready? You really have to push it on there.

...

Is it up all the way? Yes - you - you have to push pretty hard to get it on there.

Think it ...

I don't know ...

I don't know. Something coming out of there?

Yes, it's coming out there, but - looks like there's a lot of water collecting at the end of the separator. No, I just - it's got a pool there at the end.
In fact, it looks like it's leaking. It is leaking. It's leaking, Dave.

I guess it's just... water...

Went to bed at 9. Got up at 4.

Got up at 4!

Seven hours.

When are we going to listen to music? Were you listening to - your recorder last night, Dave?

Say what?

Were you listening to your recorder last night?

Did - didn't you have some music on last night? I'd swear I heard music just before I went to sleep.

Put me to sleep anyway.

(Laughter)

Want me to put some hot water in those eggs, Dave?
08 20 21 13 CDR ... 
08 20 21 15 LMP About ready to go again. 
08 20 21 31 CDR ... 
08 20 21 32 LMP Yes. 
08 20 22 21 CDR ... 
08 20 22 23 LMP Yes. 
08 20 22 24 CDR ... 
08 20 22 26 LMP Yes. 
08 20 22 27 CDR ... 
08 20 22 40 LMP Okay. 
08 20 22 57 LMP Want some more? 
08 20 22 58 CDR Yes. Sure. ... 
08 20 28 05 CC Apollo 15, this is Houston. How do you read? 
08 20 28 11 CDR Hi, Houston; 15. Loud and clear. How - us? 
08 20 28 17 CC Hi, Dave. You're coming through loud and clear. How did our consumables update get to you? Okay? 
08 20 28 25 CDR Yes, we got normal ... Okay. We got everything but the oxygen. 
08 20 28 34 CC Okay. Want me to read those three up? 
08 20 28 43 CDR Okay. Go ahead. 
08 20 28 51 CC Roger. Oxygen tanks at that same time that I gave you originally were 61, 64, 48. 
08 20 29 09 CDR Okay. 61, 64, and 48. And I have a P52 for you and a crew status report. 
08 20 29 20 CC Fire away with them.
Okay. The P52: NOUN 05 was .01; NOUN 93 was plus .029, minus .025, plus .018; it was torqued out at 211:52:00.

And if you still have your pencil handy, why, the sleep came out to 7, 7 and a quarter, and 7. And the PRDs: 25026, 23182, and 08033. And go ahead with your updates.

Roger. Okay, Flight Plan updates for the coming rev and - There's several of them here. And just to keep you feeling a little bit more optimistic, on the following revs, there are very few updates. Okay. At 212:40, we want to delete MAP CAMERA IMAGE MOTION, INCREASE.

Roger. Got the deletion at 212:40. Go.

At 2 - Roger. At 213 plus 24, we want to delete the GAMMA RAY BOOM, DEPLOY.

Marking DEPLOY.

And at that - there are three - Roger. And just below that, the MSFN verify len - lens tuck in and also the PAN CAMERA POWER, OFF; delete both of those.

Roger. Copy the next two deletions also. Go.

At 214 plus 02. We want to change that camera configuration to the 250-millimeter lens, 250. The f-stop should be 5.6; the exposure time should be 1 over 125.

Roger. 214:02. Camera configuration: 250 millimeter lens, f/5.6 ...

Correct. --

TIME SKIP

...
08 23 35 27 CMP What?
08 23 35 28 LMP ...
08 23 35 30 CMP Yes, he'll ... Follow those numbers. As long as we're in FREE, it don't really make any difference whether you got P30 running or not, as far as P20 is concerned. Anyway, they don't care about it as long as we don't run it more than a half an hour.
08 23 36 43 CMP No, he wanted to run the P20 through.
08 23 36 46 CDR ...
08 23 36 49 CMP Yes.
08 23 36 50 SC ...
08 23 36 51 CMP You want to do a P20 first.
08 23 36 52 SC ...
08 23 36 54 CMP Yes, you don't need to do that until - They - they need to have us inertial for a while. Yes. We do that calibration in this attitude. And then at ...
08 23 37 07 LMP ...
08 23 37 08 CMP Yes. At 55, then we can go ahead and do a P20, and - and get into attitude and then do the P30.
08 23 37 22 LMP (Yawn) ... time for ...?
08 23 37 27 CMP Hey; you know, it is. What time is that thing happening? Not for a while yet, I bet.
08 23 37 45 CMP ... another 3 and a half hours.
08 23 40 27 CMP Yes, ...
08 23 40 33 LMP ... What ... do? Let's see ... We're ... that bag ... Put them away - ...
08 23 40 57 CDR Stand by and ... Come on. ... LOGIC ...
08 23 41 02 LMP 8700? The rest of them ...
08 23 41 08 CDR ... still too ...
08 23 41 11 LMP Yes, I know.
08 23 41 13 CDR Got to ... these goddam ...
08 23 41 18 LMP ...
08 23 41 22 CDR ... this ...?
08 23 41 23 LMP ...
08 23 41 28 CMP Yes, it's not much of a lineup - from a ...
08 23 41 38 CDR ...
08 23 41 41 LMP ... What are you trying to do? ...
08 23 41 53 CDR Well, if you want to get - well, what I really want to do is make sure we got helmets and gloves ...
Be right back.
08 23 42 00 LMP Where you going?
08 23 42 01 CDR I got to put your - I got to put my helmet ... my EV gloves. The rest of your helmet, Jim, will go with my helmet and your ...
08 23 42 21 LMP Yes, put them down there. ...
08 23 42 32 CDR ... out?
08 23 42 33 LMP ... umbilical and ...
08 23 42 44 CDR ... going to do it just like you used to do it with a checklist back when ...
08 23 42 49 CMP Try to find that checklist ... It's part of the requirement. ... do. You're going to have to punch all these goddam switches, pardner.
08 23 42 59 LMP ... for the ... switches, let me know.
08 23 43 16 CMP Who doesn't?
08 23 43 19 CDR ...
Just have to see.

We'll have to stow this stuff for TEI. ... umbilical. All this stuff for the EVA configuration, ... really ... trouble.

... --

Well, we are going to have to photograph the EVA, too. (Cleared throat)

I know that.

Okay.

..., too. ...

Yes.

We better not use - use your attitude. ... The rates are low. ... I think once we get ...; otherwise, maybe we could arrange a TEI ... (Laughter)

Yes.

Well, TEI, all we really need to do is ...

Sounds like you're trying to get out of EVA ... Tomorrow, ... take a little --

Yes.

-- reshuffling. So, if you can go now, ... some reasonable point ... EVA prep. We can try it, anyhow; because tomorrow, when I'm trying to get things squared away for the EVA prep, by the time we can ... the EVA prepping ... It'll be late tomorrow before we even ...

Yes. We can get all that stuff done ...

Yes.

Got lots of stuff to be ...

... for these? Oh! ...
... Yes. Well, we can't really use those on this EVA. ...
08 23 46 30 LMP Yes.
08 23 46 34 CMP Watch it now. ... coming up ...
08 23 46 40 CDR ... Where will we have to go with - Well, let's put it in this ...
08 23 46 48 CMP It's getting ...
08 23 47 02 CDR ...
08 23 47 04 LMP What?
08 23 47 05 CDR I said, "Why don't we ...?"
08 23 47 08 LMP Yes.
08 23 48 01 CMP Well, we got the pan camera figured out for the new whole show, huh?
08 23 48 04 LMP Really?
08 23 48 08 CMP (Laughter).
08 23 48 10 LMP Stop laughing, you son of a gun, you ...
08 23 48 12 CMP I - I'm happy that it's even ready to come to, it's such a complicated bunch of shit.
08 23 48 25 CMP Okay, these return pictures should come out in the ... see what happens ...
08 23 48 57 CMP Another - Yes. As soon as we get through this other color, you can hand me that other MAG, and I'll get set up for the Earth pictures. I think I'll keep holding it. ... your problem. Why don't - -
08 23 49 12 LMP You know, this thing's ... about 30 degrees ...
08 23 49 17 CDR That right?
08 23 49 21 CMP ... that thing somewhere.
08 23 49 28 LMP ...
... would you hold that thing?

Damn right. Just sitting there, looking at the Moon.

... all right? ... What'd I do with my MAG. Here it is.

Did you take that cover off?

No, not lately. ...

... Huh?

Take that ...

Move it up a little.

... Yes, take these a little bit later.

How's that?

That's about the only way you can get them.

Try to move them.

What?

Try to move them up one.

Yes. No?

Just going to leave these tied down.

... vertical?

Hey, watch the ... Be sure you don't get any of the crap out of that one.
08 23 52 06 CMP Yes.
08 23 52 07 CDR You ...?
08 23 52 10 CMP Yes, that was my Hasselblad pack right here.
08 23 52 12 CDR Well, that wouldn't ...
08 23 52 18 LMP Really need to take a Hasselblad MAG with you.
08 23 52 20 CMP Yes, give me a Hasselblad MAG ...
08 23 52 24 LMP ...
08 23 52 29 CMP Yes, you're right.
08 23 52 30 LMP ...
08 23 52 43 LMP ...
08 23 52 46 CMP Yes.
08 23 53 03 CMP ...
08 23 53 08 LMP All you really need ...
08 23 53 12 CMP ...
08 23 53 14 LMP Yes.
08 23 53 15 CMP Okay.
08 23 53 25 LMP Mine's here. ...
08 23 53 31 CMP Here are mine, okay. ...
08 23 53 37 LMP ...
08 23 53 40 CMP I'll take them.
08 23 53 47 LMP ...
08 23 53 50 CMP How you like them? Okay?
08 23 53 52 LMP ...
08 23 53 59 CMP Look for yours, pal.
08 23 54 00  LMP  (Laughter).
08 23 54 04  CMP  You should be proud - you should be proud of yourself, Jim.
08 23 54 16  CMP  Do you intend ignoring that question?  Are you a naive ...?
08 23 54 24  LMP  I answered it.  Hey, you got to get your -
08 23 54 26  CMP  God!  What a posthole digger.
08 23 54 29  LMP  Chief priority.  Time to do the P20.  ... do it?
08 23 54 37  CMP  ...
08 23 54 44  LMP  Oh.  ... 
08 23 55 17  LMP  ...
08 23 55 25  CMP  Jim, how long has it been since weight?  ... says part 1 - part 2, part 2.  All the rest of you ready?
08 23 55 36  LMP  Yes.
08 23 55 38  CMP  DAC should be set for right now.  Got to notify the ...
08 23 55 50  LMP  ...
08 23 56 07  CMP  Y'all noticing that all that noise is gone?
08 23 56 11  LMP  What?
08 23 56 12  CDR  I don't know if ...
08 23 57 13  CMP  You ignoring that Flight Plan?
08 23 57 15  LMP  Cut it.
08 23 57 17  CMP  Aw, you ain't that bad.  Catch it, son.
08 23 57 23  LMP  ... won't come down.  Help me?
08 23 57 45  CMP  All right, God damn you, come help me.
08 23 57 49  CDR  Boy, oh, boy.
08 23 57 51 LMP All these MAGs ... 2 and a half by 2 millimeter. ...
08 23 58 01 CMP ... bracket.
08 23 58 03 LMP Got a ... bracket.
08 23 58 04 CMP That's 80 millimeter ... up there.
08 23 58 10 LMP No. ... I gave it to you.
08 23 58 33 CMP Hope you don't roll the ... back in there.
08 23 58 38 LMP Can't believe it.
08 23 58 42 CMP Ah! Okay, 2.8, 1/500th, and click one off - which I just blew.
08 23 59 00 CMP Okay.
08 23 59 14 CDR Hey, what time did -
08 23 59 17 CMP Yes.
08 23 59 18 CDR Got that one?
08 23 59 19 CMP Yes, that at the - T-start time, yes.
08 23 59 21 CDR Yes.
08 23 59 26 CMP That solar corona is kind of interesting. You might watch it out the window there. You - you can really - you can really see it.
08 23 59 42 CMP That's right.
08 23 59 44 CDR Are you going ... from here?
08 23 59 46 CMP Well, ENTER. That doesn't work right. Oh, you're trying to ENTER on NOUN 18.
DAY 10

09 00 00 00 CDR  Oh, my. I've got to have a NOUN.

09 00 00 09 CMP  NOUN 18 is attitude. Gimbal angles. There's time.

09 00 00 19 CDR  Well, ...

09 00 00 20 CMP  You loaded - you loaded gimbal angles, to drive to, for some reason.

09 00 00 25 CDR  ...

09 00 00 27 CMP  Is it going there? You changed the gimbal angles in - in P20.

09 00 00 33 CDR  Why didn't I get a P50?

09 00 00 38 CMP  Because you were probably already - you were probably just getting to the P20 attitude.

09 00 00 41 CDR  ... each time. Why don't we both do 20? You've taken up enough pictures.

09 00 00 48 CMP  Did you ENTER on the re - Did you ENTER on it when you got to the attitude?

09 00 00 54 CDR  No.

09 00 00 55 CMP  Well, that - Okay. Call up P20 again and go through that. Okay.

09 00 01 03 CDR  I get a NOUN 18 ... NOUN 78. ... NOUN 18.

09 00 01 12 CMP  What'd you do?

09 00 01 13 CDR  ... option 5?

09 00 01 16 CMP  Yes. Option 5. Yes.

09 00 01 24 CDR  You ... another 20?

09 00 01 26 CMP  Okay? Go.

09 00 01 28 CDR  5.1. ...?

