APOLLO 12
LUNAR MODULE (LM)
ONBOARD VOICE TRANSCRIPTION (U)
RECORDED ON THE LUNAR MODULE ONBOARD RECORDER DATA STORAGE EQUIPMENT ASSEMBLY (DSEA)
DECEMBER 1969

GROUP 4
DOWNGRADED AT 3 YEAR INTERVAL
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INDEXING DATA
DATE 12-00-69
OPR MSC

# T PCM SUBJECT (City)
SIGNATOR MSC LOC 079-14
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INTRODUCTION

This document is the transcript of the Apollo 12 flightcrew communications recorded on the lunar module (LM) data storage equipment assembly (DSEA). After the multiplexed voice communications and mission elapsed time had been recorded onboard the LM on a single track of the tape, the tape cassettes were transferred to the command module for the return to earth. The cassettes were forwarded to NASA Manned Spacecraft Center, Houston, where mission elapsed time was converted to ground elapsed time for this document. Transcription of these tapes was managed by David M. Goldenbaum, Test Division, Apollo Spacecraft Program Office, to whom inquiries concerning this document should be referred.

In the text, a series of three dots (...) designates those portions of the communications that could not be transcribed because of garbling. One dash (-) indicates a speaker's pause or a self-interruption. Two dashes (- -) indicate an interruption by another speaker or a point at which a recording was abruptly terminated. A series of three asterisks (***') indicates voice clipping caused by use of the VOX mode.

The Apollo 12 lunar-landing mission was flown November 14 to 24, 1969. The command and service module (CSM) was designated Yankee Clipper and the lunar module was called Intrepid.

Speakers in the transcript are identified as follows:

CDR Commander Charles Conrad, Jr.
CMP Command module pilot Richard F. Gordon, Jr.
LMP Lunar module pilot Alan L. Bean
SC Unidentifiable crewmember
MS Multiple speakers
CC Capsule communicator (CAP COMM)

The transcript is divided into three columns — time, speaker, and text. The time column consists of four two-digit pairs for days, hours, minutes, and seconds (e.g., 04 22 34 14). The speaker column indicates the source of a transmission; the text column contains the verbatim transcript of the communications.
DAY 5

04 11 52 07 CMP  Okay. Our RECORDER's ON. You should be on ICS/PUSH-TO-TALK, which you are.

04 11 52 15 CDR  Okay, Dick, I'm with you. And I'm going to P47 at 1 minute and 30 seconds.

04 11 52 27 CMP  Okay.

04 11 52 30 CMP  MARK.

04 11 52 31 CMP  There you go, 1:30.

04 11 52 33 CDR  Okay. And now, I'm going to dial up a VERB 77 and stand by on the ENTER as you release me.

04 11 52 39 CDR  Say, Al, RECORDER, ON?

04 11 52 41 LMP  It's ON.

04 11 52 54 LMP  Looking good. Looking good, Pete.

04 11 52 58 CMP  One minute.

04 11 53 03 CDR  Okay, Dick.

04 11 53 13 CMP  Footpads look kind of good. It's nice to see you with your landing gear down for a change.

04 11 53 22 CDR  Roger.

04 11 53 28 LMP  Okay. This will jump up to one so you won't have to take it out, Pete.

04 11 53 41 CDR  Huh?

04 11 53 43 LMP  That'll jump to one in a minute.

04 11 53 44 CMP  Five seconds.

04 11 53 45 LMP  Okay. Five seconds.

04 11 53 47 CDR  Five seconds?

04 11 53 49 CMP  Make that 15.
That's better.

Now, it's 5.

Okay, here you go again.

All right.

Watch him; watch him.

Back off, Dick.

Don't let him bump into any of our equipment.

There he goes.

I just wanted to wait and let that damp, Pete.

Okay. I - I got minus --

DEADBAND going MIN.

Yes. I got minus 1 and nothing, so forget it.

Okay. What, minus 1 and all zips. I'll write it down.

Yes.

Intrepid, Houston. Looks good.

How's the tube, Jerry?

Real good, Dick. Real good.

Okay.

Okay, Dick. Yawing left, 60.

Hey, Pete, you're cutting in and out to me.

Roger. Go off VOX.

Null NOUN 83's, you did - Are you in POO? You're yawing left, 60.

Yes.
04 11 55 27 LMP  Pitching up at 90. Going to set the DET time down to SEP, but --
04 11 55 31 CMP  Pete, give me a radio check.
04 11 55 33 CDR  How do you read, Yankee Clipper? 1, 2, 3, 4, 5; 5, 4, 3, 2, 1. How's that?
04 11 55 44 CMP  Pick up your yaw. How's that picture, Jerry?
04 11 55 52 CC   Clipper, Houston. The picture's beautiful.
04 11 55 57 CDR  24.
04 11 55 59 CMP  Quite a sight, isn't it?
04 11 56 03 CC   It sure is, Dick. We're copying Pete's yaw maneuver now.
04 11 56 07 CMP  ...
04 11 56 08 CDR  24 to 420.
04 11 56 09 CMP  Just about got it completed.
04 11 56 13 CDR  Okay, Dick, how do you read me?
04 11 56 15 CMP  Loud and clear, now, Pete.
04 11 56 16 CDR  Okay. Pitching up 90.
04 11 56 22 CC   Clipper, Houston here. Your FM is breaking up on occasion.
04 11 56 25 CMP  What - what's breaking up?
04 11 56 30 CC   You're FM is breaking up. It's looking good now.
04 11 56 43 CDR  What's next, Al, after I get done doing this?
04 11 56 45 LMP  Okay. Pitch up 90 and you should read 180, 195, 0. I've got to reset the DET countdown to SEP. That's where it is.
04 11 56 54 CDR  Okay.
04 11 56 55 LMP  VHF antenna's going to go to forward in a minute.
Intrepid, Houston. If you'll give us POO and DATA, we'll start your uplink.

Yes. You got it. How's the high gain? Still locked up okay?

Looks good; looks good.

Roger.

Where is he?

I don't know where he is. He's flying on - on us.

Okay.

He should be at - Let's see - Let me get it again.

You're going to get that Sun right in the window.

180, 195, 0. You're almost there. We give him F - We're going to give him forward VHF. We gave it to him now.

Get his picture.

Well, I can't. He's not in my window.

The hell he isn't. Look up.

Now, he is.

Okay.

Now, if you - You got to keep him really like that for this SEP maneuver. How far would you say he is out?

I haven't any idea.

I'd say 50 feet. I'm going to set it at infinity. Right in the Sun. I can't - It's going to be a sorry picture, but let's shoot it, anyway.

Forget it. Look at his antenna wobbling around. Isn't that something? Hey, you look pretty nice over there, Yankee.
<table>
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<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Text</th>
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<tbody>
<tr>
<td>04 11 58 32</td>
<td>CDR</td>
<td>Hey, Dick, you read me?</td>
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<tr>
<td>04 11 58 35</td>
<td>LMP</td>
<td>He's running his camera.</td>
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<td>04 11 58 36</td>
<td>CDR</td>
<td>I know. He's got it. It's keying his VOX.</td>
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<tr>
<td>04 11 58 40</td>
<td>CC</td>
<td>Yankee Clipper, Houston. How do you read?</td>
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<tr>
<td>04 11 58 42</td>
<td>CMP</td>
<td>Houston, Clipper. Loud and clear.</td>
</tr>
<tr>
<td>04 11 58 44</td>
<td>CDR</td>
<td>Hey, Houston, tell him to turn off his VOX because he's cutting out his own VHF.</td>
</tr>
<tr>
<td>04 11 58 54</td>
<td>CMP</td>
<td>Intrepid, Yankee Clipper. Say again.</td>
</tr>
<tr>
<td>04 11 58 57</td>
<td>CDR</td>
<td>Okay. You were cutting out your own VHF, being on VOX. Your camera was keying it.</td>
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<tr>
<td>04 11 59 04</td>
<td>LMP</td>
<td>Look at that antenna move.</td>
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<td>04 11 59 06</td>
<td>CDR</td>
<td>Yes.</td>
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<tr>
<td>04 11 59 07</td>
<td>LMP</td>
<td>Well, with that, let me get going here.</td>
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<tr>
<td>04 11 59 09</td>
<td>CDR</td>
<td>Do what?</td>
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<td>04 11 59 10</td>
<td>CMP</td>
<td>Okay. I'm off of VOX now, and you're cutting out on me now.</td>
</tr>
<tr>
<td>04 11 59 14</td>
<td>CDR</td>
<td>Okay, how's that?</td>
</tr>
<tr>
<td>04 11 59 15</td>
<td>CMP</td>
<td>Okay. That's better. Stay there.</td>
</tr>
<tr>
<td>04 11 59 19</td>
<td>LMP</td>
<td>LANDING RADAR, closed. RATE/ERROR MONITOR, LANDING RADAR/COMPUTER.</td>
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<tr>
<td>04 11 59 30</td>
<td>CDR</td>
<td>Okay, you got it on me. I'm not going to touch anything again.</td>
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<tr>
<td>04 11 59 34</td>
<td>LMP</td>
<td>Okay. Yankee Clipper. I'll turn on my tracking lights for a minute. See if you see it.</td>
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<tr>
<td>04 11 59 44</td>
<td>CC</td>
<td>Intrepid, Houston with a DOI PAD.</td>
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<tr>
<td>04 11 59 46</td>
<td>CMP</td>
<td>I've got it, Al. I've got your light.</td>
</tr>
<tr>
<td>04 11 59 50</td>
<td>LMP</td>
<td>Just a second, Houston.</td>
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</table>
04 11 59 54  CC  Okay. Standing by.
04 12 00 11  LMP  Go, Houston.
04 12 00 18  CC  Clipper, Houston. Try pitch, minus 78; yaw, plus 225 on your high gain.
04 12 00 27  CMP  Yes. That's where it's been, Jerry.
04 12 00 31  CC  Roger. You're breaking up pretty badly. Intrepid, Houston. P30 LM maneuver DOI PAD: NOUN 33, 109:23:39.41; NOUN 81, minus 0070.8; all zeros, plus 0015.1; NOUN 42, 0060.5, plus 0008.3, 0072.4; burn time, 0.29, 000, 297; AGS, minus 0070.9; plus all zips; plus 0014.4. The rest is NA. Over.
04 12 00 57  LMP  Roger. Copied 109:23:39.41; minus 007.8; all zips, plus 0015.1; 0060.5, plus 0008.3, 0072.4; 0.29, 000, 297; minus 0070.9; plus all zips; plus 0014.4.
04 12 02 30  CDR  Break, Houston --
04 12 02 31  CC  That's affirmative, Al. Break. The computer is yours.
04 12 02 34  LMP  Okay. That's what I wanted to know. Thank you.
04 12 02 41  CDR  Can't get any good pictures of you today, Dickie. The Sun's not in the right place.
04 12 02 48  CMP  That's okay. We'll do it tomorrow.
04 12 02 53  CC  Clipper, Houston.
04 12 02 55  CMP  Go ahead, Houston.
04 12 02 59  CC  Roger. Have you tried reacquisition on the high gain? And, if you have, why don't you try secondary transponder? Intrepid, Houston with a no-PDI plus 12 PAD.
04 12 03 17  CDR  Break, break. Houston, this is Intrepid. If it would be any help to you, Yankee Clipper's S-band antenna is just wandering - it's just oscillating back and forth in two directions, like it can't hold lock.
04 12 03 34  CC  Roger, Pete.  Thanks.
04 12 03 35  LMP  It looks like it's in some sort of continual search mode.
04 12 03 41  LMP  Ready to copy the no-PDI plus 12.
04 12 03 50  CC  Roger, Al.  NOUN 33, 110:32:04.70; NOUN 81, plus 0116.9, all zips, plus 0131.0; NOUN 42, 0147.6, plus 013.3, 0175.6; burn time, 041, 000, 199; AGS, plus 0114.8, all zips, plus 0132.8; NOUN 11, 111, 17, all zips; NOUN 37, 112, 58, all zips.  Over.
04 12 05 26  LMP  Roger, Houston.  Copy.  110:32:04.70; plus 0116.9, all zips, plus 0131.0; 0147.6, plus 0013.3, 0175.6; 041, 000, 199; plus 0114.8, all zips, plus 0132.8; 111, 17, all zips; 112, 58, all zips.
04 12 06 02  CC  That's affirmative, Al.  I've got your PDI PAD and your PDI is less than 10 and greater than 10.
04 12 06 13  LMP  Let her go, then.
04 12 06 22  CC  Roger, Al.  PDI T, 110:20:37.58; NOUN 61, 09.42, minus 0004.9; FDAI, 356, 110, 000; DEDA 231 is plus 56960; PDI less than 10; NOUN 37, 112:58 all zips; PDI greater than 10; NOUN 37, 114:57 all zips.  Over.
04 12 07 33  LMP  Roger.  Copied 110:20:37.58; 09.42, minus 0004.9; 356, 110, 000; plus 56960; 112:58 all zips; 114:57 all zips.
04 12 07 56  CC  That's affirmative, Al.  I have T2 for you now.
04 12 08 21  LMP  Go.
04 12 08 25  CC  Roger.  T2 abort: T, 110:42:02.00; NOUN 37, 116:56 all zips; T2 at PDI plus 21 minutes 25 seconds.  Over.
04 12 08 56  LMP  Roger.  110:42:02.00; 116:56 all zips; 21:25.
04 12 09 07  CC  Roger.  T3, if you're ready.
04 12 09 13 LMP  We are ready.
04 12 09 18 CC  Roger. T₃: T_{ig}, 112:27:42.00; P22 acquisition at 112:25:00. Break. Yankee Clipper, you are coming on loud and clear on the TV now.
04 12 09 41 CMP  Roger. I had to go to MANUAL on my high gain. It won't stay locked on.
04 12 09 47 CDR  It's nice and steady over there, now, Dick. I guess something went wrong with the AUTO TRACK.
04 12 09 53 CMP  Yes. It's - I'm in MANUAL that I'm staying in then, now.
04 12 09 55 CDR  Yes. It's pretty solid. It just wobbles a little bit when you fire a thruster.
04 12 10 01 LMP  Readback, Houston, is 112:27:42.00; 112:25:00.
04 12 10 11 CC  That's affirmative, Al. Clipper, Houston. Did you try the secondary transponder before you went to MANUAL?
04 12 10 23 CMP  That's affirmative.
04 12 10 29 CC  Roger.
04 12 10 31 CDR  It must be something in the AUTO lock mechanism.
04 12 10 32 CC  Intrepid, Houston. I have your gyro torque angles.
04 12 10 38 CDR  Gyro torque angles? You got a place to copy them?
04 12 10 42 LMP  Just a second; just a second.
04 12 10 43 CDR  Yes. Hold it just a minute; we'll be right with you.
04 12 10 49 CC  Okay. Standing by.
04 12 11 03 LMP  Let me have that, Pete.
04 12 11 09 CDR  Do you have any fog on the outside of your - No, you don't.
When did - when did they ever give me any of those things?

You know what they're for; they go right here. Right here. I'll copy them here and you copy them there. Tell them to go ahead.

Go ahead, Houston. Ready to copy.

Roger. Your LM gyro torque angles: X, minus 0004.5; Y, minus 0003.5; Z is minus 0009.2. Over.

Roger. Copied minus 0004.5, minus 0003.5, and minus 0009.2.


That's a busy mother.

Okay. Go, and I copied all the other.

Roger, Dick. LOS 108:56:58 --

My ears just cleared. Man, that hurt.


... that camera over there.

Affirm.

What, Pete?

And I'm standing by for SEP.

Did you set RD up, Pete?

Yes, sir. You verified the tracking lights?

Yes.

I've gone to VERB 76. You got all this? We're standing by for CSM SEP, right?

How long before it?
04 12 13 09  CDR  Eleven minutes.
04 12 13 10  LMP  Eleven minutes. Okay. We got -- we got a new tracking --
04 12 13 14  CDR  Huh?
04 12 13 15  LMP  We got a new altitude for tracking. The trouble is tracking; they raised the altitude -- I think that's in hundreds of feet. They raised it 24 feet. I think it's 20 -- 240.
04 12 13 42  CDR  Yes, let me look.. Say, Houston, this SIM's running pretty smooth today.
04 12 13 46  LMP  You'd never let me say that, babe. It looks like, because of your tracking, Dick, they raised the landing site altitude about 2400 feet.
04 12 14 05  CMP  That's not to believe, Al. Looked like it was in a hole to me.
04 12 14 11  CDR  And, Houston, I guess you saw the landing radar self-test. That came out 4.0.
04 12 14 21  CC  Roger, Pete. We copied that.
04 12 14 23  LMP  ... ... again.
04 12 14 26  CDR  Right in the --
04 12 14 29  CC  Intrepid, Houston. We'd like to get your valve on transmitter power on that.
04 12 14 37  CDR  Okay. Wait 1. They were both 3.6. Actually, isolated velocity XMITTER was 3.62, and the altitude XMITTER was 3.60.
04 12 14 58  CC  Roger.
04 12 15 00  CDR  I got to get that camera out here. Got to get the camera out. I've got it in my hot hand. Okay. What's the SEP time?
04 12 15 08  LMP  SEP time is 108:24:22. Does that strike a memory blank anywhere?
No. Is that the time they actually passed?

That's the one you - that's the number you gave me.

Okay.

Is that the one they passed?

Houston, Yankee Clipper.

Yes.

Go ahead, Clipper.

I'll go back to PRIMARY TRANSPOUNDER, here, as soon as we separate. ... hasn't helped a bit. Looks like I lost the AUTO track feature in the high gain.

That's going to be a pain.

Roger, Dick. We concur on that.

All right, Dick. You're - we're still in secondary SERVO's there. You might go back to primary ones.

All right, Conrad. You're stealing our ..., now.


If you'll recall, that's why we left it in the first place.

You keep your mike just ahead of me.

If you both recall, that's why we left it in the first place.

Yes. But it wasn't breaking lock then. You were - it's just getting intermittent signal strength.

What's it getting now?

That's right.

Only reason I'm beating you, Jerry, is I'm 257 000-some-odd miles closer to him than you are (laughter).
A good answer. Now, look, try to keep him -
You're going to track him anyway. Try to keep
him in my window and I'll take some shots of him.

Just tell me where you want to go.

Okay, babe.

Because I'm going to pitch to 247 as soon as
he goes.

Okay. Well, that's the same way. But I'm going
to track him for 4 minutes, and it you'll just
keep him over here and not let him get over in
your window.

Okay.

Now, he's in a pretty good position.

It's on. It's running. It's running.

This isn't running.

The green light's on.