09 00 01 29 CMP  Yes --
09 00 01 30 CDR  -- ...? 5.2?
09 00 01 31 CMP  That's good.
09 00 01 32 CDR  ...?
09 00 01 37 CMP  Oh, it wasn't to the attitude yet, Dave. No won-
dder. You're in - you're in HOLD over there.
09 00 01 46 CDR  Sure enough.
09 00 01 48 CMP  Oh! Blew it!
09 00 01 53 CDR  Well, all I know is I got that needle.
09 00 01 54 CMP  Sure. We're in LOW RATE.
09 00 01 58 CDR  ... needle ...
09 00 02 09 LMP  All I know is --
09 00 02 10 CDR  Can I load P30 now?
09 00 02 11 CMP  No.
09 00 02 12 CDR  ...
09 00 02 13 CMP  No. Not when we're in maneuver. They won't let
you in.
09 00 02 22 CDR  So that's what I did wrong.
09 00 02 24 CMP  Yes. That's why you - that's why you loaded --
09 00 02 25 CDR  I heard --
09 00 02 26 CMP  -- the NOUN 18.
09 00 02 27 CDR  Well, I thought you said --
09 00 02 28 CMP  It'll come up in a major mode but you won't get --
09 00 02 29 CDR  Oh, I thought --
09 00 02 30 CMP  -- You won't get a time display. Yes. You can't;
it shuts off the power to display, like a NOUN 18.
09 00 03 01 CMP  That T-start is right now, too.
09 00 03 04 CDR ... 
09 00 03 07 CMP Uh - 
09 00 03 12 CDR 216. 
09 00 03 14 CMP 216:03. That's right. 
09 00 03 16 CDR We have 15 minutes. 
09 00 03 18 CMP No, we're at 216:03 right now. 
09 00 03 23 CDR ... We'll never complete ... 
09 00 03 28 CMP Yes, we will. That's been all - Well, let's see. Let's get the stick and put in a higher rate in the DAP. Jim? 
09 00 03 35 LMP Get the stick? 
09 00 03 36 CMP Yes. 
09 00 03 50 CMP What the hell's that ... 111. Okay. 
09 00 04 03 CMP Okay. I think that does it. I should have played a 3 while I was at it. Huh. 
09 00 04 12 LMP What? 
09 00 04 13 CMP I should have put in a 3 and really zapped it around. 
09 00 04 26 CDR Three ... 
09 00 04 28 CMP Yes. 
09 00 04 29 CDR Three is a what? ...? 
09 00 04 31 CMP Three is 2 degrees per second. We better do it. 
09 00 04 34 CDR ... 
09 00 04 35 CMP I don't know if I can hit the stick again, only - 
09 00 04 41 CDR How about the boom? Is that extended? 
09 00 04 43 CMP We got the boom now?
09 00 04 44 CDR I don't know.
09 00 04 46 CMP Well, what's the Flight Plan say?
09 00 04 51 CDR Yes, better not.
09 00 04 52 CMP Better not. Yes.
09 00 04 54 CDR You want the ..., don't you? ...
09 00 04 58 CMP Yes, we're almost there.
09 00 05 00 CDR Okay.
09 00 05 01 CMP Yes, we don't have to start here until - Got 5 minutes left - 80 - 8:55.
09 00 05 11 CDR Why is that coming up? Why didn't it come down?
09 00 05 14 LMP Because the mission timer starts. ... Flight Plan ...
09 00 05 18 CMP Yes, because - yes, because of that one.
09 00 05 20 CDR ...?
09 00 05 21 CMP No, this is the mission timer. That - this was - this - Yes?
09 00 05 26 CDR Mission timer, do you set the start and T-stop ...?
09 00 05 29 CMP That's right. No. We're not doing it because we're using P30 instead.
09 00 05 33 CDR Be cool if we set the mission timer anyway.
09 00 05 35 CMP Oh, yes. Sure.
09 00 05 37 CDR And use our GET?
09 00 05 38 CMP You can get it off the DSKY. Hell, the goddam thing's already stopped twice - on its own.
09 00 05 45 CDR What? This one stopped twice?
09 00 05 46 CMP Yes.
09 00 05 47 CDR Really?
09 00 05 48 CMP Yes.
09 00 06 03 CMP You can't read that DET from over here.
09 00 06 06 CDR What?
09 00 06 07 CMP You can't read it from over here to begin with.
09 00 06 14 LMP I got a good idea.
09 00 06 16 CDR ... fails if you move.
09 00 06 21 CMP Well, you - you got the date.
09 00 06 24 CDR ...
09 00 06 26 CMP Yes. You tried G&N and comp fail?
09 00 06 30 CDR Yes.
09 00 06 31 CMP You tried G&N and comp fail? You're screwed anyway.
09 00 06 36 CDR Better start getting our ... TEI.
09 00 06 43 CMP Well, I think that's - kind of pushing the rules.
09 00 06 56 LMP Y'all are getting freaked up.
09 00 06 58 CMP Yes. We might.
09 00 07 05 CDR Need a piece of tape. Ought to be a piece of tape around here somewhere.
09 00 07 13 LMP Yes.
09 00 07 14 CDR Okay.
09 00 07 15 CMP Are you there?
09 00 07 16 CDR Okay.
09 00 07 17 CMP Yes, call up P30 and put those numbers in the -
09 00 07 45 CDR Yes ... zero.
09 00 07 47 CMP I'd just - Yes, I'd just leave all those in there or just load it zero. Okay. ... Doesn't make any difference.
09 00 08 12 CDR Got 417.
09 00 08 16 LMP ... FREE? You want to let it be for a while?
09 00 08 20 CMP Yes, we should. On, no, wait. No, that's okay. Those maniacs can wait on Dave. It won't damp.
09 00 08 28 CDR Huh?
09 00 08 29 CMP It won't damp because we're in ORB RATE.
09 00 08 30 CDR You want to go FREE?
09 00 08 31 CMP Yes. Okay. Okay, now - look at those times and remember them, Dave.
09 00 08 43 CDR Okay.
09 00 08 44 CMP It starts - Well, the first one's at 5 minutes and then we go 6:40 and every 10 seconds after that. Okay?
09 00 08 51 CDR You ... for that?
09 00 08 52 CMP Yes.
09 00 08 55 CDR Got it.
09 00 08 56 CMP Okay, you ready? Okay.
09 00 08 59 CDR MARK. One cycle.
09 00 09 35 CDR Oh!
09 00 09 40 CMP Now turn out all the MDC lights, and just let - watch the DSKY LEB - if - if you can find one down there.
09 00 09 48 CDR MARK. Forty.
09 00 09 50 CMP Yes.
09 00 10 15 CDR Forty.
09 00 10 16 CMP Okay.
09 00 10 24 CDR Thirty.
09 00 10 34 CMP Okay.
09 00 10 35 CDR MARK.
09 00 10 36 CMP Okay, I got the time. You can watch, if you want.
09 00 10 41 CDR You want a mark at 2:50?
09 00 10 42 CMP Yes. No, I'll - I'll get it. Just watch out the window.
09 00 10 45 CDR MARK. 2:50.
09 00 10 46 CMP Enjoy the scenery.
09 00 11 46 CMP If that time is good enough, boy, you wait. At 8 minutes, the Sun'll show.
09 00 11 51 CDR Fifty-five.
09 00 11 52 CMP Yes.
09 00 11 53 CDR Ga! Boy!
09 00 11 55 CMP Isn't that something?
09 00 11 56 CDR Woo-hoo!
09 00 11 57 CMP Isn't that something?
09 00 11 58 CDR Yes, man!
09 00 11 59 CMP (Laughter)
09 00 12 00 CDR Woo-hoo-hoo!
09 00 12 01 CMP I thought you'd like that (laughter).
09 00 12 02 CDR That's something again! (Laughter) Wheee!
09 00 12 04 CMP Okay - DAC off.
09 00 12 07 CDR That's something ...
09 00 12 09 LMP ... Cycle one frame.
09 00 12 11 CDR Okay (laughter). Boy, I love stuff like that.
09 00 12 19 CMP  Now that's pretty spectacular.
09 00 12 21 CDR  It sure is. That's just right between the eyeballs.
09 00 12 23 CMP  Yes. You don't expect it. Oh, yes! Okay. Okay, lift the ... away. Oh, we got - we got a little time. No - there's no big rush.
09 00 12 46 LMP  Okay, remove DAC from window, cover lens, and run at 24 frames per second.
09 00 12 49 CMP  Yes.
09 00 12 51 LMP  Shutter speed, 1/500th, for 2 seconds.
09 00 12 54 CMP  Yes.
09 00 13 04 LMP  Cover lens?
09 00 13 05 CMP  Yes.
09 00 13 12 LMP  CMC MODE, AUTO. Record the MAG.
09 00 13 25 CMP  Okay, we're down to about - oh, 60 percent of the frame, I guess.
09 00 13 33 LMP  Sixty percent?
09 00 13 34 CMP  Sixty percent of the MAG, yes.
09 00 13 35 LMP  How about your frame?
09 00 13 46 CMP  100.
09 00 13 49 LMP  Okay.
09 00 13 56 CMP  Yes.
09 00 13 58 LMP  ... what?
09 00 14 00 CMP  Now, which one you want to use? Use this one?
09 00 14 27 CMP  Okay, we got 1/125th, got --
09 00 14 29 LMP  What's your MAG number? Need that.
09 00 14 31 CMP  ... Yes.
Okay ... get it up there and get it going, we'll be all right. ... Why don't you run one across this way? Now hold it.

Okay, I want back ... Yes, that ought to do it. Run this one down through here.

... What?

I don't think you guys'll make it, frankly.

No (grunt).

... back it off. Oh, yes, that's right. We don't move now, anyway.

Okay.

... Did you let the ... down?

No.

... --

Yes.

-- ...

Huh! (Sigh) Okay.

... Yes, we got it. Is that what you got on there?

... Rate's down.

... Yes. That's - that's about right, Dave.

...
09 00 18 22 CMP Huh?
09 00 18 24 CDR ...
09 00 18 35 CMP Yes. Okay.
09 00 25 37 CDR Did we do a P20?
09 00 25 38 CMP Yes.
09 00 25 41 CDR I thought we called P20 now, Al.
09 00 25 43 CMP Yes, just recall P20. It should do it itself. No, if you get the UPLINK ACTIVITY light, that means it's gone outside the 10-degree dead band, in which case you have to do a VERB 58 - to get back in.

TIME SKIP

09 01 32 39 CDR Back to normal now.
09 01 32 40 CMP Okay. ...
09 01 32 41 CDR Okay.
09 01 33 11 CDR ...?
09 01 33 13 CMP No, ... 15.
09 01 33 16 CC Endeavour, recall the 50 18 and get the attitude, please.
09 01 33 27 LMP Well, I can do it. But -
09 01 33 40 LMP But my needles are not close to center. The needles are not very close to center.
09 01 33 50 CDR I can't hear you.
09 01 33 51 LMP You can't hear me?
09 01 33 52 CDR No.
09 01 33 54 LMP Well, you're not on comm. Yes.
09 01 34 08 LMP We're off about - 20 degrees in pitch.
09 01 34 45  LMP     ENTER.
09 01 34 50  CDR     ...
09 01 34 58  LMP     As soon as you get the 50 18, you hit the ENTER.
09 01 36 13  CDR     ...
09 01 36 15  LMP     Yes.
09 01 36 20  CDR     Now. ...
09 01 36 34  LMP     What?
09 01 36 36  CDR     ...
09 01 36 40  LMP     I can't hear you. Can you get SQUELCH, ENABLE on?
                       There's so much noise in the S-band. I can't hear anything. Yes, I can hear you now.
09 01 37 04  CDR     ...
09 01 37 12  LMP     Why'd they tell us to PRO, then? That wasn't the right thing to do, was it?
09 01 37 15  CDR     ...
09 01 37 17  LMP     Yes.
09 01 37 19  CDR     ...
09 01 37 21  LMP     Yes.
09 01 37 23  CDR     ...
09 01 37 24  LMP     Well, we had a 50 18 - flashing. But we'd already gone past the 10 degrees, apparently. And they told us to PRO.
09 01 37 31  CDR     ...
09 01 37 33  LMP     Yes.
09 01 37 34  CDR     ...
09 01 38 55  LMP     Dave, if you want to put this away, you can. It'd be down in - in R-13, in the camera compartment on
that side. There's a bag there - you know, the MAG bags from the LM.

09 01 39 06 CDR ...

09 01 39 07 LMP No, let's see. Okay, yes. Right in there. See that MAG bag with six in it?

09 01 39 19 CDR ... right in there ...

09 01 39 21 LMP No. We have B and A, and - and that one, and there's another one that was good in there.

09 01 39 33 LMP The others just won't drive.

09 01 41 09 LMP Not bad. Did real well, Dave.

09 01 41 43 LMP I'd better be watching the Flight Plan for this page, because there are a lot of little notes I put in there that -

09 01 41 49 SC ...

09 01 41 51 LMP Kind of hard to understand, yes.

09 01 43 18 CDR Need it now?

09 01 44 13 CDR Think you can ... tomorrow? Think you ... tomorrow?

09 01 44 19 LMP That won't be hard to do.

09 01 44 20 CMP ...

09 01 44 30 LMP A little tennis.

09 01 44 34 CDR ...

09 01 44 37 LMP I'm going to be worried, too, if I don't have that FCS ... on. I should say the FCS - (laughter). Should say the FCS. All day, Al. We'll be in those suits and won't be able to take a crap.

09 01 44 54 CMP Okay. ...

09 01 45 33 LMP I'll look it up there. The menu today - Today is --

09 01 45 45 CMP We're ready to ...

CONFIDENTIAL
We have turkey and gravy, wet pack. Cranberry - orange - pineapple fruit cake. Vanilla pudding, which we had yesterday (laughter). And citrus beverage.

Okay. ... down below.

Yes. I can cut, if you want to put water in them.

... don't see why ... camera for terminator photos.

Okay.

... shave.

Is it? ...

... wet pack, turkey and gravy.

... minus 5 ...

TIME SKIP

Okay. We need GAMMA RAY, BOOM, RETRACT.

After about 3 minutes 15 seconds, it should be gray, and then we'll turn it off.

..., Jim. ... one whole week ...

I'll take the cheese.

... all right ...

No. No. I - there'll be plenty of time for canned.

... mapping camera ...
Y'all want to try the tube?

... mapping camera right now. ...

Hope so.

...

One minute to terminator photos, Dave.

...

15, 19.

How long?

One minute and 40 seconds.

Something on my window. I don't know why they put -

Al, would you turn the LASER ALTIMETER, ON? LASER ALTIMETER, ON.

And MAPPING CAMERA, IMAGE MOTION, ON. Barber pole plus 4. Yes.

No, I just want it ON now. They don't want it - don't want it - you to do that until after you turn it ON.

Yes, but it doesn't say IMAGE MOTION, INCREASE, until after we turn it on - turn the MAPPING CAMERA, ON.

Okay, Al. If you'll turn the MAPPING CAMERA, ON. Yes.

... want?

And IMAGE MOTION, INCREASE to barber pole plus 4.

Yes.

See that crater out there - I don't know whether you can see it out your window, Dave. The one I mentioned looked like it had a contact right through it; one half of it was gray and the other half was white.
... It's right out here. Just east of - that good Russian crater, Svodska [sic] - Sovolska [sic].

... it's a Russian crater.

Sbodska [sic].

Sklodowska.

Sklodowska.

... ...

Yes.

Okay, we're supposed to configure the DSE. Stop, COMMAND RESET, and REWIND.

All right.

It's on the - the REWIND, right - the RECORD ... TIME SKIP

Good.

Got them?

Got them. Okay. Okay, and I'll go ahead and torque those out on the minute. Just give me a mark.

Okay.

Stand by, Al.

Okay.

MARK.

Okay, we'll just check it out here.

Endeavour, you're looking good at LOS minus 60 seconds. Configure the DSE for us please. And we see you've done that; thank you.
09 03 31 31 CMP  Boy, that puts that star smack in the middle. Beautiful. Okay. Are we in P20, Jim?

09 03 31 45 LMP  Yes, P20's coming up. Option --

09 03 31 46 CMP  We --

09 03 31 47 LMP  -- option 5.  

09 03 31 48 CMP  We were in it before, weren't we?

09 03 31 50 LMP  Yes.

09 03 31 51 CMP  Okay. Okay, we got it for TEI ascent. No, wait a minute.

09 03 32 00 LMP  Okay. It calls for GDC ALIGN. Yes, you went back in P20; I'll go CMC MODE, AUTO, huh?

09 03 32 08 CMP  Yes, go AUTO.

09 03 32 10 LMP  Okay, then GDC ALIGN.

09 03 32 14 CMP  That has to be done from your couch there.

09 03 32 16 LMP  Yes.

09 03 32 18 CMP  Can you do it?

09 03 32 20 LMP  I can do one. I'll -- probably use the checklist. It's been a long time since I've gone through one.

09 03 32 33 LMP  Minus 5 and 25.

09 03 32 43 CDR  ... burn, Al? Get all your ... all set? No, you're ... open.

09 03 32 48 CMP  Yes, I guess it would ...

09 03 32 50 CDR  ... TEI?

09 03 32 52 CMP  Put the optics away. ...

09 03 32 56 LMP  Well, we might as well get in our regular couches then, huh?

09 03 32 59 CDR  What?
Day 10

09 03 33 00 LMP  Do you want me to switch around to regular couches there?

09 03 33 02 CDR  Yes. ...

09 03 33 07 LMP  A GDC ALIGN is required. And then a P20. I think we need to - change the deadpan [sic] - dead band.

09 03 33 25 LMP  And when we come - come around, we get the maneuver pad.

09 03 33 28 CMP  How long until the shaping burn?

09 03 33 29 LMP  Two hours.

09 03 33 31 CDR  No. ...

09 03 33 33 CMP  Well, we ought to start getting cleaned up then for it. Let's see. Yes, yes. We don't have a sheet. Okay.

09 03 33 55 LMP  ... G&C Checklist, I guess that - Where's that in the G&C Checklist? Let's see what we're doing here.

09 03 34 02 CDR  ...?

09 03 34 06 LMP  Okay. Let's see what I've got here now. I'll do the - do a GDC ALIGN, huh?

09 03 37 10 CDR  Did you ... the JETT bag, Al?

09 03 37 12 CMP  Yes. ... got it here in B-l.

09 03 37 26 LMP  Hey, Al. We want to change the dead band in P20 here - -

09 03 37 29 CMP  Yes.

09 03 37 30 LMF  - - 5 degrees.

09 03 37 31 CMP  Okay. Do a VERB 22 NOUN 79.

09 03 37 40 LMF  Oh, I see that. Is that all you have to do? You don't have to - while we're in a - -

09 03 37 42 CMP  That's all you have to do.

09 03 37 48 LMF  Just put in this entry bit, huh?
09 03 37 49  CMP  Yes.
09 03 37 50  LMP  Plus 005 00?
09 03 37 51  CMP  Yes.
09 03 37 58  LMP  Okay. That's entered.
09 03 38 07  CMP  Okay. That should do it then.
09 03 38 35  LMP  Need any help, Al?
09 03 38 36  CMP  No, I can get it all right, Jim.
09 03 39 43  LMP  Let's see, did we decide to throw those two urine bags and the JETT bag? I don't have to - transfer those?
09 03 39 48  CMP  Don't dump those yet. We're going to jettison them.
09 03 39 52  CDR  Yes, we can just jettison them.
09 03 39 53  CMP  Yes.
09 03 39 54  CDR  When is the next dump period?
09 03 39 58  LMP  Coming up in about 2 hours.
09 03 39 59  CDR  Before the burn, I guess.
09 03 40 09  LMP  Hmm. After the burn.
09 03 40 23  LMP  Just after the burn is the dump.
09 03 40 25  CDR  Oh, really?
09 03 40 26  LMP  Yes.
09 03 41 54  CMP  We're in pretty good shape, Dave, except I don't know what to do with LEVA bags for the burn.
09 03 41 58  CDR  With the what?
09 03 41 59  CMP  With the LEVA bags.
09 03 42 00  CDR  You got straps for them, to clamp - to clamp them down. No. There are three straps down on the EVA tunnel ... --

CONFIDENTIAL
Hmm.

And strap down those — and I'd suggest that somebody reach up and strap — and strap them down.

Could be we better do that.

You got them?

Yes. They ought to put the utility straps in the —

We better get these other cameras tucked away, too. Where would you suggest putting — —

Hey!

— these cameras we got?

Why not put them all in B-1? We could stuff that JETT bag around them so they won't get banged up too much. They'd probably all fit in there.

Or you could just put them in the JETT bag?

Well, we might want to use them again.

Well, we know where they are. Yes.

What's this bag here?

What?

That's your tether kit.

Oh. Okay.

You're going to need it.

That's good. That's good.

... Everything except the PPK.

Yes. What's — what was in that PPK, by the way?

I don't see how you can get used to it with all these bags, huh?
09 03 43 37 CMP Yes.
09 03 44 05 LMP ...
09 03 44 07 CMP ...
09 03 45 39 CMP Um.
09 03 46 04 CMP Um. Um-huh --
09 03 46 10 CDR What?
09 03 46 11 CMP -- Very interesting. I don't know. I'll let you know in a minute. Oh, there we are. Christ, I thought they were -- I thought somebody'd blown it.
09 03 46 20 CDR Huh?
09 03 46 21 CMP I thought somebody'd blown it. The OPS straps weren't in the OPS strap pouch.
09 03 46 26 CDR You don't think --
09 03 46 27 CMP Yes (laughter). Huh?
09 03 46 29 CDR You don't think that ...
09 03 46 30 CMP Yes, who'd do something like that?
09 03 46 32 CDR ...
09 03 46 33 CMP (Laughter) Yes.
09 03 47 01 CMP Okay.
09 03 47 37 CDR You know, I think we better dump -- we better dump those out. We better not put them in the JETT bag.
09 03 47 44 CMP Huh?
09 03 47 45 CDR Probably ...
09 03 47 46 CMP Yes, they're apt to break.
09 03 47 53 CDR You don't have to dump. Jim will help you.
(Laughter) Yes. Okay, how about gathering up as many of the utility straps as you can around. Let's see if we can get enough here to put these LEVAs down.