That doesn't mean it's running. It's a timer.
It's timing this little package. It'll go out in
a second. It times this little package to tell
it what film it is and now - -

Ho, ho, ho.

-- each of them has it - that little microswitch;
if I release it and do it again, it'll do the same
thing.

Oh.

Now, I'll check it, though, because it might not
work.

Now, look, I'm going to yaw back to the left.

Okay.

Man, does that look hard and barren down there.
You're doing right, Pete. Man, it's going to be little.

Yes.

Far away from it.

Yes.

I'll tell you one thing, I've been - a bad habit I've gotten into, and I'm having to be careful here, is I'm always grabbing this hand controller to - to talk. And I - I don't grab it; I just go like this, and I - oh God, and then I have to use this.

We got about 12 degrees to go.

You can sure see those thrusters fire, can't you?

Yes.

Intrepid, Houston.

Go.

Roger, Pete. The way things are looking right now, you're going to be starting PDI about - about 5 miles north of track; and, during the descent, you are going to be steering south.

Five miles north of track. Okay. As long as it knows it, it's okay with me (laughter). My ears cleared up. I don't know why. It pisses me off. Everything's as clear as a bell.

Clipper, Houston. Are you going to try those primary servo electronics?

It's been tried. How's it looking?

Looking good and solid now.
04 12 20 00  CDR  
That's right. The antenna's not moving around at all. It appears to be locked on tight.

04 12 20 11  CC  
Clipper, Houston. Are you in AUTO now?

04 12 20 17  CMP  
That's negative.

04 12 20 27  CDR  
Forget it, Dick, go back to MANUAL.

04 12 20 32  CC  
Roger. We copy you're AUTO, Dick. You're better off in MANUAL.

04 12 20 36  CDR  
You still in AUTO, Dick? It's just locked up solid, if it is.

04 12 20 39  CMP  
No, it's MANUAL.

04 12 20 40  CDR  
Oh, okay. Sorry.

04 12 20 46  CMP  
I can move around in here pretty good when I've got all this room.

04 12 20 55  LMP  
Hey, the next time you're going to pitch or do something, let me know and I want to watch the thruster.

04 12 21 00  CDR  
Okay.

04 12 21 02  LMP  
Tell me what you are going to do first, though.

04 12 21 05  CDR  
I'm going to start to pitch down after a while.

04 12 21 07  LMP  
Okay, when you do, I'll watch.

04 12 21 09  CDR  
Why don't I just do a whole bunch of them, as soon as he goes?

04 12 21 12  LMP  
How's he getting above us like that?

04 12 21 15  CDR  
I don't know. He's going to fire straight down.

04 12 21 18  LMP  
I know it. I'm going to have to wait and catch him when he is low.

04 12 21 20  CDR  
Yes.
Try to keep him - Do what you can. I know you've got lots to do.

Let's look over these systems.

Yes. It's looking good, Pete.

Wonder what we're going to do without our high gain? We'll have to go on OMNI's most of the way.

Yes. They can do it. No sweat.

This is one of the better visuals I've seen, Dick.

Yes. You're right. I've been taking stills, and I let it get out of view of TV. I got to get you back.

I got you 1 minute and 40 seconds --

MARK.

-- to SEP.

Clipper, Houston. You're GO for SEP.

Roger.

Do you get the idea this thing rocks every once in a while?

I haven't noticed it, but I haven't - if I don't --

I know what it is. It's that antenna over there is driving me buggy, everytime that thing moves.

Intrepid, Houston. Give us a mark with 1 minute to go to SEP, would you?

It's already 1 minute. I'll give you one at 45 seconds.

MARK.

Forty-five seconds.
Wonder why he wanted one. Suppose we got the wrong time?

I don't know.

That's the one you wrote down that he gave us, huh?

Yes.

Okay. That's got to be it.

You concur with that, Yankee Clipper?

I don't have average g yet, Pete.

Okay. I - I may have copied the time down wrong or something.

108:24:42.

Okay; 42. I got 22. I had the nominal time.

Average g.

Very good.

I'll be watching you.

Okay. We'll be looking for you, too. Okay. There he goes. He's burning.

Funny, I didn't - Now, he's burning.

Yes. There he goes; there he goes. Look at that.

Intrepid, Houston. You were off on that figure by 20 seconds. CSM was right.

Yes. I had the wrong time. He's burning now, and he looks good out there.

Burn's complete.

By-by.
04 12 25 01 CMP  See you, troops.
04 12 25 13 LMP  Let him get low, Pete. I can't take his picture. He's way too high.
04 12 25 17 CDR  Okay. Why is he way too high? I can see him in my window fine.
04 12 25 23 LMP  He's way up at the top. I just - It won't be - Let him get a little lower. Besides, it isn't much of a movie, anyhow.
04 12 25 34 CC  Clipper, Houston. You can terminate average g, now.
04 12 25 38 CMP  It's done. It's done.
04 12 25 39 LMP  Okay. We got a good updata link?
04 12 25 43 CDR  Okay, Houston, we're in updata link for you any time you want to send us his state vector.
04 12 25 49 LMP  No. Forget it.
04 12 25 54 CC  We'll be ready in about 3 minutes, Pete.
04 12 25 56 CDR  Okay, in the meanwhile, I'm going to take the computer. Give me a holler when you are ready.
04 12 26 00 LMP  Okay, now - I am going to start shooting him, now.
04 12 26 04 CDR  Okay.
04 12 26 05 LMP  This might not turn out because we're looking right at the Sun.
04 12 26 07 CDR  Yes.
04 12 26 08 LMP  Get up here. Maybe I can make it. That's a perfect place, Pete. Don't get it - don't let him get any higher in the window than that. Let him get lower in the window.
04 12 26 25 CDR  I'm tracking him exactly. I don't want to waste gas.
04 12 26 28 LMP So, okay. Okay. That's going to be a beautiful shot. Because he's coming down below us. Look at that.

04 12 26 45 CDR Boy, do you look neat down there against the Moon, Dick.

04 12 26 52 CMP Got your pictures?

04 12 26 54 CDR We're taking them. We're taking them.

04 12 27 05 LMP Okay. I need to set ORDEAL.

04 12 27 14 LMP God, that's going to be fantastic shot.

04 12 27 33 LMP Going to be a beautiful picture, Pete. God, it's going to be beautiful.

04 12 27 47 CDR Dick, you want to get your transponder on?

04 12 27 55 CMP Okay.

04 12 28 08 CC Clipper, Houston. Try OMNI Bravo.

04 12 29 14 LMP They want OMNI Bravo.

04 12 29 30 CMP Hello, Houston.

04 12 29 31 LMP Boy, Conrad, if that turns out, it's going to be so spectacular. Don't let me get behind a power curve here.

04 12 29 40 CDR Al, I think you've had enough.

04 12 29 43 CMP You still have the TV on the OMNI?

04 12 29 51 CC That's negative, Clipper.

04 12 28 52 CMP Okay. I'll secure it.

04 12 29 05 LMP Supposed to shoot 1 more minute.

04 12 29 07 CC Clipper, Houston. Would you check your DELTA-V<sub>CG</sub> switch to CSM?

04 12 29 13 CMP CSM. Thank you.
04 12 29 16 CDR  We're going to go over our landing site here somewhere.

04 12 29 30 CMP  Intrepid, Clipper going to DUPLEX B and RANGING.

04 12 29 33 CDR  Okay. We're not ready for you yet, but you go ahead there, and we'll come up --

04 12 29 39 LMP  Right now. We'll do it.

04 12 29 40 CDR  Okay. We're coming up now.

04 12 29 41 CMP  Okay.

04 12 29 52 LMP  How do you hear us now, Dick? Should be on hot mike.

04 12 29 55 CMP  Okay. Loud and clear, but let me get - get locked on. Don't talk to me for a minute.

04 12 30 02 LMP  ...

04 12 30 12 CDR  Bring up the cabin lights.

04 12 30 14 LMP  Cabin lights coming up.

04 12 30 16 CDR  Floods and all that good stuff.

04 12 30 19 LMP  Okay. Let me get this camera and stow it away.

04 12 30 25 LMP  Okay.

04 12 30 27 CDR  We're in ATT HOLD; VERB 77. Are you ready with that update link, Houston?

04 12 30 35 CC  That's affirmative, Pete. Go to POC and DATA.

04 12 30 38 CDR  You've got it. POC and DATA.

04 12 30 42 CC  Roger. Intrepid, Houston. We got another delay. It'll be another minute before we can start it up.

04 12 30 56 CDR  Okay. I'll just skip down here.

04 12 31 01 LMP  Okay. Do you want me to mark - want me to cross them off?
04 12 31 07  CDR  Huh?
04 12 31 09  LMP  You want to check those off?
04 12 31 17  CDR  Where's the radar antenna?
04 12 31 21  LMP  Let me look.
04 12 31 22  CC  Intrepid, Houston. It's on its way.
04 12 31 29  CDR  Got to be in mode 2 or something. I got it.
      What was that?
04 12 31 41  CC  Intrepid, Houston. You ready for your data?
04 12 31 44  CDR  Yes. Go ahead.
04 12 31 47  CC  Okay. It's on the way.
04 12 31 50  CDR  Okay.
04 12 31 52  CMP  I got you 0.2 of a mile.
04 12 32 19  CDR  What the hell - oh. Pitch.
04 12 32 28  CMP  Pete, I show you locked on with the radar.
04 12 32 31  LMP  I'm going to flip the AGS to AUTO.
04 12 32 33  CDR  Okay. I've got AUTO track.
04 12 32 54  CDR  For some reason, we show a great deal out of
      plane.
04 12 33 25  CC  Intrepid, Houston. The computer is yours. Break.
      Clipper, Houston. If you'll go POO and ACCEPT, we've got your uplink.
04 12 33 33  CMP  Okay. It's all yours.
04 12 33 42  CC  Roger, Clipper. It's on the way.
04 12 33 48  CDR  Check your AGS needle.
04 12 33 50  LMP  I did and they weren't even close.
04 12 33 51 CDR  Check them again. You haven't been updated, yet; that's why.
04 12 33 58 LMP  That's right. You still haven't been updated.
04 12 34 07 CDR  Okay. I hold you at 1.3 - No, excuse me, Dick. I'm looking at the wrong register; 0.22 at about 3 feet per second.
04 12 34 20 CMP  I've got it. I've got you at 0.2526 on the VF - VHF.
04 12 34 30 CDR  And the tapemeter looks good?
04 12 34 35 LMP  I need an update.
04 12 34 36 CDR  All right. I got - I got ahead, here.
04 12 34 39 LMP  Okay.
04 12 34 40 CDR  I had to. Now, let me just get through this right.
04 12 34 42 LMP  Okay.
04 12 34 47 CDR  I also show you going a good ways out of plane to me for some reason.
04 12 34 51 CMP  I've got the same thing myself. I don't understand it. Coming - think I'm coming back a little, though.
04 12 35 04 CDR  Okay. I've got him at 1500 feet. That's perfect. Now --
04 12 35 07 LMP  23 - 23 minutes, 36 minutes, and 23.
04 12 35 21 CDR  Everything agrees.
04 12 35 24 LMP  At the --
04 12 35 25 CDR  Okay.
04 12 35 27 LMP  47. 47 would be 13, 13.
04 12 35 37 CDR  Now, you can check your AGS needles in a minute.
04 12 35 38 LMP  Okay.
Because I'll just point at him then.
Okay. Just a second.
36; That'll mean that there's 24 minutes and another 23 would be 47 minutes, few minutes, 39.
Let me know when you can give me a 47.
All right. I can do it right now.
Go ahead. Throw.
Okay. Now, let me go ahead and track Dick.
36, 36, that would be --
That's it. Right there.
37, 3 --
Now, can you check your AGS needles real quick?
I can if you can give me an update.
It's coming across.
Okay.
We're ready to start this alighment right on time.
I haven't gotten it yet. Oh, it's got that long computer time.
Yes.
Why don't we start getting the lights down in here?
Well, the Sun's shining right in the window, right at the moment.
Okay.
There it is. You should have it.
I've got her.

Okay. Now, check your AGS needles real quick. Because I'm pointing just about out --

Okay. There - here they come.

Okay.

They're that far off. Pretty far.

Oh, that's pretty sorry.

Yes. But we're in close and you know the AGS is not --

Okay.

-- any good there.

Okay. Go ahead. Now, bring up the lights. Wow!

How about some exterior lights for me?

Okay. Coming on.

Are we supposed to?

Give him the tracking light.

Pete, are we supposed to?

Do you have my lights?

Sure do.

Okay. Your tracking light's on.

All right. Let me PRO out of there. Let's get the damn lights up where we can see.

Yes.

Now. We need a 400 plus 3.
All right. You get A.

Give me a VERB 40 NOUN 20, please. Now, I want to - I got to look at this P30, and then we're done. I did this, this, this, this, this, this, this.

How long we going to keep this VHF RANGING on?

And that. All done. Okay. Can I look at P30?

My AGS and PGNS don't really line up too good. They're off in roll.

And let me have the DO - -

Clipper, Houston. Computer's yours.

Let me have the DOI PAD.

In a line, 2, 3 -

Want to set this clock counting up to DOI?

I think I did.

Yes. You're right. Hope it is. I'll tell you what you never did. You never gave me a VERB 83. If you ever can do it, it should be nice.

Do you want to reset that clock? Here's a VERB - -

No.

All right, VERB 83.

ENTER, and that clock's not right.

Come on. We got to get going. We're late.

No, no, we're not. Here's 20 right here, and we're only 17 here.

We're just right.

Come on, 83, you - -
Day 5

04 12 40 47 LMP It takes a long time.
04 12 40 49 CDR I know it.
04 12 40 50 LMP It's right on.
04 12 40 52 CMP I've got you at 4.7 miles.
04 12 40 56 CDR Okay. I've secured mine, Dick.
04 12 40 58 CMP Okay.
04 12 41 01 CDR There it is. My VERB 83 shows you 4.7 at 3-1/2 feet a second.
04 12 41 09 CMP Okay.
04 12 41 11 LMP Boy, mine's different than yours.
04 12 41 16 CDR Well, we better update it again.
04 12 41 18 LMP That's what I think.
04 12 41 20 CDR Are you in --
04 12 41 30 CDR Let's do it again.
04 12 41 32 LMP Go.
04 12 41 33 CDR Now, wait a minute. I want to get this clock running right here. This is not right.
04 12 41 37 LMP Okay.
04 12 41 41 CDR It's off by 1 second.
04 12 41 54 CDR If I just hold it for 1 second, it ought to be right, huh?
04 12 41 57 LMP Yes.
04 12 41 59 CDR Stop, start. All right.
04 12 42 09 LMP It's okay.
04 12 42 10 CDR All right. PRO? No, wait a minute; I've got to go to P40. Let me get it done.
Okay.

Okay. Hou - Houston, I'm going to P40 for you to look at it.

Roger, Pete. Stand by.

Holy Christ, are those the right angles?

Intrepid, Houston. We're copying your P40.

Okay. Can I go? Oh, add 180, that's right. Okay?

Roger. Go.

Add 180, ... to this.

Well, that thing's, that --

That's roll.

Okay.

So add 180 to --

Okay.

That. Okay. All right, now. VERB 47.

Okay.

God, this takes long. Hey, I'm going to yaw as soon as I get done doing that. Dick, I'm going to start my yaw maneuver in a minute and go ahead.

Okay.

Yaw right to 98.

How's the high gain going to do? Stay locked on, I guess?

Let me check it. Hey, your book's floating up.


Supposed to. Seems to be.
God damn, we ought to have this alignment done.
Heck, Pete, we're not even supposed to be there, yet.
I know. I just want to stay ahead.
Shit, you make me think we're behind all the time.
Got to hustle, boy.
Shucks, we've just got to do this.
Okay. You've got your update in.
Okay.
Let's don't bother checking it.
Let me ask Houston about the AGS and PGNS; see how they think. Houston, Intrepid, how do you think the AGS and PGNS compare? Let them figure that on one out.
Stand by 1 second.
Flood --
VHF ANTENNA to AFT. You're going to have to pull that floodbreaker.
That's what I'm going to do, right now.
Okay.
VHF ANTENNA is AFT.
Okay.
Just a minute now. You usually use your flashlight, remember?
Yes. All right. Now.
Intrepid, Houston. Your PGNS and AGS look real good.
Okay. Thank you.

Let's forget checking any of the rest of that stuff, then.

Okay.

Now, let me get my side panels off.

Okay.

I'm going to turn down the integral - turn down the DSKY a little bit.

Okay.

Bring on the flashlight. Okay, going to VERB 37, ENTER, 52, ENTER. That's - We want an option 3, VERB.

Yes, that's right. Option 3.

VERB 22, ENTER, 3, ENTER, PRO. Now, I want to ENTER and pick the first star. Right?

That's right. Go ahead.

VERB 21, ENTER, B 10, 2, --

213.

213, ENTER. Now. It's going to be an AUTO maneuver.

Yes.

And I want a VERB 76, ENTER, and I want a PRO. There's a set of gimbal angles.

Holy shit.

That's all right. Here we go. Hang on, you're going for a ride.
04 12 46 39 LMP  Okay.
04 12 46 42 CDR  Now, we may lose the antenna, right?
04 12 46 44 LMP  Well, I don't know. We're not supposed to.
04 12 46 47 CDR  Okay. It's right on in yaw.
04 12 46 53 LMP  Let me know when we're near there.
04 12 46 56 CDR  We've got a long way to go.
04 12 46 57 LMP  Man, this is a fast maneuver rate. What you got in this thing.
04 12 46 59 CDR  Two degrees a second (laughter).
04 12 47 00 LMP  You're kidding.
04 12 47 01 CDR  No, I'm not kidding (laughter).
04 12 47 02 LMP  That's not 2 degrees a second.
04 12 47 03 CDR  Look at the ball.
04 12 47 05 LMP  I'm looking.
04 12 47 06 CDR  Well, look at your rate needles. Man, there go the stars. Antenna looks good.
04 12 47 17 LMP  Okay. We there?
04 12 47 22 CDR  No.
04 12 47 25 LMP  I hope the Moon isn't in the way.
04 12 47 30 CDR  Well, let me get that heater off again. The Moon's not in the way. There's nothing but stars out there, buddy.
04 12 47 36 LMP  You are there. And the antenna's okay.
Okay. All right. Now, there's an ENTER; there's a PRO; there's a flashing 54. And I'm ready to mark for you.

Turn down these lights a little. There's Capella, bigger than life.

Okay. Tell me which way.

Okay. As slow as you can, pitch up and go left. Up, left.