There's some up here in ... I can't disagree with gathering them up.

These won't work on here.

Pull on it here. Pull those out just a little.

Here, Jim. I think this is yours.

Mm. It's anybody's ...

Huh?

...

In here?

...

Which? Oh, yes.

...

Yes, that one - I cleaned it out. And that - we're going to have to use that tomorrow.

...

So you want to put that into B-1.

...

Yes.

Hey, Al? ... gamma ray and alpha ray and ... all that stuff ...

Not supposed to, Dave. They don't - they don't like it.

... they give us 2 minutes to dump.

Two minutes?
09 03 50 39 CDR  Yes, 2 minutes between dumping and turning on all that gamma, X-ray, and alpha ray stuff.

09 03 50 43 CMP  Well, the gamma - We'll turn it on.

09 03 50 46 CDR  What?

09 03 50 47 CMP  We'll turn it on.

09 03 50 49 CDR  It'll screw it up, won't it?

09 03 50 50 CMP  Well, it ain't going to screw up the experiment. It'll screw up their data. And they'll go back to the Flight Plan and look, and they'll say, "Yes, sure, they're dumping."

09 03 51 24 CMP  Where's the other needle there, Jim?

09 03 51 26 LMP  We aren't even counting ...

09 03 51 27 CMP  We don't care about that. Dave, if you can reach around there on the back of you, on that LEVA that I put on the - on the - on A-8 back there, there's another stop towards the head end - If you want, go ahead and snap it.

09 03 51 40 CDR  Over this one --

09 03 51 41 CMP  Yes, I already put a strap on it, but I couldn't reach it.

09 03 51 47 CDR  ...

09 03 51 50 CMP  (Laughter) Yes.

09 03 52 01 CDR  ...

09 03 52 02 CMP  Huh?

09 03 52 03 CDR  You may not believe it, but there's no snap --

09 03 52 05 CMP  Oh, there's no snap up there? Oh, shit! Can we tie it to something up there?

09 03 52 16 CDR  Yes.

09 03 52 17 CMP  Actually, it'll be all right with one strap probably. It won't --
No, it's not going to go anywhere.

In fact, these other snaps don't really cinch things down tightly; they just kind of hold them in place.

Gee, we're running out of snaps.

Hey, I bet you we can put a couple of bags and a couple - helmets in the top of the PGA bag.

Okay. Yes, we'll be using it on the way home. But we can put it away for now. It's probably just as well.

Yes.

It's hot in here. You want to undo it?

Yes. That's an easy one.

By the UVs and goes into A-8, though.

What?

Goddam U thing - UV thing goes in the A-8, and that's underneath all the LEVAs and everything else.

... somewhere else ...

Excuse me, Jim.

... 

Yes, they go down here.

What else have we got?

Pardon?
(Laughter) Before - before I go tearing into those lockers again, what else have we got?

Yes. Where's MAG R?

Ah, I think it's ... there.

Is it used up yet?

Yes, it is. Didn't we do it --

All right. Stash it away here then.

Here's R. Does it belong there with all that stuff?

I don't think ...

I got three hands full. How about the dark slides for our -

...  

Huh?

... use one of those?

No.

Huh?

Uh-huh.

What about the ...?

Have to pull it on. The N-pack, too.

...  

...  

Get me that cinch. I must be getting weak.

TIME SKIP
09 05 46 28 LMP ... it in the SIM bay, huh?
09 05 46 31 CDR Yes.
09 05 46 44 CDR Okay. Waste water's down to about 20.
09 05 46 57 LMP Okay, we'll purge. Are you going to time her?
09 05 47 01 CDR Un-huh.
09 05 47 35 SC ...
09 05 47 38 CDR Fifty.
09 05 47 48 CMP Up to RELIEF, huh?
09 05 47 49 LMP Yes.
09 05 47 50 CDR Un-huh. Up to RELIEF, right?
09 05 48 03 LMP Eighty degrees.
09 05 48 07 CDR ... to do that on the front-side pass?
09 05 48 09 LMP Yes.
09 05 48 12 CMP Think we'll be okay once we get out in the -
09 05 49 05 CDR H₂ PURGE LINE HEATERS, OFF.
09 05 49 08 CMP All you got to do is look after the purge, huh?
09 05 49 09 CDR Yes.
09 05 49 11 LMP I'm going to purge.
09 05 49 30 CDR We got this great big filter floating around. Why
09 05 49 34 LMP is that floating around?
09 05 49 36 CDR I'm sorry, Dave. I'll throw it in the diaper bag.
09 05 49 39 LMP Gee, Jim, we got to make another burn.
09 05 49 44 CMP Yes.
09 05 49 44 CMP I didn't realize we were so close to another burn. ...

... close.
09 05 49 47  CDR  No, I didn't either.
09 05 49 52  CMP  ...
09 05 49 55  CDR  Yes.
09 05 50 09  CDR  Where'd you put the second garbage can?
09 05 50 10  CMP  ...
09 05 50 22  CDR  Al, wait. Stick it up here. No, wait.
09 05 50 58  CDR  Did you have any tissues down here when you did your thing, Jim?
09 05 51 01  LMP  No, I didn't have any, Dave.
09 05 51 03  CDR  How did you get by?
09 05 51 05  LMP  How'd I get by? I used the --
09 05 51 06  CDR  Yes.
09 05 51 07  LMP  -- UCTA. I used the UCTA. So I had to dump it anyway.
09 05 51 15  CDR  Yes. Right over there with the camera is, we got to configure the DAC anyway. Open it up. You got to put the DAC together anyway for photographing the subsat.
09 05 51 42  CDR  What? Yes. Didn't think about that.
09 05 59 01  LMP  ... in the way.
09 05 59 04  CMP  I'll get it --
09 05 59 05  CDR  Okay, I got it.
09 05 59 06  CMP  Okay.
09 05 59 12  CDR  There. ...

TIME SKIP

09 06 17 54  LMP  Clear.
09 06 18 00 CMP    Oh, my. Look at this. That's a good picture.
09 06 18 06 CC     Hello, Endeavour; this is Houston.
09 06 18 10 CDR    Houston, Endeavour. Go.
09 06 18 15 CC     Roger, Endeavour. We're requesting you verify your systems - DATA SYSTEMS, ON, and the S-band - -
09 06 18 21 CMP    Yes.
09 06 18 22 CDR    Right here it is.
09 06 18 23 CC     -- AUX switch to SCIENCE, please.
09 06 18 24 CMP    Huh!
09 06 18 25 CDR    Yes. That's verified, isn't it?
09 06 18 28 CMP    No, DATA SYSTEMS isn't ON.
09 06 18 30 CDR    Well, it wasn't in here then.
09 06 18 35 CMP    It sure was and I missed it. I'm sorry.
09 06 18 40 CDR    Okay; that's verified now, that the DATA SYSTEMS are ON now.
09 06 18 46 CMP    Shoot!
09 06 18 48 CDR    They're easy to overlook, aren't they?
09 06 18 49 CC     Okay, Dave; we copy that. I've got a map update, REV 75, when you're ready to --

TIME SKIP

09 07 47 33 CMP    You get the other ones. THRUST A and B to NORMAL after the PRO.
09 07 47 37 CDR    Roger.
09 07 47 45 CMP    One minute.
09 07 48 11 CDR    And there's the average g coming up. Twenty-nine seconds.
09 07 48 18  CMP  EMS MODE, NORMAL -
09 07 48 19  CDR  NORMAL.
09 07 48 22  CMP  Twelve seconds ullage.
09 07 48 33  CMP  ULLAGE.
09 07 48 37  CDR  Ready for the PRO?
09 07 48 38  CMP  Ready for the PRO.
09 07 48 39  CDR  Okay, 99 PROing.
09 07 48 45  LMP  B valves.
09 07 48 46  CDR  There it goes.
09 07 48 48  CMP  Oop! Steady.
09 07 48 49  LMP  - - 4 - 5 - 6 - -
09 07 48 50  CMP  A's on.
09 07 48 51  LMP  A valves.
09 07 48 53  CMP  Looks good.
09 07 48 57  CDR  EMS and G&N agree.
09 07 48 59  CMP  Good.
09 07 49 04  CDR  Tracking 217 now. GDC looks good.
09 07 49 11  CMP  Man alive! Watch them push.
09 07 49 13  CDR  Powering down now. Okay, we trim here in about - just short of 100.
09 07 49 18  CMP  Okay. DSKY and EMS look good, at about 50.
09 07 49 24  CDR  On the dead band?
09 07 49 26  CMP  Roger.
09 07 49 34  CMP  DSKY and EMS are running about 35.
09 07 49 45  CDR  GDC looks good.
09 07 49 46 LMP  One minute. ...
09 07 49 56 CDR  Tracking 219.
09 07 50 01 LMP  Are we going to decrease on the - flow valve, Al?
09 07 50 06 CDR  Okay, EMS and DSKY are about 50. You got about a minute to go.
09 07 50 11 CMP  Roger.
09 07 50 16 CDR  Tracking 220. EMS and DSKY look good.
09 07 50 37 CDR  Tracking 221. Looks very good.
09 07 50 40 CMP  Okay.
09 07 50 41 CDR  Twenty-five seconds to go.
09 07 50 43 CMP  Roger.
09 07 50 46 CDR  Twenty seconds to go.
09 07 50 52 LMP  Okay, here comes the count. 10, 9 --
09 07 50 59 CDR  ..., Al?
09 07 51 00 LMP  -- 8, 7, 6, 5, 4, 3, 2, 1, 0 --
09 07 51 07 CMP  THRUST, OFF; automatic.
09 07 51 11 CDR  Okay, babe, your trim's to .2. Forget the Y.
09 07 51 15 CMP  Wait. Forget the Y?
09 07 51 16 CDR  No, you - X and Z, forget the Y.
09 07 51 18 CMP  Okay. We'll let .2 ... again. Okay, Jim.
09 07 51 25 LMP  Okay. I'm ready. 1, 2, 3, 4 - TVC SERVO POWER 1 and 2, OFF.
09 07 51 33 CMP  OFF.
09 07 51 34 LMP  MAIN BUS TIES coming OFF.
09 07 51 55 CDR  Right on 221. Right down the tube.
09 07 51 58  CMP  Yes. Good act.
09 07 52 02  CDR  Yes --
09 07 52 04  CMP  I'd swear ...
09 07 52 05  CDR  -- ...
09 07 52 06  LMP  Okay, Al, EMS FUNCTION, OFF.
09 07 52 08  CMP  OFF.
09 07 52 09  LMP  EMS MODE, STANDBY.
09 07 52 10  CMP  STANDBY.
09 07 52 11  LMP  RHC and THC, locked.
09 07 52 12  CDR  Locked.
09 07 52 13  LMP  DEADBAND, MAX.
09 07 52 14  CMP  MAX.
09 07 52 15  LMP  TRANSLATION CONTROL POWER, OFF.
09 07 52 16  CMP  OFF.
09 07 52 17  LMP  ROT CONTROL POWER, DIRECT, two, OFF.
09 07 52 18  CMP  DIRECT, OFF.
09 07 52 19  LMP  BMAG MODE, three, RATE 2.
09 07 52 20  CMP  RATE 2.
09 07 52 21  LMP  CB DIRECT ULLAGE, two, open.
09 07 52 22  CDR  Open.
09 07 52 23  LMP  CB SPS, PITCH 1 and YAW 1, open.
09 07 52 26  CMP  YAW 1, open.
09 07 52 27  LMP  CB SPS PILOT VALVES, MAIN B, open.
09 07 52 30  CDR  B --
09 07 52 31 CMP MAIN A and MAIN B, both open.
09 07 52 33 LMP Okay, CB EMS, two, open.
09 07 52 34 CDR They're open.
09 07 52 35 LMP Okay. PCM BIT RATE going LOW.
DAY 11

10 02 28 08 LMP Cool it here for a minute.
10 02 28 20 CDR Okay, Houston; 15. It looks like we have a good seal. How's it look down there? (Cleared throat)
10 02 28 42 CDR Okay, thank you. Okay, 601, OPEN? 601, REPRESS O\textsubscript{2}, OPEN.
10 02 28 49 CMP It's OPEN.
10 02 28 50 CDR Monitor REPRESS O\textsubscript{2} indicator to zero.
10 02 29 00 CMP Okay. It looks zero now, Dave.
10 02 29 02 CDR Okay. So, you let your umbilical flow bring every - the cabin up to 3.
10 02 29 07 CMP Roger.
10 02 29 11 CDR That's very nicely done. That's about - 22 minutes. Which is just about what we figured. You went back and looked at all that stuff. So that's just about right.
10 02 29 52 CDR It's fun out there, isn't it?
10 02 29 54 CMP Mm-hmm. Should have stayed longer.
10 02 29 57 CDR (Laughter) You done good. You made a lot of people back there very happy.
10 02 30 04 CMP Roll over and let me take another look again.
10 02 30 11 CDR Well, I'll tell you what, your - your left arm or something's covering up the light over there.
10 02 30 16 CMP The OPS is, I guess.
10 02 30 19 CDR Really bad lights in here.
10 02 30 20 CMP Okay, there. I can see it now.
10 02 30 23 CDR We're at 2.4, about. So we'll just let your flow bring it up to 3. Gee, I had a great view on the TV. Did you turn the TV off, Jim?
No, I didn't --
I'll turn it off.
Can you reach it?
Yes. There. Thought I turned it off.
Can you reach the SCIENTIFIC TV switch? The S-band TV switch, Jim?
No, not yet, Dave.
Okay. Maybe I can. No.
I don't think there's any rush on that, is it?
No.
I'll get it.
Here, give me it first, Al.

TIME SKIP

We need the repress time on the cabin. ...
Yes.
Ten days and 5 hours we've been gone, Jim.
Long time. We beat your old record.
By 3 minutes.
Sure does. Went farther from home, too.
That's great.
Didn't go as far.
Let's not count the miles.
...
10 05 14 16 CDR  Huh?
10 05 14 17 CMP  Didn't go as far, but went farther.
10 05 14 19 LMP  Yes, coming back.
10 05 14 22 CDR  And a lot more fun, too.
10 05 14 30 CMP  A lot more to it.
10 05 14 35 CDR  Big Dipper, do you know, on 9, we could have missed any one thing and pressed on.
10 05 14 41 LMP  Yes.
10 05 14 42 CDR  Here, it's a lot different; you can't miss anything and press on.
10 05 14 46 CMP  Well, it looks like we can't miss anything.
10 05 14 49 CDR  Very different. Very different.
10 05 15 13 CDR  This is sort of an all-or-nothing kind of operation, you know it?
10 05 15 18 CMP  Yes, it really is, you know. It's really all your eggs in one basket, boy. I got to thinking about that after you guys left for your descent. Once you start that descent, man, that - that's it - -
10 05 15 40 LMP  We're all hanging out.
10 05 15 41 CMP  We're there. That's right. It's all hanging out from there on.
10 05 15 46 LMP  ...
10 05 15 54 CMP  It would be better for ... to put pills in all the food drawers.
10 05 15 59 CDR  (Laughter) For sure.
10 05 16 02 CMP  Make him ...
10 05 16 03 CDR  Let's put them away somewhere.
Where will I put them? It's the last time I'm saying it, but you better not lose your pills.

You didn't see them in your TSB, did you, Jim?

What?

You didn't see the pills in your TSB when you cleaned out, did you?

No. ...

Ohh, what did I do with it?

...

It's almost back to normal times.

Where did you see them?

Down in U-1.

Do you really know what ...?

...

...

Oh! Did you notice anything loose?

Well, I thought I saw - Well, I saw a - -

Hey, do you guys ... get some orange juice? ... Let's enjoy it - let's enjoy it while we can.

...

Except for bad stuff, we can always put up with it for 1 more day.

Yes, that's right. Well - Hey, let's - ... will be our last meal. We have three meals below and breakfast ... 1 day.

And a long way to go.

Oh, hush.
Hello, Houston; this is 15. Loud and clear, and I got your first message, Karl. Sorry.

..., Al. We've got some sort of problem on the ground circuits here. ... in contact with you.

No, we're here.

Roger. Very good.

(Cough)

Al, I have a couple of questions from ...

Oh, yes. That's right. That's great. Okay, Karl. I'll tell you what, I'll give you a call back in about 10 minutes when I'm ready.

...

No, he's got some questions on the SIM bay.

SIM bay looks pretty good.

What'd ...?

I'm coming. I'm coming, Jim. ...

Yes, I can see through on the handles.

I didn't even see any scorching or any burning or anything down there.

...

The covering on the - on the service module, if it hadn't been covered, boy, that would have been burned and scarred and scorched and everything else.

Yes. That's right.

Yes. Yes. Excuse me 1 second, will you?

Excuse me, Jim. Let me get out of your way here.

...

Really?
Well, I guess it doesn't make any difference on this food if we take it back home anyway.

Yes, that's probably true. They can decontaminate it back there.

Sure.

You can tell them we ran out, though. Do you think this salad's good, Al?

My what?

Sandwich spread ... It's a whole half a can.

... 

Sure you can, Jim.

We have to finish after you.

Okay, I'll eat it.

That's right.

What?

If you wouldn't complain so much, we wouldn't leave you so much.

You guys didn't leave me nothing.

Freak you!

I'm thinking

(Laughter)

What kind of desserts we got there, Jim? A lemon pudding, huh?

Mmmm.

...

Yes, you're right, mouth, and I'm going to catch it ...