Am I - am I in 54 now?

Yes, sir. That's a good Y-mark.

Okay. Flashing 52.

You can hit it one blip right.

Houston, Yankee Clipper.

Clipper, Houston. Go.

Are you copying my gyro torquing angles?

Flashing 52; it's almost there, Pete.

One blip off; it just isn't going to make it.

Clipper, Houston. We've got you now.

Good mark.

Okay.

Down and right.
Am I in 54?

Flashing 54. One more down. Okay, I think the roll is giving you a problem. How is your roll?

It's steady.

More to right. Give me a couple right.

There you go. One down. Okay. We're get - that's good. Just hold what you've got.

I am. Beautiful mark.

53.

Okay.

Okay. Which way?

Up and left. Hold it. Flashing 54, 53. You're going to get it in a second.

Okay. No sweat.

Beautiful.

Beautiful mark, there, I tell you. PRO.

Okay. 202. What do we want?

VERB 21, ENTER. We want a 12 - oops. CLEAR. 212, ENTER; a PRO. And are you ready for an AUTO maneuver?

Which star are we going to?

12. Rigel.

Rigel. Okay.
Now, watch the gimbal angles. Here we go. I'll watch the antenna.

That was good marks there. This better come out good, or somebody is going to be mad.

What about that patch? Where - oh, there it is.

Hang on. We're going way out of plane.

That's right. That's where we're supposed to go.

Okay. Antenna looks good to me. Okay. You're locked in. Flashing 5018. Look through the window first before I do anything.

I'll be right there, buddy.

She is there. Give me a 54 and -

All right. Now, wait a minute.

ENTER, PRO; you're flashing 54. Tell me where to go.

Down, right.

Down, right.

More right.

More right. In just a minute, I'm going to ask you to give me one last right.

Okay.

Okay, flashing 53.

One left, one - one left and that's it.

Flashing 53.

Okay, let me get a Y-mark.
04 12 51 37 CDR  Okay.
04 12 51 43 LMP  Beautiful. Okay.
04 12 51 44 CDR  Okay.
04 12 51 45 LMP  Left and up. There you go, buddy.
04 12 51 55 CDR  Flashing 53.
04 12 51 56 LMP  No. REJECT that.
04 12 51 59 CDR  Okay.
04 12 52 00 LMP  What have I got? A 5½, now?
04 12 52 01 CDR  Yes.
04 12 52 02 LMP  Okay, pitch down and right. Didn't like that one. That's a good mark there.
04 12 52 13 CDR  Flashing 53. What time is LOS, I wonder.
04 12 52 24 LMP  Okay, now, up and left. Up.
04 12 52 30 CDR  Houston, what time is LOS?
04 12 52 35 LMP  ... 52.
04 12 52 37 CC  Intrepid, Houston. LOS is coming up in 4 minutes.
04 12 52 45 LMP  Letter F. Flashing 52.
04 12 52 51 CDR  Okay. Okay, we'll try and have this alignment finished for you, so you can look at it.
04 12 53 00 LMP  That should do it.
04 12 53 01 CDR  Okay.
04 12 53 02 LMP  Be good, you son of a gun.
04 12 53 04 CDR  Turn up the light. Here's the star angle difference, Houston. Four balls 2 --
04 12 53 09 LMP  That's it.
Coming at you with the torquing angles. Whee! Look at that!

Now, try the torquing angles.

How's that grab you? You looking at the DSKY?

Those are great. You're GO for DOI.

Hey, ... ...

Yes. You guys are all right.

We are looking at an AOS of 109:43:30.

109:43:30. Nothing, that's the antenna, you're going to break lock.

I know it.

I'm going to torque.

I'm not breaking lock, damn it.

And, Clipper; Houston. We're looking for your AOS at 109:41.

Okay. I'll be there.

Now, wait a minute. I don't want to blow this. And I didn't copy that down, but that's okay.

You can probably call it up from memory.

Now, ENTER.

What the hell is ENTER? Ollll, huh? Okay?

Yes. That's right.

All right. PRO.

Okay.

VERB 24, ENTER. Now, plus, ENTER. 340, 50 in pitch! Oh, okay. Hang on.
04 12 55 15  LMP  Let me see that.
04 12 55 19  CDR  ENTER; detent, closed.
04 12 55 21  LMP  I did.
04 12 55 23  CDR  Yes. What star is it I'm looking for?
04 12 55 28  LMP  You're looking for Aldebaran in the - Taurus the Bull.
04 12 55 30  CDR  Yes. Okay. That one I know.
04 12 55 32  LMP  Plus 12 and 0. Plus 12 and 0.
04 12 55 39  CDR  Who said you couldn't look out the AOT and - and - and see this thing? Hell, I can see the stars in broad daylight with the cockpit lights up. There it is.
04 12 55 58  CC  Intrepid, Yankee Clipper. You're looking good. One minute to LOS; we'll see you on the other side.
04 12 56 03  CDR  Yes, sir, and after all that jazz about the LPD, old Aldebaran is a half a degree off in yaw and a half degree off in pitch, which is in the noise level; and I can see it out the window; no strain.
04 12 56 22  CC  Beautiful, Pete, beautiful.
04 12 56 29  CDR  Okay, it's 1 degree out. Forget it.
04 12 56 31  LMP  Want to mark it? You want to mark it with this thing, right here?
04 12 56 34  CDR  No, hell no. I know where it is.
04 12 56 36  LMP  All right, babe. Let's get some lights in this thing.
04 12 56 39  CDR  Turn them up.
04 12 56 42  LMP  We don't need to look.
04 12 56 43  CC  Intrepid, Houston. Is that in relation to your new mark or the old one?
04 12 56 46 CDR
No. That's right around the 40 mark. It's off about three-quarters of a degree to the right and about 0.2 of a degree down in pitch. Beautiful. It's not even worth screwing with.

04 12 56 57 LMP
Just - just lost him, Pete.

04 12 57 00 CDR
Yes, okay. Now, wait a minute. Where was I? Hey, Dick, go ahead and start checking my data, babe.

04 12 57 10 LMP
You better call him.

04 12 57 11 CDR
Okay, now. This detent closed?

04 12 57 14 LMP
It's closed. Those are checked off.

04 12 57 17 CDR
PGNS MODE CONTROL, ATT, HOLD. Yankee Clipper, Intrepid.

04 12 57 28 LMP
Hello, Yankee Clipper; Intrepid.

04 12 57 32 CDR
Where'd he go?

04 12 57 34 LMP
I don't know.

04 12 57 37 CMP
Hey, Al, go ahead.

04 12 57 38 LMP
Okay, go VHF A SIMPLEX and record LM data. Here it comes, babe.

04 12 57 42 CMP
I'm already there.

04 12 57 44 LMP
Okay.

04 12 58 12 CDR
Check DPS, APS, RCS, EPS, cycle CWEA; throttle MIN.

04 12 58 33 LMP
We got to don helmet and gloves in a minute.

04 12 58 35 CDR
Why?

04 12 58 36 LMP
Because it says so, hush.

04 12 58 38 CDR
(Laughter) Okay.

04 12 58 41 LMP
(Laughter) Get this star (laughter). I'll check the DPS's. Rendezvous radar, slew 00; open our
rendezvous radar breakers, the rendezvous radar breakers, check DPS, APS, RCS, EPS; cycle the CWEA.

04 12 58 56 CDR
THROTTLE CONTROL, MANUAL; COMMANDER TTCA, both throttles MIN. Okay?

04 12 59 06 LMP
Okay by me.

04 12 59 07 CDR
And don't hit yours sideways because they'll fire.

04 12 59 09 LMP
I'm not going to touch it.

04 12 59 10 CDR
Okay. And at 35, we're right there. Thirty-five or 40. We wait for 40, don helmets and gloves, and - and I ought to maneuver to the burn attitude. What the hell is that?

04 12 59 27 LMP
God damn, don't change.

04 12 59 28 CDR
Huh?

04 12 59 32 LMP
... ...

04 12 59 33 CDR
What do you mean?

04 12 59 34 LMP
Well, here I was just going to -

04 12 59 37 CDR
Shhh! Don't change the gain.

04 12 59 39 LMP
Have you got these two rendezvous radar circuit breakers open?

04 12 59 41 CDR
Yep.

04 12 59 44 LMP
What are we going to do? AUTO maneuver?

04 12 59 45 CDR
That's okay.

04 12 59 47 LMP
AUTO maneuver at 45. Sit right like this. Cycle CWEA.

04 12 59 51 CDR
Okay.

04 12 59 53 LMP
That simulator doesn't do like that. Did you notice? You never have that second MASTER ALARM. I didn't check the EPS, Pete.
Okay.

I feel good. I'm feeling better. You ought to get your hand in the game once.

Hey, that was a fantastic job on that alignment, Al.

We slid it in.

Can't beat the first team.

MANUAL; COMMANDER.

Both MIN.

Both MIN. We get our helmets and gloves on; we've got DESCENT QUANTITY to come on in 1 minute. Who's helmet's that? It must be mine, huh?

Yes. Here's mine. Does it make any difference? We're all going to the same place.

That's right. Come on, IMU do your job, boy. Five miles north of track, huh?

Go to them.

That's interesting.

Don't enter that NOUN 69 until I've seen that mother.

No, I won't. We got all the time in the world going down in descent.

That's right.

The big time is high gate. We got a long time to high gate. Just watch those systems perk along.

Hell, I'm kind of surprised they're happy with the PGNS and AGS. That surprised me a little bit.

Well, it may be doing a lot better than you think it is.
That's right. I'm hoping it is. Because I didn't like the alignment, and I didn't like the numbers I was getting out of it.

Hey, why don't you turn up a little of that LCG cooling? I'm not - I'm getting hot, now.

All right. Will do. Just give me a second.

I - I - How do you feel?

I could care less.

(Laughter) Okay, look. This is coming on because it's - it'll be in 40 and I'll bring it on.

Okay. Whoops. Okay, I've got to get in my restraint again.

I'm in mine, aren't I?

Yes. You better be, hadn't you? Okay, where's that camera supposed to be set up for PDI? That's going to make me mad; I think it's supposed to be 12 frames a second.

Hey, that's cold enough. God damn. (Whistle)

I just barely moved that son of a gun.

Whee!

Let me turn her down. That was too much. There you go. That thing is sensitive.

Boy, I'd say that again. Have we got anything that's going to fall on the floor?

No.

Okay, DESCENT QUANTITY 1; helmets and gloves are on; I'm waiting for a P40, and an AUTO maneuver.

Okay.

MODE CONTROL PGNS, AUTO; AUTO maneuver.
04 13 04 00  IMP  All the systems look good, Pete.
04 13 04 13  CDR  Got the GIMBAL AC closed?
04 13 04 16  LMP  Got the GIMBAL AC closed.
04 13 04 18  CDR  STABILIZATION and CONTROL circuit breakers, all closed except the AEA and the AELD and ABORT STAGE.
04 13 04 24  LMP  That's correct. I kind of agree with you over here, baby doll.
04 13 04 30  CDR  RATE's stay open; DOI is 5 degrees a second.
04 13 04 32  LMP  Five degrees a second.
04 13 04 33  CDR  THROTTLE CONTROL, MANUAL; COMMANDER.
04 13 04 34  LMP  MANUAL; COMMANDER.
04 13 04 36  CDR  ATTITUDE TRANSLATION, 4 JET.
04 13 04 39  LMP  4 JETS.
04 13 04 40  CDR  BALANCE COUPLE, ON.
04 13 04 41  LMP  ON.
04 13 04 42  CDR  ENGINE GIMBAL, enable.
04 13 04 43  LMP  Enable.
04 13 04 44  CDR  DESCENT ENGINE COMMAND OVERRIDE, OFF.
04 13 04 46  LMP  OFF.
04 13 04 47  CDR  COMMAND ABORT, ABORT STAGE, reset.
04 13 04 49  LMP  Okay.
04 13 04 50  CDR  DEADBAND, MIN.
04 13 04 51  LMP  MIN.
04 13 04 52  CDR  ATTITUDE CONTROL, three of them, ROT CONTROL.
04 13 04 53 LMP   ROT CONTROL.
04 13 04 56 CDR   It's going to be FGNS, AUTO; AGS, ATTITUDE HOLD.
04 13 04 59 LMP   All right --
04 13 05 00 CDR   That's exactly where it is.
04 13 05 01 LMP   -- That's right there, and all I need to do is call PHO.
04 13 05 02 CDR   STOP buttons, two of them, reset.
04 13 05 04 LMP   Mine's out.
04 13 05 05 CDR   So is mine. TTCA, two of them; THROTTLE, MIN.
04 13 05 09 LMP   THROTTLE's MIN.
04 13 05 11 CDR   That's where we stand as of right this second.
04 13 05 13 LMP   Okay. Let's look over this mother. See if we missed anything.
04 13 05 29 CDR   I'm going to get a - some kind of an alarm for the 203 that we enter on.
04 13 05 42 LMP   Burn abort rules. Why don't I read you a few?
04 13 05 44 CDR   Yes. Why don't you?
04 13 05 46 LMP   Manual shutdown if DELTA-V goes negative, and really that's - ...
04 13 05 51 CDR   Okay. It's starting to rise again.
04 13 05 55 LMP   Okay. Two-second overburn in AGS. I'll watch the AGS, and I'll watch the time.
04 13 06 00 CDR   Yes, what is the burn time?
The burn time is 29. Same old number.

Okay.

Manual takeover, all that baloney, 5 and 5. If PGNS is greater than 10 foot per second in any axis - got to do a DOI plus 10. Forget it. If the AGS and PGNS differ by - And then we got a few other hot rules here like, less than 2, go out for trim to 5. I gather then that if it - if the burn is anything less than 5, you don't trim.

That's right.

Okay. If it's between 2 and 5 at DOI plus 30 and RR confirms that PGNS NO-GO, do it no-PDI plus 12. Forget it. You're going to have to copy these residuals down. Both of us do.

Yes. That's why they're on there.

You've got to get them. I'm going to look at my 267. I've only looked at it four times so far. ... 450.

(Laughter)

Gene Cernan missed this one.

Yes.

We can't do it. I'm freaked up enough as it is.

Hey, Yankee Clipper; Intrepid.

Go ahead.

Is it all right with you if we turn our tracking light off?

Sure is.
04 13 07 11  CDR  Yes. We want to save it.
04 13 07 17  LMP  Okay. Okay, baby doll; 367.
04 13 07 24  CDR  Okay, now. What are you going to do? Is there a P40 in there right now?
04 13 07 29  LMP  I'm waiting until 45.
04 13 07 31  CDR  Okay.
04 13 07 37  LMP  Hold it - Just a little - just a bit.
04 13 07 43  CDR  I'm going to do it right now.
04 13 07 45  LMP  I'm with you, babe. Let's begin this show early. That's what I wanted to see.
04 13 07 54  CDR  Glycol looks okay. All this stuff looks okay.
04 13 07 56  LMP  Hang on.
04 13 08 00  CDR  Okay, Clipper, we're maneuvering to the DOI burn attitude at this time.
04 13 08 05  CMP  Okay. How many minutes you got to go?
04 13 08 08  CDR  About 16 - 15-1/2.
04 13 08 21  LMP  That's a great quantity gage we've got.
04 13 08 23  CDR  They all do that. They don't do anything --
04 13 08 26  LMP  ... ... --
04 13 08 54  LMP  Man, that's it.
04 13 08 56  CDR  I'm going to maneuver to the yaw. Can you imagine how sporty this little monster is going to be without descent stage?
04 13 09 02  LMP  I know. I don't even want to think about it.
04 13 09 19  LMP  That's it, babe.
04 13 09 21  CDR  Until later.
04 13 09 25  CDR  Inverter 1 going closed.
04 13 09 27  LMP    Okay.
04 13 09 28  CDR    That time must be 2:97 and that's what it is.
04 13 09 31  LMP    Yes.
04 13 09 32  CDR    Inverter 1, closed.
04 13 09 34  LMP    Going closed. Closed.
04 13 09 39  LMP    Okay, we know those. Okay, AUTO - AUTO maneuver; verify burn attitude.
04 13 09 49  CDR    MODE SELECT to PGNS.
04 13 09 51  LMP    What's this other?
04 13 09 52  CDR    RATE METER to what, RANGE/RANGE RATE?
04 13 09 56  LMP    Set the tapemeter. RR dot.
04 13 09 58  CDR    TAPE METER switch, RANGE/RANGE RATE. I don't know what - MODE SELECT, PGNS. TELEMETRY, HIGH; VERB 47 at 53. You might want to do it at 52 because it takes so long.
04 13 10 12  LMP    Yes.
04 13 10 22  CDR    ... ... 
04 13 10 28  LMP    That would be fantastic, Pete, babe. We don't have a lot to do between DOI and PDI, do we?
04 13 10 41  CDR    No.
04 13 10 42  LMP    Let me look at this thing 1 second.
04 13 10 45  CDR    Hey, don't let me do anything unsafe now. I'm not even going to watch.
04 13 10 49  LMP    If I get - I get, no but - I mean if I get to concentrating on something.
04 13 10 53  CDR    I'll be helping you.
04 13 10 54  LMP    Yes. That's the reason I'm with you. Don't even think about me.
God damn, this suit is tight. I've sure got a tight suit, that's for darn sure.

Put that in there, Pete.

This damn thing is more trouble than it's worth.

Don't tire yourself out on a stupid-ass camera like that. Locked in?

Not yet, will be. Hold that.

Just didn't want to screw with it later, Pete.

Okay.

I don't want to —

Here's your eye patch.

Okay, I just didn't want to fool with it later. Put it up here.

Catch that clip?

Huh?

Catch that clip. Thank you.


Well, turn up the lights. I don't know what the hell - We're conserving electrical power or something. I don't know whether I'm right-side-up or upside down in this damn inertial world. I could tell myself, though, right now, if I took a quick peek.

Okay, that's that.

Okay, Al, babe.

Okay.

TELEMETRY, HIGH.
Okay.
4:14.
Yes.
Have you got the TELEMETRY, HIGH?
I will in just a second.
All right. Plenty of time. Are you through?
I'm going to do this right on time, right after we pass 52.
All right.
Go, babe.
Yes, I got --
I know. Whenever you want.
I want to give that the best chance possible, too.
I know it.
Your AGS CAL was good. So that thing ought to stay on pretty damn well.
Okay, I'm going to shut it across the --
Now.
Shut it.
Boy, that did it fast, didn't it?
Yes.
TELEMETRY, LOW.
MODE SELECT, PGNS. There you go. 1.59, I've got 1.6. I've got half and you've got 0.8. That's good.
Okay. Now, VERB 40, NOUN 20, ENTER.
Okay, I'm going to trim.