I'm ready, if you can catch it.
(Cleared throat) That's the only way a power bowler makes it.

... 

Huh? Yes, I suppose we ought to think about doing that. We can get to all that stuff now.

Bright idea. ...

I would.

That's a pretty good sandwich.

Mm-hmm.

How much food we got left?

I don't know, at least a couple of days.

Six-foot waves in the recovery area, huh?

Yes.

That'll be sporty.

Yes, if we can dodge and land, that's great.

Yes.

That's better than dead calm.

It is?

Yes. ...

It's probably because the power's ...

Hmm.

That's why we had so much trouble on 9. ...

Why can't we just hop on over her pretty good in that fashion, too?

Yes.
It's not that bad, boys.

Houston, 15. Go ahead.

... 

Okay, Karl. Thank you.

Okay, Houston. Boy, oh, boy, I used to think it was a good thing to get on a flight and then they could only talk at you one at a time. Whew, boy! Now, I think it's a good thing to get back so you - you don't have to listen to that goddam radio all the time.

The DAC, yes. But the Hasselblad's above your head.

No, mine's - I don't think so. No, that's Jim's.

What else we got?

It's time for the UV stuff, huh? Let me get out of your way. You couldn't find any more pills, right?

... 

... 

No, I thought I put them in your TSB. I just saw them hanging there just before we started all that stuff, and I don't know.

... 

Why don't you get the ...?

Okay.

Don't forget to ... 

ION - ION SOURCE to STANDBY.

... 

Okay.
Okay. Minus 76 and 117.

Okay. We copied your comment on the SIM bay door jettison, and further questions go as follows. The white coating in the SIM bay, were - did you notice that any of them were obviously discolored or - or coated from contamination or overheating?

I saw no evidence of heating in the SIM bay. I saw no evidence of discoloration of the white surfaces. There were (cleared throat) as - as best I could tell, no particulate matter that had come to rest on any of the surfaces in the SIM bay. It looked very, very clean. And - even a - across the top of the mapping camera were - was a - -

... and just delete the note here.

... Stand by 1 second. 247 plus 30. Also, we would like to add "MASS SPECTROMETER MULTIPLIER, HIGH; DISCRIMINATOR, LOW."

TIME SKIP

Okay, good deal.

Just completed one.

Did you do one?

Yes. I'll talk to him. Bob, we just completed one retraction for 33 seconds.

Okay, we're starting our time.

... And away we go.

... Hey, you woke up just in time to eat again, Dave.

... fresh.
To sleep in ... work ...
Okay, valve pressure is getting good and ... is ...
Surge tank pressure greater than 400?
Yes, 487. ...
... Any surge?
Yes, it's 600.
...
Yes.
...
...
You got that solar stuff?
...
Sure a relaxed schedule here today.
We're going along all right until we get to ...
You never do any more UV work, Al?
Yes, we get another one tomorrow.
Hand me the log there, will you? Oh, we don't have the log out, do we?
...
It might be in my TSB. My ... TSB.
...
Let's see. I have a G&C Checklist over here. But I don't have the - I don't have the other good information. I take it back; I have it. I have it.
10 08 06 20  LMP  Did you take any UV photos in - in orbit?
10 08 06 28  CC  15, Houston. Over.
10 08 06 30  CMP  Go ahead. Go ahead, Houston.
10 08 06 38  CC  Roger, 15. We'd like to get a PITCH of minus 40 and YAW, 90, for the HIGH GAIN ANTENNA. And then, if you change your antenna switch to HIGH GAIN without hitting the COMMAND RESET switch, we'll maintain comm that way, please.
10 08 06 59  CMP  Yes. Okay.
10 08 08 30  CC  Apollo 15, Houston. Over.
10 08 08 36  CMP  Go ahead, Houston.
10 08 08 39  CC  Negative. You did the right thing without us calling you. Thank you.
10 08 08 45  CMP  Whatever that was, okay.
10 08 08 49  LMP  Are we going to press on with the high gain?
10 08 09 21  CDR  Yes, yes. If you just get your ... down here, ...
10 08 09 30  CMP  Ah, mark it.
10 08 09 32  CDR  ... We want to take four breathing samples and do our ... What do we have - we have about 50 left to make, don't we?
10 08 09 40  LMP  We have 50 in this one.
10 08 09 41  CDR  ...
10 08 09 43  CMP  Okay.
10 08 09 44  CDR  ...
10 08 09 52  LMP  Yes.
10 08 09 53  CDR  ...
10 08 13 23  CMP  ... change that one.
Bring it in...

You should bring that. I used the scissors to cut mine on the LM, but — Is there a file on the end of those scissors?

I don't think so. That one's...

Not much of a file, huh?

I got a razor blade (laughter).

...

Yes.

Yes.

...

Okay.

Okay.

15, Houston. Your rates look good to us...

Okay, Bobby.

Maybe we better turn the heat up a little in here.

Getting cold?

My feet are a little cold. I wonder where my — my little slippers went.

Open up my — open up my sack. Here's my little slipper.

Get me into my slippers in here.

Are they yours?

Two-hundredths.
10 08 16 16  LMP  I'll take them.
10 08 16 21  CMP  ...
10 08 16 25  CDR  ...
10 08 16 26  LMP  Yes.
10 08 16 27  CDR  ...
10 08 16 31  LMP  Yes, I think I did.
10 08 16 32  CDR  ...
10 08 16 42  LMP  No. I think I - There is one.
10 08 16 43  CDR  Are you sure, Jim?
10 08 16 55  LMP  The last time I saw it, we - it was in B-1. You know, wrapped in there with the - the JETT bag. But it's not in there any longer.
10 08 17 04  CDR  ...
10 08 17 06  LMP  No, it's not in there now. Just - just the - -
10 08 17 10  CDR  ...
10 08 17 11  LMP  It's not in there now.
10 08 17 12  CDR  ...
10 08 17 14  LMP  I don't know, Dave. I'll have to look. I don't know - I don't know who took that stuff out of B-1.
10 08 17 20  CMP  ...
10 08 17 21  LMP  What'd you - Al, the one - the cam - we had the 500 - millimeter camera, Al?
10 08 17 27  CDR  ...
10 08 17 30  LMP  Yes.
10 08 17 31  CDR  Remember, we pulled the cameras out ... and put them in the JETT bag.
10 08 17 35  LMP  Yes.
10 08 17 36  CDR  I gave you yours, and you ...
10 08 17 39  LMP  You gave me my camera at that time?
10 08 17 41  CDR  Yes, ...
10 08 17 45  LMP  Tell me where it is and I'll look.
10 08 17 46  CMP  Yes.
10 08 18 38  LMP  Did you find ...?
10 08 18 39  CMP  Yes.

TIME SKIP

10 08 32 09  LMP  I think this package of MAGs goes into - A-8.
10 08 32 12  CDR  ...
10 08 32 17  LMP  Ah, you think so, huh?
10 08 32 41  CMP  Should be pictures ... we used all that film. ... It picked up a little here ...
10 08 32 55  CDR  Who's going to ...?
10 08 32 58  CMP  Where's your bag? ...
10 08 33 06  CDR  It's down here right now. I got to get these straightened out.
10 08 33 18  CMP  ...
10 08 33 28  CMP  Yes.
10 08 33 29  CDR  ...
10 08 33 39  CMP  I'd like - I'd like to get a MAG of that, too. Start eating it. ...
10 08 33 58  CDR  ...
10 08 34 06  LMP  The MAG, you mean?

[Handwritten note:...]
... Well, no matter what you do, it's got to come back tightly, before you start it.

I knew you could, but you could - you could do it ... perfect here, or you could ... Now can you get it started?

Yes.

Al, one pack of this film goes in A-8, the 70s in the LM.

Yes.

... 40. Want three of them?

Yes.

Did you get three?

Yes.

Okay.

We're going to get the other three in today. We'll have 13. We'll have to split the package up.

... We can put some MAGs in here.

Yes.

We only got this one MAG.

... that?

Right on. Why don't we just ...?

Probably, because nobody can ...

Probably.

... in there? Al. That bag is much too big to fit in there.

... but we can certainly get ...
10 08 38 47  CDR  We need one bigger than this, though.
10 08 38 49  LMP  Well, this bag probably should not have come over from the LM. I used this bag, though, to wrap up these - these MAGs. You know, neither one have been used.
10 08 39 29  CMP  I think they might be ...
10 08 39 51  CDR  What are you going to get out of here?
10 08 40 01  CDR  Carry it for me. Can't help but be better.
10 08 40 12  LMP  You got to work - work it out.
10 08 40 15  CMP  ... that one ...
10 08 40 18  CDR  ...
10 08 40 19  CMP  I wouldn't ...
10 08 40 22  CDR  Yes, I wouldn't ...
10 08 40 25  CMP  Yes. Tool - tool B on the - wait - wait a second.
10 08 40 48  LMP  Tool B or tool E?
10 08 40 51  CMP  Tool B.
10 08 40 53  LMP  From the LM?
10 08 40 55  CC  Apollo 15, Houston. It's retract time.
10 08 41 01  CDR  Thank you, Bob.
10 08 41 41  CDR  What?
10 08 41 46  LMP  Hey, I forgot to cut - I didn't cut the ion off.
10 08 41 50  CDR  Cut the ion ...?
10 08 41 52  LMP  No. We should have cut the hammock straps. Should have got those, too, before we jettison them.
10 08 43 01  CDR  No, those are the LM pans. ...
Hey, Dave? Yes, you got them.

TIME SKIP

We do UV photos twice. Two more - UV photos two more times.

... your film.

It's kind of nice having some room down here, isn't it?

It sure is.

You don't want to go through this contamination control with the vacuum cleaner, do you, Dave?

I don't think we're required to do it.

Okay.

No, we don't...

We don't...? ... mention down-range control. They're standing by to give some water on it anyway.

Oh, and then CDR doffing biomed harness. LMP donning. Alpha X-ray. Let's get a little SIM bay and then eat. Eat and then we do a canister change. You do a little P23 stuff. Then we'll get ready to go to bed.

Three hours to bedtime.

... sleep. ...

... 3 to 4 hours ...

... here?
Otherwise, it would have been pretty boring.

... ... ... ... ... ... ... ... ... ...

(Laughter)

You work mighty hard, I'll tell you.

What ...?

You work mighty hard.

No, a little ...

I wish I would have tried running alongside the Rover at a - the same pace, you know, to see how --

You'd have never stayed with it, Jim. You know ...

Yes, true.

... -- ...

I would have liked to have, you know, to run alongside of it. It'd been neat to do a few things like that, you know.

What?
It'd been neat to try a few things like that.

Yes. I know. Yes. ...

You can take off your biomed harness, Dave.

Whoo!

He'll lose sleep for 9 hours tonight.

Good! ...

Can you see the Moon?

Oh, yes.

Can you get that? Thank you.

On a lunar eclipse - Let's see, we take a total there of -

...

No, we take some with the EL.

Yes.

Yes. We take eight with the EL.

What kind?

Color.

...

Yes, eight with color.

Here's some more Lunar Orbiter.

Is that the same?

No, you have it on two different pages.

Oh, yes.

Hey, what was this one for?

Don't you have any more?
10 09 27 09 CMP ... think we need any ...
10 09 27 12 CDR Yes. ... 
10 09 27 15 LMP It's in the lockers.
10 09 27 20 CDR ... more?
10 09 27 22 CMP ... time to figure it out - figured out ...
10 09 27 26 CDR Going to give them ...?
10 09 27 31 CMP ...
10 09 27 34 CDR ...
10 09 27 38 CMP Yes, you got to reckon with him yet.
10 09 27 40 CDR Huh?
10 09 27 41 CMP You're going to have to reckon with him yet on those ...
10 09 27 42 CDR Yes. ... make sure to recommend that he ...
10 09 27 49 CMP Yes.
10 09 27 52 CDR ...
10 09 28 00 CMP Yes.
10 09 28 24 CC Apollo 15, Houston. About 2 minutes to MASS SPEC BOOM, DEPLOY. And we'd like a DELTA-T on the length of time it takes to deploy it, please.
10 09 28 34 CMP Roger, Bob.
10 09 29 51 CDR (Laughter) They can't tell that, I don't think.

TIME SKIP

10 09 43 03 CDR There must be a MAG around somewhere. There must be two of them.
10 09 43 07 CMP In the bag.
Okay.

Now, all we're missing is S, per his ...

Is that MAG hooked up?

I don't know.

I've got - I've got two whole reels of color stereo.

Yes, that goes back up for ...

Why?

Why?

Why?

Let's see. Next is the ...

Huh?

Huh?

One more time. Ready?

Yes.

You got it?

Over here.

Oh, yes.

God damn.

Huh?

Al, what all is there?

We have turkey.

Turkey?
10 10 13 35 CMP Yes.
10 10 14 22 CDR Do we have something extra for lunch?
10 10 14 37 CMP Ham.
10 10 15 26 CDR As you're loading it.
10 10 15 29 CMP Oh, I - you know, I think we can do it with ...
10 10 16 03 CMP Ah, yes.
10 10 16 16 CDR Hey, I'd - I'd like to ... Yes. ...

TIME SKIP

10 10 35 08 CMP I'm just fine. Just fine.
10 10 35 24 CMP I'm so damn happy; nobody could give me any better service.
10 10 37 40 CDR What seems to be ...?
10 10 38 20 CMP Hey, what do you ...?
10 10 38 25 CDR Yes. Yes, ...
10 10 38 44 CDR ...
10 10 38 45 CMP ...
10 10 38 48 CDR ...
10 10 39 30 CMP Yes, I guess the worst thing in the world would be to try to do something like that and not be able to do it.
10 10 39 35 LMP Oh, boy, ...
10 10 39 50 CMP Tired?
10 10 39 52 CDR Yes.
10 10 40 01 CMP Well, I'll tell you, I'm sure glad we got rid of that clothesline operation ...
In fact, it's really a ball, when you get all suited up, get cooled off, and get the hatch open.

Sounds good. Sounds real good.

Oh, it's great.

The Sun would have been some better - It would have been better if it could have been a little bit higher. Because when I went down around the side of the mapping camera, it was pretty dark.

Yes.

Yes.

Boy, I hope the - I hope the TV came out all right.

Yes. ...

Did you? Okay. ...

Got them. Got them.

Okay.

Somehow they got way down in there - -

Well, we didn't lose anything of value out the hatch. ...

Everything's okay.

We lost a spring clip. We lost a paper clip - -

Want me to write?

Where do you want this? In your ...?

Okay. Plus four balls 8, minus three balls 67, plus three balls 54.
Wait a minute; maybe that's 34.

Oh, yes.

Yes.

Oh, you screwed up.

Yes, sir, Bob, you bet you. It sure is beautiful.

You say that sure has been planned for me?

Yes, ...

... The platform gets us home without a midcourse, by golly.

No range error, but pressure's a little low.

Hey, Jim. While you're down there, we need a canister change. Twenty-one into B. Stow 19 in A-4.

Twenty-one. Yes. Twenty should be in A. Get it out of A-4.

No!

... catch it.

That a boy.

Lock her, Dave. You can ...

...

Yes, it is. I think we can ... I hate to use those pulleys.

...

Yes. If you use your own tool.

...
Who stole my ...? (Cough) Boy, ..., didn't I?

What are you doing?

Thank you, Davey.

TIME SKIP

What are you doing there, man?

... Did you find it?

That's better.

... Yes, I wouldn't know the switches on it.

Houston, Apollo 15.

Apollo 15, go.

Hi, Bob; got a presleep checklist for you.

We're ready.

Okay.

Dave, hold on. We got a ...

Okay, 15, we're back with you. We just had a site changeover.

Okay. Crew status is all good; no medication. And I've got the onboard read-outs, if you've got a pencil.

I've got a pencil.

All righty. Starting with BAT C: 37.0, 37.0, 37.0; RCS A is 56, B is 50, 48, and 52. And I
guess everything else has been done, and you should have got your E-memory dump. We pressurized the cabin with the OPS, and when we got to about 57 or 58, the OPS was down to 800. And I reckon that's the size of it.

10 12 21 11 CC Roger, Dave. That sounds like the size of it to us. We copy all that, and there will be no vector update. Ground says your vector is just as good as theirs right now.

10 12 21 21 CDR How about that? Oh, that's pretty good. We got a good navigator.

10 12 21 27 CC And, 15, let's hold a couple of minutes while we check some data on the SIM bay and then we'll go to the MOCR one more time. And we'll be back with you in final status, I hope.

10 12 21 40 CDR (Laughter) Okay, we got - we got time. We're not quite ready to go to bed yet.

10 12 22 04 CDR (Laughter) Bob says, if he - says, okay, let me go around to the MOCR and check it and come back with your final status, I hope.

10 12 22 24 CDR But, you know, they got to old Joe, I can tell. Joe's changed. He's a changed man. They had him, boy.

10 12 22 32 LMP They did?

10 12 22 33 CDR They were all over his ass during that EVA. He was just really humping. That poor fellow - I bet he's exhausted.

10 12 22 49 CDR He probably had so damn many inputs, he didn't know which way to go.

10 12 23 04 CMP ...

10 12 23 08 CDR Huh?

10 12 23 09 CMP ... apart.

10 12 23 14 CDR Oh, he's pretty close to them. That - that group's all tied together pretty well. Yes. It was in
Day 11

pretty good shape. We got all those guys out on
the field trips and sat down and talked to all of
them, and that - that group's pretty well squared
away.

10 12 23 28 CMP ...  
10 12 23 32 CDR No, they're in the back room. And the guy who
really comes up to him is Jerry Griffith.

10 12 23 40 CMP Oh, yes?
10 12 23 41 CDR He's really the experiments officer. But - -
10 12 23 45 LMP Who's Jerry Griffith?
10 12 23 46 CMP Yes. (laughter).
10 12 23 47 LMP ...
10 12 23 48 CMP Yes.
10 12 23 50 CDR And - But it really goes from Gordon Swann through
Griffith to the Flight Director to Joe. And it's -
it's a straight loop because Griffith and Griffin
both understand the problem, so it - it isn't any
big deal. Except that all the other people who
aren't in the loop and don't understand were there -
all the guys up in the back row with their input -
with them.

10 12 24 12 LMP ...
10 12 24 15 CDR Jerry Griffin said he - one of his main problems
was going to be holding the people off behind him -
you know, to let Joe do his job, and I'm sure it
was ... - especially when they can see it all on
the TV. And they're clanked - -

10 12 24 29 LMP They're all there?
10 12 24 30 CDR Yes. They're all clanked up anyway. Then we go
up on top of some big frigging mountain or stand
right next to some big frigging valley, and, you
know, they can't do anything about it; they're all
bunched up like a nickel cigar.
They ... and ...

Yes.

And ...

Yes.
Roger.

It's a quiet morning.

Say again?

It's a quiet morning.

Yes.

Maybe that means that they come from the Sun. Huh?

Hmm.

Very interesting. Or that the window shield's cutting them off.

No, we had the window shields up before.

Did we?

Yes.

Um hum.

Because we had them - the cockpit all dark.

Be dark. Yes.

Yes, that's right. We did. The only difference now is that the Sun's behind --

We're not - we're not pointed at the Sun - Yes. And the Moon's behind us. Some place behind the Sun. Isn't it?

No. No, nobody's behind the Sun to us.

Hey, we - You know, we're not shielded - we're not - Gee, I don't know.

We may not be in orientation in PTC to be looking at the Sun either. Well, that shouldn't make any difference yet. Were we in PTC when we did it before?
... 

Huh?

I think so. Because I remember thinking, "How are they going to figure the attitude?" They'd have to get it off the - the data.

Yes.

Yes, I see. The - the Sun - will soon be behind the Earth, right?

Yes, should be.

So, if the Sun is close to being behind the Earth right now, maybe the Earth will shield it.

Oh, you mean warpage in the pausal tail?

Yes.

That could be. It comes out in a - in a pinwheel fashion.

Although I saw some last night when I went to sleep.

Yes, I did, too.

That's good, Jim. Is that an hour? (Laughter)

(Laughter) Change the sheet.

Wake up, Jim (laughter).

(Laughter) ... Houston (laughter). You're ... --

... --

-- for minutes.

All you got to do is repeat that 10 times now, Jim.

Boy, that was fast.

Maybe we've been desensitized to them.
(Laughter)

Houston, 15. We're still here. It just looks like a quiet morning.

Roger. Glad you're still awake. Keep on looking for the cosmic rays.

Looking as hard as we can.

Absolutely nothing. Very amazing.

Yes.

MARK CDR. Yes, down on the left eye at about 7 o'clock; intensity about 2. Point source of light.

I guess we can get ready then. They're starting to come.

MARK LMP. Flash at 8 o'clock on the periphery; intensity 2.

MARK CDR. It was in the left eye at 6 o'clock at about a third of the way from the center out; intensity 3; point source of light.

You two guys must be shielding me.

MARK CDR. It was in the left eye about 2 o'clock; a quarter of the way in; intensity 1; point source. Yes, we're taking it all for you, Al.

You must be.

I think Dave's imagining all these.

Got to do something for the ... --

... he's gotten to the point where he's conjuring them up on me.

Dedicating my imagination to science.

Right. Protecting all those who go after you.
Wait until you see how many I'm going to see in the last minute (laughter).

Confound that curve.

MARK CMP.

Yay!

Left eye; dead center; intensity 2; point source. Only ones I can see are the ones that hit me right between the eyes like a ...

MARK CMP. Right eye; about 1 o'clock; 2/3rds of the way out; intensity 2; and a little streaking - some towards the center of the eye - about another third of the way down.

Do you have your eyelids closed?

MARK CMP. Two flashes: one at 9 o'clock in the left eye and one at 6 o'clock in the left eye; both intensity 3. Yes, my eyes are closed, Jim.

Your eyelids are closed.

Yes. Me, too.

Your eyelids aren't going to stop anything.

Don't think so. Just want to get consistent data.

MARK LMP. Flash; one at 4 o'clock, halfway out; another one at 2 o'clock on the periphery; intensity 3.

MARK CMP. Two o'clock; almost on the periphery; and intensity between 3 and 4. Bright one.

MARK CMP. Two o'clock; streak from right to left; centered about the 2 o'clock radial; about halfway out; intensity 2.

MARK LMP. It was a streak; right eye; moving from the top down toward the bottom, intensity 4.

Maybe we get adapted to it.
11 01 19 52 CMP  
Hmm! I suppose so.

11 01 19 55 CDR  
You build up an immunity.

11 01 19 56 CMP  
Mm-hmm.

11 01 19 57 CDR  
Or maybe it's destroyed so many brain cells we don't have any ... left for it.

11 01 20 00 CMP  
You know, that's right. Maybe that's it. Mmm. Our sensitivity is so dulled --

11 01 20 05 CDR  
Yes.

11 01 20 06 CMP  
-- that we just don't see them anymore.

11 01 20 07 CDR  
A lot of people would probably agree with that.

11 01 20 09 CMP  
Yes (laughter).

11 01 20 10 LMP  
Mmm-hmm.

11 01 20 12 CDR  
That's why we're doing them to begin with. Because people are worried about that, I guess.

11 01 20 19 LMP  
Well, I wonder if we're the same distance on the trajectory as we were when we did it on the way out?

11 01 20 24 CDR  
(Yawn) I don't know.

11 01 20 25 LMP  
Is that the idea — to be in the same spatial relation? Yes, we could look --

11 01 20 29 CMP  
MARK CMP. Right eye; dead center; point source; intensity B.

11 01 20 38 LMP  
We could look at the Flight Plan when we get through. The distances are in there.

11 01 20 44 CMP  
Mm-hmm. Yes. We could always figure it out.

11 01 21 11 LMP  
MARK LMP. It was a streak; left eye; top to bottom; intensity 2; it was right at the periphery.

11 01 22 03 LMP  
MARK LMP. Again it was a streak; it was — appeared to be in both eyes; moving from 1 o'clock toward the center; intensity 3.

CONFIDENTIAL
11 01 22 27 LMP  MARK LMP. A flash; 2 o'clock; periphery; intensity 2.

11 01 23 27 CMP  MARK CMP. Right eye; 11 o'clock; about halfway out; point source; intensity 3.

11 01 26 06 CMP  MARK CMP. Left eye; about 10 o'clock, 2/3rds of the way out; point source; intensity 3.

11 01 28 49 LMP  MARK LMP. Flash; position 2 on the periphery; right eye; intensity 2.

11 01 28 58 LMP  MARK LMP. Same position; intensity 4; flash.

TIME SKIP

11 03 14 09 CC  Roger.

11 03 14 11 CDR  And on top of A-2, we have the ISA decontam bag, for 64 pounds.

11 03 14 23 CC  We copy.

11 03 14 25 CDR  Okay. A-3, A-4, A-5, and A-6 - as you have on your list right now.

11 03 14 34 CC  We copy.

11 03 14 36 CDR  A-7 is as you have on your list, with an addition of the LM DAC and the LM 70-millimeter camera that failed on the surface, which we thought you might like to take a look at it.

11 03 14 51 CC  All right, both those are - are added items, I take it?

11 03 14 54 CDR  That's correct.

11 03 15 04 CC  We copy.

11 03 15 06 CDR  Inside of A-7 is the EVA umbilical and bag as p - p - prescribed.

11 03 15 14 CC  Roger.
Top of A-7 is sample collection bag - Oh, stand by. Oh, shoot, we didn't scratch this out. Dad gum it.

What's that?

You don't - On top of A-1, we don't have number 2. We moved it over here to top of A-7. We've got the LM items, right? Only. Just the LM items on top of the - -

Yes.

-- of - of A-1? That's right. Okay, let me - let me go back and make a correction here, Karl. Look over in the left-hand column where it says top of A-1, and scratch "Sample collection bag number 2."

Okay.

And then go back to your right-hand column there. On top of A-7, we have a - a decontam bag with sample collection bag number 2 and the BSLSS bag, for a total of 48 pounds.

We copy.

Okay. The 35-millimeter bracket in the bag, we're going to put that in the - -

-- I clarify that - both of those bags --

That's going to go in there.

-- together were 48 pounds, or do I also put over the 20 - the 23 pounds we had on A-1?

No, the total of collection bag number 2 plus the BSLSS is 48 pounds.

I understand.

And you can scratch the collection bag number 2 for 23 off of A-1.

Roger.

Okay. And then, in A-8, it's stowed as pre - -
to have some wet packs. I think I'll finish what I have, and then I still - Yes, I'll hit the wet packs.

You got 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 wet packs. Hey, we're in -

That's enough to keep us alive.

Oh, yes.

Do we have - How many deals do we have to mark? Two?

Just two. Let me stick that in there, too.

Great. I think, just to clean this place out a little bit, I'm going to take some of these bacon squares and throw them.

Yes (laughter). It's probably a good idea.

As a matter of fact, we could consolidate a lot of this stuff.

Yes.

We could use these bags for garbage bags.

Yes.

You dropped yours.

God damn! Dropped it on the floor. Lord a'mighty.

Get what you want?

Yes.

Oh, a little spaghetti. I had some for breakfast; it wasn't bad. A vast spectrum.

Two meals tomorrow, breakfast, and two more meals today -

One - two - Uh-oh, we'll have to eat - to eat fast, to eat it all up.
No, I don't think so (laughter). I think we're going to be there.

Do you guys think --

We've got 10 wet packs.

Ten wet packs, huh?

Yes, one for lunch, one for dinner, and one for tomorrow.

Want a wet pack, Jimmy?

Yes, I'll probably take one as long as you got them out.

Anybody tried the beef stew?

Yes, I have a beef stew here.

Mine was pretty good.

I'll try one.

You want to try one?

Yes.

Pretty interesting.

Have a wet pack.

Okay.

... get the drinks out here.

And right now you got a P52.

Oh, really.

Just to stir you up a little bit.

Okay. Here's the beverage.

Okay. What kind of beverage do you want here, Dave?
I can't take anything but water, grape, and cocoa. I'm through with that other stuff. Somebody ought to ---

There's one grape left.

Well, you can have it.

Getting lucky.

I don't care. I'll just drink water.

Oh, I - I'd like the grape, too.

I can't take any more. I've had 21 days of those juices, and that's all I can handle.

Yes. I'm with you, pal. I feel that way about a lot of this stuff. Well, what do you want to drink, Al? Did you get your drink?

No, not yet.

Do you want an orange?

Yes, I don't guess there's any pineapple left, is there?

There's a pineapple-orange.

Is there a pineapple-orange in there?

Yes.

Yes, that's what I'd like.

No, I take that back. There's an orange-grapefruit. There's no - no pineapple. What's your choice?

Oh, I'll have an orange.

Okay.

Is that P52 due now?

Yes.
Okay. Jim, put these back.

TIME SKIP

Apollo 15, this is Houston. We'd like to have you retract the mass spectrometer boom for 85 seconds.

Understand. Retract the mass spec boom for 85 seconds.

Yes, I will. Soon as I get the door closed here.

Roger. Get you ... then.

That's affirm, and then you'll leave it there for about 5 minutes. We'll cue you when to extend it again.

Okay.

Okay, retracting now.

... 

Huh?

Screwed up.

Your stuff.

This the way it goes in?

Yes, it's getting a little tricky. Ought to get that thing in there, though.

Does it go in all the way?

Yes, put it in.

Yes.

...

That's funny. Looks like it fits in there pretty well. Oh, what's in - Okay. You're going to put the camera on anyway.
Got ... we can start.

Yes.

Okay.

Okay, we're starting. NOUN 35. Starting now.

Guess we might as well maneuver, huh?

I don't know. Why do you want to go early?

Why not? There's nothing in - the Flight Plan ... Nothing in here ... that I can see.

Well, how about - explain this.

Gamma ray gain. Got to be there by --

Not until 50 - 30 minutes from now.

Yes, that's right.

I guess we're going to dim the lights and do all this on time. Rather sit for - we can get a flashlight out.

... 

Well, we'll see. One minute. Let's see. I don't know why - cabin lights are not going to affect it anyway with that cover over it.

... 

Says we're supposed to use the PCM cable. How can we shoot - that PCM cable for the 250? The EL? It won't reach this window, will it? And we'll have the Nikon in the other window.

Didn't we have that this morning?

Well, it's ruined the other things, Dave. That's for the sextant photos.

(Sneeze)

Solid 24 minutes of activity, isn't it?
We got MAG N on there. And I still have a MAG way back here with a - color - Q. They suggested T, but -

(Yawn)

... Q ...

Might as well.

...

I'll look in this TSB over here.

Look in - in U-1 back there.

...

Roger. You messed up 190 ... --

15, this is Houston. Would you please extend the mass spec boom all the way out again?

Tell him yes.

Roger. In work.

And I have a T-start for the lunar eclipse photos when you're ready to copy.

Okay. Go ahead with T-start?

T-start for lunar eclipse photos, 268:59:47.

Understand 268:59:47.

That's correct, Al.

Yes, my camera's still up here, Dave.

Okay, good.

Hey, we're going to have to rush.


Okay, 59, 47, ...
How long is that from now?

Three minutes.

Well, why don't we go ahead to U - Why don't you go - - 

Al, we had a question on the mass spectrometer, and it may be too late. Was it possible to confirm by visual look through the window that it was retracted?

Negative, Karl. You can't determine that it's retracted. All you can determine is that it's full out.

Roger. Well, when it was retracted, you wouldn't be able to see it; that's what I'm asking. Is it possible for you to take a look now and see if it slowly comes into view?

You want - - 

Okay, he wants you to watch and see if it does come full out.

Roger. In other words, you're asking to confirm that it does come full out.

All right, - - 

That's correct.

- - look down - -

Okay.

- - and if you can't see it, it was retracted. If you can see - You can't see it then.

Yes.

... 

Sure I can. Okay, Jim, I'll go ahead maneuver you. You're the act again.
Okay.

Let's see a Flight Plan.

Well, if we can't find that other MAG, Al, we might have to use this one. Got the one MAG here of black and white from the IM. It has got to be --

Just to clarify --

-- very high speed.

-- our question, Al, the main question was just to confirm whether or not it did go out of your field of view. Did it actually move from full - from the full-extended position? Al, since you saw no change in the data when you retracted it during the test yesterday, there is a suspicion that, even though you actuated the switch, that for some reason it didn't retract.

Understand.

I see - there's one boom extended.

Okay. It's fully extended now, Karl. But it may be too late. It may have already been out by the time we looked. Is that talkback barber pole or gray?

Gray.

Yes.

It kind of oscillates back and forth, doesn't it?

Karl doesn't realize we don't want to get too much UV. He must think we watch out that window every time we extend and retract it.

Hmm.

Yes, no kidding.