Okay.

Thinks we're there, huh?

You're in AUTO, I guess.

Yes. I trim again at 55.

That's better. That's better, Pete.

Oh, yes. Just like the simulator.

I got it in; didn't forget it.

We'll be coming out in daylight on this burn, huh?

How about me giving you this card again, old chap?

Wait 1.

In case you've forgotten anything.

Yes, wait 1. Go right on schedule, here.

You said it.

All right. Now you're talking my language.

Okay. PRO; ENTER; ENTER. There it is. Okay, give me the card again.

Hey, how about your 407?

I'm watching it.

Okay. ... see it.

CB(11).

- - ... - -

DECA GIMBAL AC. All right, when you get the 4 minutes, we're --

CONFIDENTIAL
04 13 19 10 CDR -- Hey, hey, yes. Let's get it at --
04 13 19 12 LMP DECA GIMBAL AC --
04 13 19 13 CDR Wait. Get that clock. I want the clock. I really do.
04 13 19 17 LMP DECA GIMBAL AC --
04 13 19 18 CDR Stop.
04 13 19 19 LMP Okay.
04 13 19 20 CDR I'll have to reset.
04 13 19 21 LMP 56 set it at.
04 13 19 22 CDR 56.
04 13 19 27 CDR Plenty of time. Got it?
04 13 19 34 LMP That says zero under the second.
04 13 19 36 CDR 1, 2, ...
04 13 19 38 LMP/CDR Zero -
04 13 19 39 LMP Set.
04 13 19 40 CDR Well, hell, you shouldn't have done that.
04 13 19 43 LMP It was perfect.
04 13 19 44 CDR Oh, you got it?
04 13 19 45 LMP Yes.
04 13 19 48 CDR Yes. Tell you what, when the one disappears is when you want to flip it.
04 13 19 52 LMP -- ...
04 13 19 53 CDR -- Yes. Yes. About half a second out --
04 13 19 54 LMP -- Let's do that. Give me the DPS card again. DECA GIMBAL AC.
04 13 19 58 CDR DECA GIMBAL AC, closed.
04 13 20 01 LMP STABILIZATION/CONTROL all closed except AEA, AELD, and ABORT STAGE.
AELD, ABORT STAGE, and AEA are out.
RATE SCALE 5 degrees a SECOND.
Right.
THROTTLE CONTROL, MANUAL; COMMANDER.
MANUAL; COMMANDER.
ATTITUDE TRANSLATION, -
4 jet.
4 jet. BALANCE COUPLE, on.
ON.
ENGINE GIMBAL, enable.
Yes.
DESCENT ENG COMMAND OVERRIDE, off.
Yes.
ABORT, ABORT STAGE, reset.
Reset.
DEADBAND, MIN ATTITUDE, three to MODE CONTROL.
Yes.
Mode control -
AUTO, ATT hold.
That's right. STOP push buttons, reset; THROTTLE, MIN; 400 plus 1; ENGINE ARM, DESCENT, at 30. Ullage - ullage at -
Now - now, we're standing by for a MASTER ARM -
At 29.
Now turn this - No, no, don't turn this damn thing over. Just leave it right there.
04 13 20 47 LMP 500 readout. Coming up on, let's see how many
degrees I'm off. Oh, ... at your second?

04 13 21 00 CDR Yes. That's good. You're just coming in in ORB
RATE.

04 13 21 06 LMP Okay. COMMAND in ATT HOLD.

04 13 21 09 CDR Yes.

04 13 21 10 LMP I'll check it again about one - Let's see what we
got here.

04 13 21 12 CDR Got to get MASTER ARM on here.

04 13 21 16 LMP Have you got MASTER ARM that goes at 1?

04 13 21 18 CDR Yes.

04 13 21 20 LMP And I gather you've done the final trim, that's
done, CONFIG 407. Standing by for MASTER ARM,
and PRO. And I'm going to count off 31 seconds.
I don't know about you.

04 13 21 40 CDR This goddamned clock is out of SYNC.

04 13 21 43 LMP What the heck, don't worry about it. 29 seconds
burn time, huh?

04 13 21 47 CDR Yes.

04 13 21 51 LMP Over to - Looking for 31.

04 13 21 53 CDR The only other thing that bothers me is that
ENGINE COMMAND in THRUST. That is the one -
Doesn't it usually keep reading 10 percent all the
time in the simulator?

04 13 22 02 LMP Only in AUTO.

04 13 22 04 CDR Only with AUTO?

04 13 22 05 LMP Yes.

04 13 22 06 CDR Oh, you're right. Okay.

04 13 22 13 LMP One minute MASTER ARM on and I'll set my watch.
Okay. My MASTER ARM's coming on. It's on.

Okay.

I'm ready to burn.

All right.

ENGINE ARM to DESCENT at 30 seconds.

One minute. We just passed 1 minute, Yankee Clipper.

Okay, Pete. Right with you.

Coming in, Pete.

I'll go over to VOX for you, so you can hear it, Dick. How do you read me?

...  

Okay.

ENGINE ARM, DESCENT, at 30, Pete.

What happened to the COMM? Do you hear me?

Yes. Just keep flying. Do you hear me?

Yes, sir. Go.

DESCENT ENGINE's armed.

Stand by to PRO at 5.

Standing by for ullage.

Looking for 31 in AGS here. I'll watch mine.

I got 10 percent on the Commander gage. 10, 9, 8, ullage, 6, 5, flashing 99, ENGINES armed, 2, 1.

IGNITION.

It's burning; looks good. To - what? 15 seconds?
15 seconds you go to 40 percent.

15 seconds, 7, 8, 9, 10, 11, 12, 13, 14, 15.

Go to 40, babe.

30 percent.

Okay, now --

18, 19, 21, 2, 3, 4, 5, 6, 7, 8 --

SHUTDOWN.

Okay. Looks good.

Okay. Look at all the --

ENGINE ARM, OFF.

Ah, that's a good burn.

ENGINE ARM, OFF.

ENGINE ARM, OFF.

MASTER ARM, OFF.

MASTER ARM, OFF.

Do not trim.

What?

Do not trim; PRO, PRO, PRO. And I'll write them down.

PRO.

Tell me what they are.

(Laughter) Zero, plus 2, minus 6.

I have you -- I have you in the sextant looking right at your descent engine.

Okay. What PO0? What do we go to, PO0?
PRO, PRO, and PO0. And you take this, please?
Okay.
The burn, Pete, babe. That's the way to do it. Look at that. Look at the stars we made.
Yes, I know.
500.
MODE CONTROL both ATT HOLD.
ATT HOLD. PGNS are residual.
What were they?
I got them right here.
Zero. Zero, plus 2, and minus 6. Well, Pete, that was nice. Hey, that thing --
Did your AGS agree? What?
It agrees with the minus 6; it agrees plus 1; but I'd say that you -- you need a little - three more tenths feet per second --
-- Okay. But the point is we don't trim, we don't need to lock on the --
-- that's right.
-- rendezvous radar or anything. Right?
That's exactly right, babe.
Okay. The next thing is a VERB 82, ENTER.
I'm going over to the PDI PAD. And I'm going to stand by for this.
60.5 by 8.9.
... 10 plus all zeros.
VHF A XMITTER to VOICE/RANGE.
04 13 25 47  LMP  VOICE/RANGE.
04 13 25 48  CDR  VHF B XMITTER, OFF.
04 13 25 50  LMP  XMITTER, OFF.
04 13 25 51  CDR  Going to PROPELLANT QUANTITY MONITOR, OFF.
04 13 25 55  LMP  PROPELLANT QUANTITY MONITOR, OFF. You did that?
04 13 25 58  CDR  Yes. Pitch to zero, 109. Okay. 109 from ***
hundred is what? ...
04 13 26 17  LMP  He's still on VOX, Pete.
04 13 26 19  CDR  Yes.
04 13 26 20  LMP  Don't forget.
04 13 26 21  CDR  Yes.
04 13 26 42  CDR  Let me do the VERB 48, ENTER; VERB 21, ENTER;
21112, ENTER; PRO; VERB 34, ENTER.
04 13 27 07  CDR  Hey, Dick, that was really a super burn.
04 13 27 10  CMP  What's that?
04 13 27 12  CDR  It was really a super burn. Right on the money.
04 13 27 15  LMP  You - you didn't give me a VERB 82, babe.
04 13 27 16  CDR  Yes, I did. There it is right there, 60.5 by 8.9.
04 13 27 20  CMP  Okay. Give me VHF ranging, will you, Pete?
04 13 27 23  LMP  We've given it to him.
04 13 27 24  CDR  Okay.
04 13 27 25  LMP  He's got it.
04 13 27 26  CDR  You got it.
04 13 27 35  LMP  ... point ...
04 13 27 40  CDR  You got it, Dick?