TIME SKIP
11 06 08 35 CMP Percentage on the MAG?
11 06 08 39 LMP Okay.
11 06 08 40 CDR Trim and call it 75.
11 06 08 44 LMP Okay, we're moving. Stable DAC. G&N POWER coming back to AC 1. CMC MODE, AUTO, Dave? A VERB 49 maneuver to the lunar-eclipse attitude. I wonder - I guess we better be in that attitude - for the press conference. Okay. You ready -
11 06 09 10 CC 15, Houston. We'd like to get the HIGH GAIN up, PITCH, 22; YAW, 261.
11 06 09 17 LMP Say, buddy!
11 06 09 21 CMP Stand by; we're maneuvering.
11 06 09 25 CDR The numbers, Jim.
11 06 09 26 LMP Okay; 040, plus 011, plus 041.
11 06 09 42 CDR Forty, 11, and 41. Right?
11 06 09 44 LMP That's right.
11 06 09 54 CDR What time's the chronometer say?
11 06 09 55 LMP Twenty after.
11 06 09 58 CMP Yes.
11 06 10 03 CDR Okay, Houston. Are your high gain angles for the sextant photos or for the lunar-eclipse-photo attitude?
11 06 10 14 CC Sorry about that, Dave. When you complete this maneuver, they're in your Flight Plan, PITCH, minus 22; YAW, 227.
11 06 10 21 CDR Roger.
11 06 12 03 CDR Oh, yes. That's not bad. Not a bad picture. Oops!
11 06 12 18 CC 15, we'd like to have OMNI Bravo.
11 06 12 23  CDR  Can you get that for him, Jim?  OMNI Bravo?
11 06 12 26  LMP  Oh.
11 06 12 27  CMP  I'll get it.  --
11 06 12 28  LMP  OMNI Bravo.
11 06 12 29  CMP  ...  Okay.
11 06 12 40  CDR  It's looking up.
11 06 12 46  CMP  Let's see --
11 06 12 47  CDR  Wait.
11 06 12 49  CMP  Yes, let me get it.
11 06 12 53  CDR  What say to open all the windows and get a little light in here, huh?
11 06 12 58  CMP  Yes.
11 06 13 09  CDR  There seem to be --  Ah, there won't be any at the lunar-eclipse attitude, though.
11 06 13 32  LMP  Turn all the floods up all the way.
11 06 13 34  CDR  Yes.
11 06 13 52  CMP  What time's ...?
11 06 13 54  CDR  In a few minutes.
11 06 13 59  LMP  Yes, at 20 after.
11 06 14 00  CDR  Yes.
11 06 14 11  CDR  One guy here.
11 06 14 13  LMP  Let's see if this controller wants to take up.
11 06 14 17  CDR  One guy here.  Here, I got it, Jim.  Why don't you come on down?
11 06 14 25  LMP  Come down now?
11 06 14 26  CMP  Yes. Sit on my urine hose. Keep the --  
11 06 14 28  CDR  Sit on urine hose and keep it down. The controller, we can stick under the couch - for now. This moose is in the way.  
11 06 14 47  CMP  (Laughter) Too much gravity.  
11 06 14 50  CDR  Get over in the - put your feet on the couch and sit down.  
11 06 14 53  CMP  Well, someone's going to have to get up and get the switch.  
11 06 14 54  CDR  What switch?  
11 06 14 55  CMP  SCIENCE --  
11 06 14 56  CDR  I'll get it.  
11 06 14 57  CMP  -- TV switch.  
11 06 14 58  CDR  Yes, it's got to go TRANSMIT on the TV.  
11 06 15 00  CMP  Yes.  
11 06 15 02  CDR  Let's see if this all is going to work. No, we've got to shift it over - away from the corner. Yes, okay. Hold on to that.  
11 06 15 27  LMP  Okay, it looks like we're in attitude. Al?  
11 06 15 30  CMP  Right.  
11 06 15 31  LMP  And we got to get the high gain going there.  
11 06 15 33  CDR  Okay. It's not in the press con - shoo - it's not in here.  
11 06 15 45  CMP  It's in there for the - the maneuver to the - yes, the eclipse attitude.  
11 06 16 00  CDR  Let's see, you ought to try and move those hoses somewhere, Jim. Because you're going to end up having to be further back in the corner, I think. This thing needs to come - Great. I don't - Why don't you come - You get down --
11 06 16 18 LMP  What's wrong?
11 06 16 20 CDR  Taped right now, but I think --
11 06 16 21 CMP  Yes.
11 06 16 22 CDR  Yes, it needs to come over this way more. It's not going to go any further on the other side of the bulkhead there.
11 06 16 35 LMP  Yes.
11 06 16 36 CDR  See, because I'm - I'm in the far - no. Jim, can you get down? And let's see how it's going to work.
11 06 16 40 CC   15, Houston. Give us AUTO and NARROW on the HIGH GAIN, please.
11 06 16 44 CDR  Whew!
11 06 16 45 LMP  Roger. AUTO and NARROW.
11 06 16 46 CMP  You want the front end to come this way a little? You want the front end to come this way?
11 06 16 56 CDR  No, I guess it's all right, if I can - It - it - There.
11 06 20 00 CDR  It's reflected. I mean there's not -
11 06 20 01 CMP  Yes, that's what I made it for. Pick up behind here. No, right behind here.
11 06 20 08 CDR  Tell you one thing. I hope we can turn the lights up.
11 06 20 10 CMP  Yes. Might help.
11 06 20 12 CDR  Lights all up?
11 06 20 13 CMP  Yes. Oh, put it up it.
11 06 20 18 CDR  Al, you take that little bit and we'll put it on the patch.
11 06 20 21 CMP  Okay.
Okay. Yes, that's fine. How's that?

You got it, Jim. Fix it (laughter).

You see a patch, Al?

Yes.

Okay.

Okay, there you go.

No, I don't want it.

See there? It's going to be hitting it. By gads, I'll just hold it on the patch.

(Laughter) Maybe.

I'm in charge of light - light - light effect there --

Light, yes.

-- on the patch.

Light my own.

You want me to turn it on at the right time, Bob?

(Laughter)

Huh?

(Laughter)

No, I think that's all right. There. Maybe you ought to come over this way a little bit. You're up there, like you're hiding in a corner.

There you go.

There. No, I don't think you need that on the patch, do you?

No.
11 06 21 26  CDR  You still got to look at the stupid camera.
11 06 21 27  CMP   No, it doesn't - shows my face up there.
11 06 21 31  LMP   What do you mean?
11 06 21 32  CDR   Okay.
11 06 21 34  CMP   We'll keep it available in case somebody wants to
                   look at my face (laughter).
11 06 21 39  CDR   Okay. Houston; 15. You ready down there?
11 06 21 50  LMP   Well, it's in TV already. Who put it in TV?
11 06 21 53  CC    Roger, 15 --
11 06 21 54  CMP   I put it in TV.
11 06 21 55  CC    -- We're close to ready. Are you ready for a
                   big press conference?
11 06 21 57  CMP   That goes TRANSMIT.
11 06 21 58  CDR   Oh, Roger. We're ready. Any time you want to
                   go to TRANSMIT, let us know.
11 06 22 06  CC    Okay, you can go ahead to TRANSMIT.
11 06 22 09  CDR   Roger. We are. I got 3 seconds, 2 seconds,
                   1 second. How's that? There.
11 06 22 19  CMP   Except for - move your wire, Jim.
11 06 22 22  CDR   That a boy, now. See? They get it all. Okay,
                   Houston, talk to us. We're all here. Except
                   how does it --
11 06 22 32  CC    Hey, 15, we're getting a beautiful picture coming
                   through.
11 06 22 34  CDR   Yes.
11 06 22 36  CMP   Very good.
11 06 22 37  CDR   Roger. Go ahead with your questions.
11 06 22 45  CDR   It's probably blank as hell.
Roger. We'll - we'll admire the beautiful picture for - for a few minutes here.

... this one.

... lens?

Yes, that's been done.

Deke just passed out from the shock, incidentally.

Do we look that scroungy? (Laughter)

Yes - yes. No, we look so good.

(Laughter)

Mmm!

He probably can't believe it.

Yes.

It's just because we haven't shaved in 2 weeks.

Is that a fact?

Yes.

Okay, fellows, I have a preliminary statement to make here. The questions you will be asked in this news conference have been submitted by newsmen here at the Manned Spacecraft Center who've been covering the flight. Some of the questions they raised have been answered in your communications with - with Mission Control, but the public at large has not necessarily heard them. The questions are being read to you exactly as submitted by the newsmen and in an order of priority specified by them.

Hum.

Question number 1. Since last week, we have shared scores of exciting moments with you. Which single moment would you most like to live again, and is there any moment which you would never like to repeat?
Well, I guess we all probably have a different idea on which would be the single most exciting moment of the flight, and maybe we'll just run through it one at a time. I guess the most impressive moment I can remember is standing up on Hadley Mountain - Hadley Delta, and looking back at the plain and seeing the LM and the rille and Mount Hadley, and the whole big picture in one - one swoop. And I think we've got some pictures for you from up there, and I believe the TV was running at the same time, and I think that was probably the most impressive sight that I've ever seen. Al?

I guess I'd have to say - sort of, two events occurred which were exciting for different reasons, and I guess they were really kind of the highlights of - of the flight for me. One was right after LOI, when we got our first look at the Moon, and it was a fantastic, spectacular sight. And the other, I guess, was when TEI burned so beautifully, and right after TEI, that was an awfully good feeling.

Okay. Well, I guess there were a great many new thrills for me, and the one that was most impressive, though, was the lift-off. It began the flight, and I knew that I was going into space after a - a few years of waiting and training. And then, as far as the event that I would not like to - to repeat again, was probably the - the time when I fell down in front of the TV when we were deploying the Rover.

Let me get your mike.

Question number 2. Near Spur Crater, you found what may be Genesis Rock, the oldest yet collected on the Moon. Tell us more about it.

Well, I think the one you're referring to was what we felt was almost entirely plagioclase or perhaps anorthosite. And it was a small fragment sitting on top of a - a dark brown larger fragment, almost like on a pedestal. And Jim and I were both quite impressed with the fact that it - it was there, apparently waiting for us. And we had hoped to find more of it, and, I'm sure, had we more time at that site, we would have been able to find more. But I think this one rock, if it is, in fact, the
beginning of the Moon, will tell us an awful lot. And we'll leave it up to the experts to analyze it, when we get back, to determine its origin.

Question number 3. Apollo 15 is already being described as one of the great events in the history of science. Aside from the crystalline rock, what other findings at Hadley-Apennine seem most important to you?

Jim? Why don't you answer that?

Well, I guess that, immediately, I think of the - the orientation or organization that was revealed in the side of Mount Hadley. There's 14,000 feet vertical relief of vast mountain face exposed to us. And there was layering in there that was most impressive for the total 14,000 feet, and we commented on the number of beds we could see. That really impressed me, that you could have that much organization in - on a large mountain on the Moon.

Question number 4. This is the toughest landing area we have attempted to - to reach on the Moon. Describe what it was like, flying into it.

Well, I think, to begin with, we had every confidence that we could get to the landing site. The trajectory had been modified such that we had adequate clearance over the mountains. And the first sight I had out the window was somewhere around probably 9 or 10,000 feet as we passed down below the upper elevations of Mount Hadley. And I could see Mount Hadley to my left before we pitch - pitched over and saw the - the plain at Hadley, and that was probably as impressive sight - a sight as I've seen. The landing itself, once we pitched over, was somewhat of a surprise in that the - the cratering was much more subtle that we had expected. There was a great lack of any large fragments or boulders on the surface. It was apparently quite smooth, and those rather deep craters, which we - we had anticipated using as landmarks because of their subtlety, did not appear quite as readily as we had hoped. I think we did recognize our relative position east-west.
of the rille because of the size of the rille itself. I think we were a little off on the north-south, but close enough to handle the traverses in the Rover. And I think that having a vehicle such as that - as that enables us to go into more complicated, difficult landing areas, because it's not necessary to land on an exact point. We can take advantage of our mobility and land anywhere within a certain prescribed area, which was initially our goal on this flight.

11 06 29 39 CC Question number 5 for Al Worden. In lunar orbit, you, too, carried out geologic observations; for example, you reported cinder cones. Could you discuss this and other observations from 60 miles up?

11 06 29 54 CMP Yes. The comment on the cinder cones was one of color, but we noticed particularly on - on some of the lighter part of the back side that many, many of the craters that we - that we flew over were filled with what appeared to be lava. There seemed to be a great number of lava flows in the - in the mare area, particularly Mare Imbrium. Mare Imbrium seems to be a - just a - countless numbers of - of lava flows, which were all apparently very thin and - and very fluid. And you can see - you can just count number - numbers of flow fronts covering Mare Imbrium. So we got, I think, quite a distinct impression of a - of a - of a great deal of volcanism around the Moon. And, in some particular isolated area, such as the Littrow area and such as areas like probably the Aristarchus Plateau, there's a great deal of volcanism and some cinder cones and - and certainly a lot of lava flows.

11 06 31 06 CC Question number 6. Do you feel that the workload during your three lunar-surface excursions was too demanding? You appeared at times to be reaching the limit of your endurance. Any recommendations for Apollo 16?

11 06 31 23 CDR I think any time you set out on a task such as the one we had, you're bound to, at certain times, get a little tired, which I think we probably did. However, I - I think we came back and I don't think
we ever reached anywhere near the limit of our physical endurance. I think Apollo 16 probably has everything in hand; it's just a matter of conditioning yourself. Jim and I have discussed it since we got back on board the Endeavour and concluded that our training is what really prepared us, and the many hours we spent during geology field trips and in simulations at the Cape in our suits, we feel, was a factor which really contributed to being able to proceed with those duration EVAs. I see no problem in the future with conducting three successive 7-hour EVAs. Neither one of us were particularly physically tired. I think the fatigue is really in the - the mental regime, in which you're concentrating very intensely for 7 hours, and you're pressing to do your best all the way through and - and keep your eyes open to make the appropriate observations and gather the samples. And I think it's really more of a mental factor than a physical factor.

11 06 32 50 CC Question number 7. You described the Lunar Rover as a bucking bronco on the Moon. Would you elaborate and assess the Rover's performance and tell us what changes you recommend for the 1972 model?

11 06 33 04 CDR (Laughter) Jim, you want to talk about that? Why don't you go ahead? Not too hard, though (laughter).

11 06 33 12 LMP Well, there were several times there when we were riding along where we'd hit a - a sizable bump and you could - you could see the - the wheels come off the ground and then float through the air and - But Dave should comment more as far as the - the driving. And it was really like a bucking bronco, that's true, because I was strapped in. As you know, Dave had to strap me in because I had some trouble with my seatbelt, but I - I really did feel like I was on a - a bucking bronco.

11 06 33 41 CDR I think I might add that it's a - it's a very stable machine, but because of the - the 1/6th gravity, it tends to float. In - in the simulations we ran in Houston, we saw the same amplitude or the same degree of bouncing but a different damping. In other words, the - the vehicle would
come off the ground, or one wheel normally would come off the ground, and it would take it somewhat longer to return to the ground than in one g. And I think it's just a matter of being - becoming accustomed to the - to driving. It's a very stable vehicle; the suspension system - system is excellent. We had to make some rather sharp avoidance turns periodically, and in - in these turns, we could tell the vehicle was quite stable. No tendency to turn over whatsoever. I think the only recommendation we'd really have would be to come up with a new idea on a seatbelt-type arrangement, and we - we've discussed that also. I think we have some suggestions we could make when we get back to ensure that you can have both crewmen securely in their seats in a short period of time. Other than that, I think the vehicle is about as optimum as you can build.

11 06 35 02 CC

Question number 8 for Dave Scott. The drill seemed to drive you up the crater walls. What was the problem, and was it worth the time?

11 06 35 13 CDR

I guess I'd anticipated that question. I think the problem was a - a striking discovery. When we went to Hadley Rille, we expected to find a regolith, or the soil, about 5 meters thick. And with that in mind, like 25 feet, I expected to have no trouble putting the heat flow probes in or drilling the - the core stem because of the expected soft soil. After about 1 meter, I ran into hard rock, and my first thought was it was an isolated rock somewhere within the - the soil. But that was not the case. Apparently, what we have is a very thin regolith or a thin soil layer above solid rock. And with this in mind, I think we brought back a core stem or a deep drill-core of the Moon of basic bedrock or foundation rock on the Hadley Plain. I think that's a very significant find. I think it will be very meaningful to the scientists when they analyze it. The perplexing problem was doing the actual drilling and extracting the core stem. If you put a drill into solid rock, it's very difficult to get it out. And there at the end, it took both Jim and I with our shoulders, pushing as hard as we could, up, to extract the drill stem. But, in the final analysis, as I look back on it, I think it is indeed worthwhile. At
the - at the time it occurred, we were both interested in moving out to the - the Northern Complex and further geology, which Jim and I are both quite interested in. And the mechanical task of doing the drill at that time seemed what - somewhat less important than seeking new - new finds in a new geological area. But, in retrospect, I think we have, in fact, brought back one of the most significant samples of the whole trip.

11 06 37 15 CC  Question number 9 for Dave Scott.

11 06 37 17 CDR  Gee, I don't want them all.

11 06 37 18 CC  In view of your comment to geologist Leon Silver about the need for trained scientists on the Moon, do you think that Scientist-Astronaut Jack Schmitt should be included in the crew of Apollo 17, the last of the Apollos?

11 06 37 32 CDR  Okay. Well, since I really had very little say-so as to which - which people get selected for which crews, I might sort of bypass it with the - with the one comment that I think the more qualified a man is on the Moon, the more results you're going to get. And I think that's one of the reasons that we put as much time as we did into the geological aspects, in hopes of - of learning enough to bring back some significant data. I think that, in any situation such as this, in any scientific endeavor, that you want the most qualified people possible. You must also remember that this is a - a highly complex operational mission. It requires a great deal of - of training and skill in order to fly these machines. I think, in particular, Jack Schmitt - Schmitt is a very highly qualified individual in both aspects. And I believe it's up to the - the management, that when they select the crews, to select the best people for the flight. That all right?

11 06 38 42 CC  -- Al Worden. What runs through the mind of a man orbiting the Moon alone?

11 06 38 51 CMP  Well, I guess - I guess the - the thing foremost in my mind during those 3 days was how I was going to keep up with the time line and the Flight Plan,
and how I was going to keep track of all the experiments we had going and where they were, and whether they were operating or not. And I guess that was a very, very fast 3 days for me. When I wasn't looking at the SIM bay experiments, I was looking out a window and taking pictures, and it was a pretty crammed 3 days. As a matter of fact, I - I guess I didn't really have - have much time to give any thoughts to being alone out there.

Question number 11, again for Al. You said, after your spacewalk, you wish you'd stayed out longer. What was it like out there between the Earth and the Moon, and why did you come in so soon?

Well, let me answer the last one first. I - I guess I didn't come in soon; I came in when the job was done. And, as a matter of fact, I made an extra trip back out to take a look at the mapping camera. Now as - as far as what I felt like when I went out there, we talked a little bit about it after - after the EVA and decided it was sort of like walking on stage at your high school - dinner dance or something. We opened the hatch and it was pitch black, and as soon as we got out, the Sun was beating down on everything, and it looked like a very large floodlight on a stage. And then putting the TV camera out on the door just added a little bit more to that sort of unreal feeling that it was time to get out on the stage and do something. I think, as far as the EVA went, we - we did it just almost exactly as we'd practiced it. It took almost exactly the same amount of time; we did it the same way. And, of course, we had practiced out with the pan - with the mapping camera in the extended position, and so that - that really posed no difficulty to us.

Question number 12 for Dave and Jim. You - you didn't have time to get to North Complex, craters which may have been formed volcanically and where you thought some surprises might be found. Was this a significant loss?

Why don't you?
Well, I'll start out and - and throw an answer there. I think if you look back at the original requirements for the landing at the Hadley-Apennines, they were primarily to inspect the Front and the rille. It was only after a considerable amount of study had been done and some rearrangement in the Flight Plan - the timing on the surface, that we found we had enough time to plan to go to the Northern Complex. So the Northern Complex was, in fact, an addition to the original requirement; it was a bonus. And I think, because Jim and I have spent so much time with volcanics in our terrestrial geology work, that we were quite interested in getting to the Northern Complex to see if, in fact, it was a volcanic area. But I don't believe we lost anything from the lunar surface by not going there; only we would have had an extra - a bonus had we been able to reach that point. And, with that in mind, I hope that someday somebody gets a chance to go back and take a look at the Northern Complex. Jim, you want to answer?

No, I agree with everything you said. It was just a little personal disappointment that we couldn't get up there, because we - we thought we'd have another beautiful view of the - the plains there and the LM, a view almost -

(Sneeze)

- as beautiful as it - as it was from the side of Hadley Delta.

Question number 13 for each of you. Would you, please, in your own words, tell us what you gave the American taxpayers besides a few hours of good television?

(Laughter) Well, I think - the magnitude of the scientific data we've returned will speak for the taxpayers' money. The small amount of time they had for television, I think, is rather insignificant relative to the amount of return we've gathered in the SIM bay and in the lunar samples we have aboard right now. I think these data will not only enhance the progress of science, but it'll reach the common man on the street.
directly by the - the byproducts of what we learn. I think man must extend himself, that new frontiers must be opened in order for us to - to propagate mankind, and I think this is one way in which we do it. I - I feel that the taxpayers got, probably - as a matter of fact, I hope they got more than their money's worth out of the flight. And, if you could see the size of the - the film magazines that Al brought in yesterday from those cameras, why, you'd see that we have indeed at - at least a great deal of data on film alone. Want to an-
swer that?

Well, I really guess that - that there's not much more to add to what Dave said. He - he expressed my sentiments exactly, in that the - the knowledge that, hopefully, we've - we've added to our store of information about the Moon and about ourselves will be increased in an extent which is greater than - than the - than the capital that was - spent on the flight itself. And I would certainly think that - that this whole theory adds signifi-
cantly to - to man's knowledge about himself pri-
marily and about himself in those areas where it will help future generations maybe. Jim?

I can only add that we're bringing back just a - a lot of - a lot of data and a log of material, and it's going to take many years for people to really appreciate how much was gained from - from this flight.

Question number 14. It seemed this flight had as many problems as some of the old Gemini missions. Which of these gave you the most concern; and, for Dave, did you ever feel you were back on Gemini VIII?

Well, I guess we weren't aware we had that many problems. I thought this was a rather troublefree flight, myself. We went a long way, we spent a long time doing the job, and I think, relative to the number of systems we have in all the space-
craft, that we had very few problems. I can think of none that were significant that would enable me to compare it with Gemini VIII at all. We had a - I guess the first little problem we had was a - a leak in our water system, which was cleared up rather rapidly by somebody having already done
some investigation and having a procedure at hand. I believe our system is such that people have all the anticipated problems understood, and, when they have them understood, they come up with solutions which are quite meaningful and successful. And I feel like the spacecraft and the life-support systems on the Moon and everything worked exceedingly well. I - I guess really I couldn't ask for much more. How about you?

11 06 46 37 CMP Well, I really don't --

11 06 46 38 CDR No, go ahead.

11 06 46 39 LMP Go ahead. You know, really, we had very few problems. It seemed like a very tame simulation, as far as I was concerned.

11 06 46 47 CMP Certainly, there were - there were - there were irritating things that happened like some circuit breakers in the spacecraft here that gave us some trouble, and some lights that aren't working exactly right. But certainly none of the important aspects of the flight or - or none of the essential pieces of equipment has malfunctioned, and I think it's been just great. Okay, Karl, you take it from there, baby.

11 06 47 19 CC Gentlemen, we'd like to continue the press conference in a few minutes. But, in the meantime, we'd be anxious to get - start - get one of you started on the lunar-eclipse photos.

11 06 47 28 LMP Yes, turn --

11 06 47 29 CDR We got to try to do both?

11 06 47 30 CC -- three more questions.

11 06 47 31 CDR Okay --

11 06 47 32 CC Question 15.

11 06 47 35 LMP Why don't we show them the lunar eclipse?

11 06 47 37 CDR (Laughter)

11 06 47 39 LMP There's a lunar rock to show them.
Day 12

11 06 47 40 CC -- 15 -- for Dave and Jim. How many times did each of you fall down on the lunar surface? Did any of these falls hurt you or give you any problems?

11 06 47 54 CDR Let's think, how many times?

11 06 47 56 LMP Well, I fell down twice --

11 06 47 57 CDR Yes.

11 06 47 58 LMP -- and it was never any real problem. Actually, I could have got up very well by myself without any help.

11 06 48 05 CDR Yes, I guess I fell down twice, too, and, as -- as Jim said, it was never any really problem. It's a matter of, if you start to go -- and, of course, the terrain there, I guess you could see in the television, was quite rough and irregular with occasionally rocks around, and we were pressing to try and get things done. And it was just a matter, if you just start losing your balance, to go ahead and go easy, and accept somewhat of a -- a light fall. Because of the 1/6th gravity, there was never any impact when we hit. Take it easy and get up slow. And I don't think either one of us ever came anywhere near the point of being hurt, in that sense of the matter, it's just a matter of slowing you up for a minute, enabling you to regain your balance, and go ahead. And -- and I have a question. Do you want to have the photos of lunar eclipse with the television now, or do you want us to get on with the -- the camera photos? Because if that's the case, we have to turn the lights out.

11 06 49 13 CC Roger. We're going to skip down to the last question, Dave, which says your cabin must be jammed with Moon rocks, core samples, suits, and assorted hardware. Can you show us what it's like in there? And, as you show us around, you can get set up for the Moon photos and dim the lights when you like.

11 06 49 28 CMP Oh, man.

11 06 49 29 LMP (Laughter) Ohh!
Okay. I guess --

(Laughter)

-- to show you around, we have to unstow everything. We're -- we're pretty well stowed for re-entry right now. We have all the samples stowed, the suits are all stowed, and I guess, in order to show you around, we'd have to do some unstowing because under -- beneath the couches right now, it's jammed full. And I guess we'd like to do that for you, but it's some -- somewhat impractical, in that all you could see would be some -- some edges of the white bags, and that's why we have the room in the cabin here. Every -- everything's pretty well squared away. But, when we get back, I'm sure you'll have an opportunity to see the many things we have, and there's really a lot of it.

0 - okay, Dave. That's fine. And I guess one last request is, when you get over to that window to -- and before you take the photos, could you give us a quick picture of the Moon with the TV camera?

Sure will. Can try it.

(Humming)

Have I got any pictures? I'll cut this thing down.

(Humming)

See any magazines?

Yes --

Right here's some, Dave. I got Al's. You got some? Procedures, cameras -

You ought to get over here.

Let me get over there.

15, the word here is to proceed. Give your photography first priority there, and maybe we can see the -- the Moon out of the other window.

That's ... - -
Okay, we're working on it.

Oh, ...

Got enough?

Hold it, Al. It's still going --

Monitor? Yes, I can get it from here. I think.

15, Houston. We hear that your attitude is very good right now; there's no need to trim the maneuver.

Okay, thank you.

Okay, Al, you got the camera all set up over there, huh?

Yes.

Do you want me to read the settings to you, just in case?

Yes.

There's a change.

Yes.

If you'll grab those ...

What do you want me to get, Dave? Get the lights? Yes, I can get them.

If you can get the lights -

Turn this up a little bit. Okay, Al, when you're ready for me, I'll read to you.

Could that be it?

Need anything down there, Dave?

No, I don't think so. See what it looks like.

Well, it's completely dark now. Just the lower part is orange.
11 06 53 04 CDR Yes.
11 06 53 07 LMP The top part's almost a red, a dark red, and the bottom is an orange.
11 06 53 11 CMP Here.
11 06 53 12 CDR There you go. Yes, you got her. Okay, Houston. I think you have a picture of her now. There she is.
11 06 53 19 CMP Okay.
11 06 53 20 LMP Okay. Let's check it; f/1.2?
11 06 53 23 CMP Yes.
11 06 53 24 LMP 1/500th?
11 06 53 25 CMP Right.
11 06 53 26 LMP Take eight frames? Okay, I guess we'll give priority to you, huh, Al?
11 06 53 30 CDR Okay, we - we got to get the --
11 06 53 32 CC 15, so far we have a blank screen down here.
11 06 53 35 CDR Oh, really? I've got a good picture on the monitor.
11 06 53 41 CMP Okay, Jim, while --
11 06 53 42 CC Hang on for a moment, please.
11 06 53 43 LMP Okay, we're coming up on 6 minutes here at 55 --
11 06 53 47 CMP Besides, we're FREE here.
11 06 53 49 CDR Boy, every time those - the jet fires ...
11 06 53 52 LMP Okay, go - we're FREE.
11 06 53 54 CMP Okay, Jim.
11 06 53 56 CC It's coming through now.
11 06 53 57 CMP Okay, Jim.
Okay, stand by. Your first one'll be a 60-second exposure time and I'll - it'll be at 55:53.

Well, that's kind of - not ...

That's a beautiful picture with just an edge of the Moon coming out of eclipse.

I can do it anyhow.

Can you?

Roger; that's right.

Okay. Suit yourself then. I'm --

TIME SKIP

Anybody else like chicken stew?

Chicken stew, huh? Yes, I do. I didn't know we had any. Is that what you have up there?

Yes.

No, uh-uh.

If you want to eat here, I'll be happy to come down there.

Hey, throw me some beef steak. Well, I guess some turkey and gravy.

Go back where? Yes, man, you aren't kidding.

Thought you wanted to go back to the Moon?

Don't know why.

I'll trade with you, Dave.

All right.

I'll go down there.
Down here?

Yes.

This is our new garbage can down here, huh? Good.

You want to get those readings now, Al, or after supper?

I don't care.

Get them now?

Okay. Start out with 5-C.

5-C reading 4 - 4.2.

All right; 5-D?

3.9.

6-A?

You writing them down?

Yes.

6-A is 4.1.

Okay; 6-B?

4.2.

6-C?

Greater than 5.

No kidding. Huh. Okay --

...

-- 6-D? Houston, 15. Go ahead.

Roger. Remember back aways, we were talking about doing some more mass spec boom tests at 275 hours, which has gone by. We're right now talking about delaying that until 276 hours, approximately, or
at least until before you start your VERB 49 manuevers for the next set of P23s. Over.

11 11 12 21 CMP Okay, fine. 6-D.
11 11 12 26 LMP Is that okay on 6-C, the fact that it's --
11 11 12 28 CMP I don't know; we'll tell them.
11 11 12 30 LMP Okay, 6-D is 45.
11 11 12 36 CMP Okay. And, Houston; 15. I have some command module RCS injector temperatures for you.
11 11 12 44 CC Ready to copy.
11 11 12 46 CMP Okay, these are readings off the SYSTEMS TEST meter: 5-A is 4. - or 5-C is 4.2, 5-D is 3.9; 6-A is 4.1, B is 4.2, C is greater than 5, and D is 4.5.
11 11 13 07 CC Roger. Copy 4.2, 3.9, 4.1, 4.2, greater than, and 4.5.
11 11 13 14 CMP Roger.
11 11 13 30 LMP Here, put it on there, I'll give you a squirt. How many do you want?
11 11 13 37 CDR Is that the soup?
11 11 13 41 CMP Chicken stew.
11 11 13 42 LMP How many do you want?
11 11 13 43 CDR Three of them.
11 11 13 44 LMP Ready?
11 11 13 45 CDR Yes.
11 11 14 01 CDR Shit.
11 11 14 04 LMP Screw it in there?
11 11 14 05 CDR Good.
11 11 14 06 CMP ...
11 11 14 13 CDR  Yes. Roger.
11 11 14 16 CMP    ...
11 11 14 30 LMP    Yes.
11 11 14 39 CDR   Well, we have a lot of drinks for breakfast.
11 11 14 42 LMP   Okay, I ought to change the LiOH. Which one was it, Al?

11 11 14 48 CMP    Okay, 23 to B and 21 to A-5.
11 11 14 52 LMP    Okay, going into B.
11 11 14 54 CMP    23 into B.
11 11 14 56 LMP    Okay.
11 11 16 22 LMP   I wonder if any of this food is - the - the ir-radiated food.
11 11 16 26 CDR  Could be. ...
11 11 16 33 LMP   One way of preserving food these days is to -
11 11 16 37 CDR    ... radiation.
11 11 16 39 LMP    And it preserves it. At certain times, radia-
11 11 18 01 LMP    ... tion preserves it.
11 11 18 03 CDR  Okay. Canister change is complete.
11 11 18 03 CDR  Okay. Very good.
11 11 19 22 CDR    ...
11 11 19 25 LMP  That's wrong, Dave.
11 11 19 27 CDR   ...

TIME SKIP

11 11 30 27 CDR  Al, you going to monitor comm? I'm going to get off the headset here.
Come forward, Al. Thank you very much. ... Just ruined the whole thing.

Oh - damn!

Oh, my God.

Freaking DAC won't come off.

You need one of these, too? That okay?

Okay. Okay.

There you go. Can I get that for you?

Thank you.

Ready for it now?

... Move over some. ...

If I were you, I'd go over to the lab and pick one up out of there - a perfect sample.

They don't have them.

They don't?

No.

Dammit, why don't you buy a set of them? ...

I might buy them.

Yes, but you'd be taking all that guff.

Feast over his favorite rock.

Right.

...

How come?
... On the ball.
... to surprise ...
... 330 ...
(Clears throat) You going to do anything else down there? Are you going to do anything down there? All right.

Well, I've got a P23 to do in 3 minutes, and then we got to ... the daytime. I got to clean up and change my long johns and take my biomed off, while I got the chance.

Okay.
Okay.
Dave, I hope we're going to be able to see them unload all those rocks.
Yes, I think we should.
Okay.
... time ...
I hope so. Yes. They'll just have to hold up the - the rocks until we're there.
... going to have a ball ... Is that why you ...?
Yes.
... mind working some long hours.
How long does the medical take on the ship?
... ship until about what - 6 o'clock tomorrow night? We'll be taking that physical until 10 tomorrow night?

Ten their time is all I know.

Oh, that's right. It's our time, which is -

On board the ship.

Yes. ...

We're all having his.

Man, we're down low. The cupboard's bare. Bacon squares.

I don't know if we have enough in there for two more. Yes, I guess we do.

Yes, you need a reinfo - forced toe section.

I'll take that and get this - Going to use the camera.

Have a 9-hour rest period.

Make sure I'm turned on there, will you, Dave? My power on?
... What? Yes, if you want to dig it out, it's in the - I put it in that bag. Dave, could you get - Dave, could you get - There's a bag in my TSB. One of the white towel bags that has all my gear in it.

Thank you. It's in here, Al.

Apollo 15, Houston. Over.

Go ahead, Bob.

Roger. If one of you fellows has the time, we might like to continue on with the mass spec boom retract test.

Okay. Is it something I should write down, or can I just do it real time?

Give it to you in real time. It's not that complicated, Jim.

Okay. Go ahead.

Okay. We need the EXPERIMENT switch to ON down there in the ALPHA - Excuse me, the MASS SPEC, EXPERIMENT switch to ON; and the ION SOURCE, ON. Over.

Okay. I understand MASS SPEC, EXPERIMENT, ON; and ION SOURCE, ON. Stand by. David, can you get a couple of switches over there? The MASS SPEC, EXPERIMENT, ON; and the ION SOURCE, ON.

Okay, Bob. They're both ON.

Okay. And then next, you go down to the other panel, and we go DEPLOY for 20 seconds on the MASS SPEC BOOM, and then RETRACT for 40 seconds, or until we get a gray indication. Over.

Understand you want DEPLOY for 20 seconds and then - on the MASS SPEC BOOM, and then RETRACT until we get gray or 40 seconds.

Roger. Whichever occurs first.
Okay. Okay, Dave. On that MASS SPEC BOOM, we go DEPLOY for 20 seconds. If you want, I can give you a mark.

That's okay.

They're OFF.

Go to OFF and then I'll have you — and then RETRACT it for 40 seconds —

TIME SKIP

Oh, 6:45 tomorrow.

Yes. ... 

He didn't.

Cabin temp, 67.

... 

Oh, shit.
DAY 13

12 03 56 22 CDR -- NORMAL.
12 03 56 23 LMP TAPE RECORDER's on HIGH BIT RATE. Record the start.
12 03 56 29 CDR Okay. It worked.
12 03 56 32 CMP Yes.
12 03 57 04 CMP 10, 9, 8, 7, 6, 5, 4, 3, 2, 1 -
12 03 57 14 CMP ZERO.
12 03 57 15 LMP ... open.

TIME SKIP

12 06 50 17 LMP Okay, TAPE RECORDER's on HIGH BIT RATE, RECORD, and FORWARD.
12 06 50 25 CDR Here, my friend, is a lunar rock.
12 06 50 28 CMP Yes. Floating around in the space of our spacecraft.
12 06 50 33 CDR Yes. Wonder (laughter) - The sequence of panels we go through is somewhat inane.
12 06 50 41 CMP Oh, it really is, isn't it? God!
12 06 51 13 CMP About 8 minutes.
12 06 51 17 CDR This is the most leisurely entry we've ever done.
12 06 51 19 LMP Yes, I don't understand how - why we have so much time.
12 06 51 21 CMP Stand by. ... fast.
12 06 51 23 CDR It'll go fast.
12 06 51 25 CMP That's because we started 4 hours earlier --
12 06 51 27 SC (Laughter)
12 06 51 28 CMP -- than we normally do.
12 06 51 29 CDR (Laughter) That's true. This is our normal reset burn, right here.
12 06 51 39 CC Apollo 15, Houston. You're looking good. About a minute and a half to handover to ARIA.
12 06 51 45 CDR Roger.
12 06 52 00 CDR Separation really unloosened a bunch of stuff.
12 06 52 04 CMP Yes.
12 06 52 05 LMP See my nut come flying by yet?
12 06 52 07 CDR No (laughter). Nor your screw (laughter).
12 06 52 11 LMP Listen, man, I've got my screw right here.
12 06 52 59 CDR Got your camera all ready, Jim?
12 06 53 01 LMP Ready.
12 06 53 02 CMP Don't forget it.
12 06 53 03 LMP I think I'll turn it on at - probably - Oh, look out the window, and you see ions - ionization.
12 06 53 09 CDR Yes.
12 06 53 15 LMP Probably be just before blackout, I guess. Blackout at PT. Yes. Before zero phase.
12 06 53 55 CMP Looks like 5 minutes.
12 06 53 56 CDR Right on. Time is right on.
12 06 53 58 CMP Great.
12 06 54 00 CDR Can't argue with that.
12 06 54 04 CMP My dynamics - or trajectory's changing somewhere, because that light's coming from a different place now.
12 06 54 52 SC (Sneeze)
Oh, that's the Earth down there, baby.

Can you see it?

Sure as hell can. Yes, sircle, I hope to tell you.

Are we going backwards?

It's big and real.

Yes. I can see it. Just barely see it out of my window.

Yes, we're going backwards.

Encouraging.

Just check the needle on the peg here; 51 and a couple of minutes until we're down.

Is that pausing from minimum impulse?

It sure is. Man, that's just bang, bang. That's really neat.

I keep thinking that, if I hit the stick quick, that minimum impulse will be less (laughter). Did you ever get that feeling?

Yes.

There's just a little bit you want to go --

It's right then.

-- and you try to get it and you can't quite get there. Yes.

Oh, yes. Hey - Oh, man, are we moving, too! Son of a gun! Sheeoo!

Yes, indeedy. You ought to be able to see it out the - out the hatch window.

Oh my, I sure can. Sure a lot of mountains down there. How about that!
12 06 56 36  LMP  Shit, I think that's Alaska out there. That would be right, wouldn't it?
12 06 56 47  CMP  Yes. Keep an eye out for the Moon.
12 06 56 49  CDR  Yes, keep an eye out for the Moon.
12 06 56 50  CMP  We've done it. Oh, we've missed it.
12 06 56 53  CDR  56:37. Oh, Al ---
12 06 56 54  CMP  We were too busy watching the Earth.
12 06 56 55  CDR  --- why don't you pay attention to what you're doing there.
12 06 56 57  CMP  Too busy watching the Earth.
12 06 57 05  CDR  I'm not sure there's much you could do about it any - any - to correct it anyway.
12 06 57 09  CMP  Not at this point. Here comes the needle off the peg. There it goes. Now let me get to 5. Yes, 55.
12 06 57 17  CDR  Okay.
12 06 57 33  CDR  Neat.
12 06 57 34  CMP  Yes.
12 06 57 35  LMP  We just passed south of Alaska.
12 06 57 37  CDR  Did we?
12 06 57 38  LMP  Yes.
12 06 57 41  CDR  Little earlier than usual.
12 06 57 48  CMP  Houston, 15; go ahead.
12 06 58 05  CDR  Okay, the needle's off the peg.
12 06 58 12  CMP  About right.
12 06 58 28  LMP  What a view! Whew!
12 06 58 37  CMP  Okay, we've got about 10 - 20 seconds to entry interface.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
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</thead>
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<td>12 06 58 41</td>
<td>LMP</td>
<td>More than that. Oh, EI, yes. ... I don't think I'm going to like it.</td>
</tr>
<tr>
<td>12 06 58 55</td>
<td>LMP</td>
<td>There's RRT.</td>
</tr>
<tr>
<td>12 06 58 57</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>12 06 59 06</td>
<td>LMP</td>
<td>Getting the ionization?</td>
</tr>
<tr>
<td>12 06 59 08</td>
<td>CDR</td>
<td>Yes, man.</td>
</tr>
<tr>
<td>12 06 59 09</td>
<td>CMP</td>
<td>Put your --</td>
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<tr>
<td>12 06 59 10</td>
<td>CDR</td>
<td>Yes, look at it. Good.</td>
</tr>
<tr>
<td>12 06 59 11</td>
<td>CMP</td>
<td>Yes.</td>
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<tr>
<td>12 06 59 13</td>
<td>CDR</td>
<td>Ionization?</td>
</tr>
<tr>
<td>12 06 59 14</td>
<td>LMP</td>
<td>Everything looks good.</td>
</tr>
<tr>
<td>12 06 59 15</td>
<td>CDR</td>
<td>Boy, I guess.</td>
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<td>12 06 59 16</td>
<td>CMP</td>
<td>.01, .02, 4 -</td>
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<td>12 06 59 25</td>
<td>CMP</td>
<td>.05G light.</td>
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<tr>
<td>12 06 59 26</td>
<td>CDR</td>
<td>Okay, GO. EMS scroll --</td>
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<td>12 06 59 28</td>
<td>LMP</td>
<td>.05G switch --</td>
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<td>12 06 59 29</td>
<td>CDR</td>
<td>EMS good.</td>
</tr>
<tr>
<td>12 06 59 32</td>
<td>LMP</td>
<td>.05G switch, on; EMS ROLL, on.</td>
</tr>
<tr>
<td>12 06 59 34</td>
<td>CDR</td>
<td>They're both on.</td>
</tr>
<tr>
<td>12 06 59 35</td>
<td>LMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>12 06 59 36</td>
<td>CDR</td>
<td>Okay. Okay, .39.</td>
</tr>
<tr>
<td>12 06 59 42</td>
<td>CMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>12 06 59 43</td>
<td>CDR</td>
<td>.5, .1.</td>
</tr>
<tr>
<td>12 06 59 44</td>
<td>LMP</td>
<td>.6.</td>
</tr>
<tr>
<td>12 06 59 46</td>
<td>CDR</td>
<td>.8, 1, 1.3, 2g's, 2g's --</td>
</tr>
</tbody>
</table>
12 06 59 53 CMP Accelerometer and the DSKY.
12 06 59 56 CDR Okay.
12 06 59 57 CMP Scroll look good?
12 06 59 58 CDR/CMP 3g's.
12 07 00 01 CDR Three and a half.
12 07 00 03 CMP 4.
12 07 00 04 CDR There's 4.
12 07 00 05 CMP 5.
12 07 00 07 CDR There's 5, 6 -
12 07 00 13 CMP Scroll looks good.
12 07 00 14 CDR There's 6, 6, 6 there, 6.2. Don't see anything on master alarm.
12 07 00 22 CMP Want the master alarm?
12 07 00 24 CDR Nothing.
12 07 00 25 CMP Huh?
12 07 00 26 CDR Nothing.
12 07 00 27 CMP Okay.
12 07 00 28 CDR 5.6. We roll 180. 5, 4.7 -
12 07 00 37 CMP Looking good.
12 07 00 38 CDR 180 roll, 4, 4.4, 4.2, 4.1. Rolling to 150, 117, 092 - -
12 07 00 52 CMP Okay, looking good.
12 07 00 54 CDR Plus 69, plus 51.
12 07 00 57 CMP Looking good.
12 07 00 58 CDR Plus 49.
12 07 00 59 CMP Okay.
12 07 01 00 CDR "4g's, you're right on."
12 07 01 02 CMP "4g's."
12 07 01 03 CDR Eighty-five, plus 101. Holding 4g's. Lift vector, up.
12 07 01 10 CMP Going up.
12 07 01 11 CDR We're in P67.
12 07 01 12 CMP Good.
12 07 01 18 CDR Okay. Minus 51.
12 07 01 21 CMP Okay.
12 07 01 23 CDR And at 4g's. Minus 110.
12 07 01 31 CMP Okay, we're going in.
12 07 01 34 CDR Minus 116.
12 07 01 35 CMP Okay, 450 miles and that's --
12 07 01 36 CDR Okay.
12 07 01 37 CMP -- right where we are on the scroll.
12 07 01 49 CDR Okay, at 399, we're --
12 07 01 51 CMP Okay, we're off the ...
12 07 01 52 CDR -- almost 3g's. Boy, EMS has missed here within about 5 miles.
12 07 01 55 CMP Yes, we're looking good.
12 07 01 58 CDR Seventy-one, minus 70.
12 07 02 00 CMP EMS is -
12 07 02 04 CDR Minus 70.
12 07 02 19 CMP Pretty good.
12 07 02 20 CDR Yes.
12 07 02 23 CMP Minus 70 - -
12 07 02 24 CDR Okay, there's 3g's.
12 07 02 26 CMP And the scroll shows us right on the range to go.
12 07 02 30 CDR Okay.
12 07 02 34 CMP Couldn't be better.
12 07 02 36 CDR Houston, Apollo 15. We're in P67. The EMS and the G&N agree within 15 miles, and everybody's in good shape.
12 07 02 51 CDR Okay, plus 52.
12 07 02 52 CMP Roger. That's where we are. Still pulling 3g's.
12 07 03 01 CDR Okay, stand by.
12 07 03 04 CMP And we're coming right straight down that scroll. Beautiful.
12 07 03 06 CDR Good. Houston, 15. EMS and G&N agree within about 10 miles, and everybody's in fine shape.
12 07 03 28 CMP There they are.
12 07 03 30 CDR Okay, 32 degrees ...
12 07 03 40 CMP Okay, 98, NOUN 18; boy, that's slick.
12 07 03 43 CDR 10,000 feet per second.
12 07 03 50 CMP My eyes were cocked; 100 miles to go. I'm about 4 miles off; so - Looks like even the scroll's working great.
12 07 03 59 CDR Yes. Great. Hey, now I know why you got to check the tunnel for water.
12 07 04 07 LMP Yes, boy, I guess. Did you get wet?
12 07 04 09 CDR Yes, man. ...
Yes, it really comes barreling out of there, doesn't it? (Laughter)

Okay. ... --

Sixty miles to go. Okay, up.

...? 33 and 46. Boy, they really agree. 6000 ... --

Getting our cross range right now.

Hey, Houston; 15 in the blind. The EMS and G&N agree within about 10 miles.

Gee, what makes you feel - sound so hollow?

Sounds like ... is about to make a low pass on us.

We're coming up to 38. Watch your steam pressure, Jim.

Standing by.

It's 3000.

No steam pressure yet?

It's going up now.

Okay.

Okay, steam pressure's pegged.

Okay, we should get - 50K in about another 600 feet. Got 9 miles to go on EMS.

Okay. Should be getting a NOUN 67 here directly.

Okay, Houston; 15 in the blind. Latitude, plus 26.12; longitude, minus 158.17 --

Okay, we're off the peg.

-- and about a 2.2 off the peg.
12 07 05 56 LMP  Okay, CABIN PRESSURE to BOOST/ENTRY.
12 07 06 00 CMP  BOOST/ENTRY.
12 07 06 01 LMP  SEQUENCE PYRO, two, to ARM.
12 07 06 04 CMP  PYRO to ARM.
12 07 06 07 LMP  Standing by for 30.
12 07 06 09 CDR/CMP  Okay.
12 07 06 11 CMP  We're out of 40.
12 07 06 16 CDR  Okay, Houston; 15. Out of 40K, and we're showing about a .7, .2, this business now. Everybody's in good shape.
12 07 06 27 LMP  How's the altitude, Al?
12 07 06 29 CMP  Coming up on 30.
12 07 06 30 CDR  Okay --
12 07 06 31 CMP  Okay, 30K.
12 07 06 32 LMP  Okay, ELS LOGIC, on.
12 07 06 33 CMP  ELS LOGIC, on.
12 07 06 35 LMP  ELS, AUTO.
12 07 06 36 CMP  AUTO, on.
12 07 06 38 CDR  Okay. Stand by for --
12 07 06 39 LMP  Standing by for drogues at 24. There go the -- there goes the apex. There are the drogues.
12 07 06 50 CMP  Good drogue.
12 07 06 52 LMP  Okay, cabin pressure's increasing.
12 07 06 55 CMP  All right.
12 07 06 58 LMP  Standing by for mains - at 10.
12 07 07 02 CMP  Okay, we're out of 18.
12 07 07 15 CDR  Give us a call when you get to 10.
12 07 07 17 CMP  Well, coming out of 14, 13, out of 12, 11,000.
12 07 07 34 LMP  Okay.
12 07 07 37 SC   (Sigh)
12 07 07 38 LMP  Okay, the mains are up there.
12 07 07 40 CMP  And the mains are out, three.
12 07 07 42 CDR  Okay --
12 07 07 43 CMP  Okay.
12 07 07 44 CDR  -- Apollo 15 has good mains.
12 07 07 45 CMP  The mains are opening.
12 07 07 46 LMP  SURGE TANK O₂, off, Al.
12 07 07 48 CMP  SURGE TANK O₂ coming off.
12 07 07 51 LMP  REPRESS PACKAGE, OFF.
12 07 07 53 CDR  Let's go, Al.
12 07 07 54 CMP  REPRESS, OFF.
12 07 07 57 LMP  DIRECT O₂, OPEN.
12 07 07 58 CMP  DIRECT O₂, OPEN.
12 07 08 02 P    -- the bearing is 130 to - three main chutes. I have visual contact; three main chutes.
12 07 08 08 CMP  -- 8000.
12 07 08 09 OKI  Okinawa, Roger. Out.
12 07 08 10 LMP  -- PRESSURE RELIEF, two, CLOSED.
12 07 08 11 CMP  CLOSED.
12 07 08 13 LMP  CM RCS LOGIC, on, up.
12 07 08 14 CDR  ... 2, Apollo 15. We're showing about a minus .6 --
12 07 08 16 CMP RCS LOGIC, on.
12 07 08 17 CDR -- on the miss distance --
12 07 08 18 LMP CM PROPELLANT to DUMP.
12 07 08 19 CDR -- Everybody's in good shape.
12 07 08 28 R Okinawa, Recovery has a recovery beacon contact, bearing 175 magnetic. On station.
12 07 08 34 OKI Okinawa here.
12 07 08 37 S-2 Okinawa, this is Swim 2. I have a visual contact bearing 010, that's approximately 1 mile. My position, 134; Okinawa 8.5 miles. Altitude is about 6000 feet to the command module.
12 07 08 52 OKI Okinawa, Roger. Out.
12 07 08 58 S-1 Okinawa, this is Swim 1. I have recovery beacon, 115 degrees magnetic, at 270, 12 miles, at time 47. Over.
12 07 09 11 OKI Okinawa, Roger. Out.
12 07 09 16 CMP Pick out the place.
12 07 09 19 CDR Okay?
12 07 09 20 CMP Okay --
12 07 09 21 P This is Photo. I have one -- there's something -- something's falling beside the command module. I could not tell what it was, though.
12 07 09 31 LMF Strut locks, four, unlocked.
12 07 09 33 R Apollo 15, Apollo 15, this is Recovery. Over.
12 07 09 38 CDR Recovery, Apollo 15. Everybody's in good shape, and we're looking at about 3500 feet.
12 07 09 43 R This is Recovery. I have a visual of 165 --
12 07 09 47 LMF Ten seconds to release.
12 07 09 48 R -- from me, about 8 miles.
Go ahead, Jim.

Stand by for purge dump.

This is Photo. It appears that one of your main chutes is streaming. I can only see two main chutes, and one appears to be streaming.

Yes... two chutes concurred.

They have one streaming chute.

Do we have three, Al?

We got two.

No, we're at 3000.

Stand by for...

Okinawa, this is Photo.

--...

Okay.

the extra fuel has been jettisoned and burned off.

Cinch up, gang.

Cinch up, gang.

Apollo 15, Apollo 15, this is Recovery. Over.

Got your VHF beacon on?

3000.

Yes, it's.

-- Jim.

3000, Jim.

Okay, CM RCS PROPELLANT, two, OFF.

OFF. 
12 07 10 30 CDR   Okay.
12 07 10 31 CMP   Two, off.
12 07 10 32 LMP   CABIN PRESSURE RELIEF VALVE to DUMP.
12 07 10 34 CMP   All right, coming to DUMP.
12 07 10 36 LMP   FLOODs to POSTLANDING.
12 07 10 43 CMP   Coming up on 2000.
12 07 10 45 CDR   How many chutes we got, Al?
12 07 10 46 CMP   We got two.
12 07 10 47 LMP   Two.
12 07 10 48 CMP   We got a streamer on one.
12 07 10 49 LMP   FLOODs to POSTLANDING.
12 07 10 51 CMP   FLOODs to POSTLANDING.
12 07 10 52 LMP   Stand by for 800.
12 07 10 54 P    This is Photo. Lost contact due to cloud cover.
12 07 10 57 R    Apollo 15, Apollo 15, this is Recovery. Over.
12 07 11 02 CDR   Roger, Recovery; 15. You're 5 square. Everybody's in good shape.
12 07 11 04 CMP   Okay, we're out at 1500, Jim.
12 07 11 05 LMP   Okay.
12 07 11 06 R    Roger, Apollo 15. If you hear, all units have you in sight, and we are eastbound now.
12 07 11 11 CDR   Roger.
12 07 11 13 CMP   1000 feet, Jim.
12 07 11 14 LMP   Okay --
12 07 11 15 CDR   ... dump.
12 07 11 16 LMP --- CABIN PRESSURE RELIEF to CLOSE.
12 07 11 17 OKI Apollo 15 ---
12 07 11 18 CMP CLOSED.
12 07 11 19 OKI --- this is Okinawa. Request your splashdown read-out. Over.
12 07 11 21 LMP Okay, you ready for MAIN BUS TIES to come OFF.
12 07 11 26 CMP Ready for BUS TIES.
12 07 11 28 P This is Photo. Approaching ...
12 07 11 30 CMP Okay.

END OF TRANSCRIPT