CONFIDENTIAL
04 13 27 42 CMP Yes, I've got it. Clear to a half a mile.
04 13 27 54 CDR Okay. Turn the lights down.
04 13 27 56 LMP Jesus Christmas! You ought to see the DSKY.
04 13 28 22 LMP Verify loose gear stowed; restraints detached.
04 13 28 26 CDR It is. PCM, HIGH; BIOMED, RIGHT. You got the sequence camera?
04 13 28 36 LMP I've got it.
04 13 28 37 CDR The COAS goes to the overhead window.
04 13 28 40 LMP That Sun got in the way.
04 13 28 41 CDR Man, there's the lunar surface.
04 13 28 46 LMP We're going down, Pete, babe.
04 13 28 47 CDR Yes, I know.
04 13 28 48 LMP Fly that thing in there.
04 13 28 53 CDR I'll do my best.
04 13 28 54 LMP I know it.
04 13 28 56 CDR I just hope it's enough. What in the hell is that?
04 13 29 00 LMP Where?
04 13 29 01 CDR What in Christ's name is this?
04 13 29 02 LMP That's the plug, they put them in there. Just slide it out.
04 13 29 06 CDR What is it?
04 13 29 07 LMP I'll get it.
04 13 29 08 LMP It's just a dummy plug.
04 13 29 10 CDR Jesus Christ, I never saw that before either.
... don't want any electrical thingamajigs to get in. You're supposed to put it in the — back in the front window. You want to do it? Okay? See, that fills up the slots.

Great.

Hey ... Oh, beautiful, Pete. Okay. If you can't look out, I ain't going to look out.

Nothing for me to do right now. Not a thing I can do, Pete.

You locked on with the rendezvous radar?

No, why?

I didn't know if — because you will be down in here for this perilune. I don't think it's —

I didn't need it for the other.

I know it. I know. I just didn't know if you were yet. What a machine. What a machine!

That's it, pal. You're in a DOI attitude, 01090.

Target FGNS for PDI plus 12 abort.

Okay, here you go. Shoot it to me.

Stay loose and I will. Need some time's, I bet.

Yes.

Try 110:32:04.70.

01.

10.


All zips.
04 13 30 55 LMP  Plus 0131.0, 310. You got that. That's it. It ought to give you about a 1.7 by 13, roughly.

04 13 31 17 CMP  ... 60.9 by 9. ...

04 13 31 21 CDR  Roger. I got 60.5 by 8.9, Dick. Very good. Are you tracking me in the sextant?

04 13 31 27 CMP  ... not yet. I've just got that 76 up.

04 13 31 30 CDR  Oh, okay. I'm in the PDI attitude at this time. How much fuel have I got left?

04 13 31 38 LMP  You're so good, it's fantastic. What are you talking about?

04 13 31 44 CDR  That's got to be - that's got to be all volcanic down there.

04 13 31 54 LMP  Okay. 146, that's good. 13, that's good enough. Forget it. We ain't doing that one.

04 13 32 04 CDR  Lets hope not. Okay. What's next? DOI postburn report; helmets and gloves on; CABIN REPRESS, CLOSE; suit gas diverter, EGRESS.

04 13 32 18 LMP  Pete, you ought to move this, because I was looking; that thing could fall off there and hit your DSKY now. You ought to put somewhere else.

04 13 32 23 CDR  Well, you can take it and put it away for all I give a shit right now.

04 13 32 37 CDR  Well, that's complicated.

04 13 32 38 CMP  ... you're moving across that surface.

04 13 32 42 LMP  Look at that. Look at that thing.

04 13 32 43 CDR  Yes, I can tell we're going down, too.

04 13 32 44 LMP  Look at that thing. Put it in - put it over in there, Pete, in one of those bags, urine bag or something like that. We'll get it later.

04 13 33 15 LMP  Guess when you get down to it, I ought to do that same thing to mine.
04 13 33 19 CDR  No, let's don't; too much trouble.
04 13 33 21 LMP  Why? Why? Grab it right down —
04 13 33 29 CDR  — Something else that I've got to do right now, too.
04 13 33 31 LMP  Okay. I can grab them like this. Okay. Okay, now. Have you got clock counting up or down or something?
04 13 33 40 CDR  No, I'm not counting any which way. We ought to get - What was the PDI time?
04 13 33 45 LMP  PDI time. Let me give it to you, babe. 110:20:37.
04 13 33 50 CDR  1101 —
04 13 33 51 LMP  20
04 13 33 53 CDR  110:20 —
04 13 33 55 LMP  So that's 20 minutes plus - Just a minute. It's going to be 35 in a minute. So, that would be 25 and 20. 45. Put 45 in there. No, no, no, no. I goofed it. Put 15 in there. We want it counting up. I goofed. That's it. Now I'll tell you when. Not - no, no. The time has got to get to 35 something, so it's got to get to 35:37. So I'll watch it. Okay?
04 13 34 26 CDR  Yes. I need another shot of cold.
04 13 34 32 LMP  Okay. I'd like a shot of cold water, but that's out of the picture. There's a little. It's liable to come in too strong, babe. Let me look at this suit CRIT.
04 13 34 42 CDR  When do we - when do we get acquisition?
We get it right here.

109:43, huh?

9 minutes.

Okay. Man, Dick. We're in the PDI attitude, which is heads down going forwards right now. And it looks like we're just making a big dive into the lunar surface.

I understand. I got you.

Did you see that engine burn?

Yes.

All the pressures good and everything?

Yes. 35. Just a second. I'm going to get it --

And I got to put that to AUTO right now.

-- ... --

Before I forget it.

That's a smart idea.

Anything else I got to do?

...

All those pressures okay. Super CRIT. Take a look at them. Ambient, 450.

...

Okay. You like the way it looks, Old Shoe?

Yes, sir.

I may as well go get the MODE 2.

Lord God no, I don't want to do - Yes, do I? No, I don't want to do - Do I want to do that now? No.

Get on the time line.
04 13 36 00 CDR You got the clock counting up? 45 minutes from 35 minutes is 25 is no. What time did you say the time was? PDI? 110:20. You're going to have to fold that over and lift it up by the camera - by the camera and in. Now hold -

04 13 36 24 LMP I just want it to sit here a minute. Dick didn't roll good enough. I got to roll it.

04 13 36 36 LMP It doesn't want to roll.

04 13 37 18 LMP 28500.

04 13 37 23 CDR Just say you see the Snowman peak, babe.

04 13 37 36 LMP I changed my mind.

04 13 37 39 CDR Yes. Get rid of that.

04 13 37 40 LMP Liable to break my finger or something?

04 13 37 42 CDR Yes. Let me have it. I'll get rid of it for you.

04 13 37 46 LMP Hold this - hold this end.

04 13 37 53 CDR Oh boy, we really do use descent water, though. We're down to 85 percent right now.

04 13 38 03 LMP I got to get up a little higher.

04 13 38 05 CDR Okay.

04 13 38 11 LMP Here you go. ... that baby away.

04 13 38 13 CDR Yes.

04 13 38 14 CDR But we sure don't need something else in the way. Got her?

04 13 38 17 CDR Yes.

04 13 38 23 LMP 110:20:37. Okay. It's going to be - it's 38. So 38 to 60 is 22.

04 13 38 33 CDR We've got to put these dumb - Don't forget to put these lunar -

04 13 38 35 LMP -- 22 - 42.
04 13 38 36 CDR  --- ... compartment.
04 13 38 37 LMP  42.
04 13 38 38 CDR  Huh?
04 13 38 39 LMP  42.
04 13 38 40 CDR  Okay.
04 13 38 41 LMP  We won't - we have to get those out to use them at night anyway, Pete. We'll move them. Okay, now, what have we got?
04 13 38 46 CDR  At night?
04 13 38 49 LMP  Sequence camera. I've got that son of a gun set so good it stinks. If I can just start it now at the ... moment.
04 13 38 55 CDR  Hey, hey - why don't you go ahead and button us up? Cabin REPRESS, close?
04 13 39 01 LMP  The thing will blow you down a bit, but that's okay. Cabin REPRESS, close. Now what? EGRESS?
04 13 39 07 CDR  SUIT GAS DIVERTER, EGRESS.
04 13 39 10 LMP  SUIT GAS DIVERTER, EGRESS. Okay.
04 13 39 15 CDR  CABIN GAS RETURN, EGRESS.
04 13 39 17 LMP  CABIN GAS RETURN, EGRESS.
04 13 39 19 CDR  CABIN REG's A and B, EGRESS.
04 13 39 22 LMP  ... you to go, baby.
04 13 39 24 CDR  UPDATA LINK switch to DATA. Just as soon as we get those, we need - we get them in 4 more minutes.
04 13 39 33 LMP  --- ... ---
04 13 39 34 CDR  As a matter of fact, we ought to see them come up ov - o - o in front of us.
04 13 39 37 LMP  Yes. Now watch this, Pete.
04 13 39 39 CDR
What? You got that in.

04 13 39 44 LMP
Yes, sir. Okay. We're standing by to do that. Hey, what's our pitch attitude?

04 13 39 51 CDR
109.

04 13 39 52 LMP
109. It's about 14 and minus 2.

04 13 39 55 CDR
That's what I've got. I'm watching for them to come up on the - on the horizon and see earthrise.

04 13 40 01 LMP
Wish I could shoot that shot. It'd be - Live forever in the annals of our own personal goodwill. Coming up for PDI.

04 13 40 12 LMP
... got anything tight right here?

04 13 40 14 CDR
No.

04 13 40 15 LMP
We'd do that and become famous for this.

04 13 40 25 LMP
250.

04 13 40 26 CDR
Just a minute. ...

04 13 40 29 LMP
Could make us both famous right here.

04 13 40 40 CDR
I didn't write down the AOS plan, did you?

04 13 40 44 LMP
You wrote it down, Pete. You wrote it down on that other page. But, hell, what difference does it make? It's right - in a minute. We're going to see them come up.

04 13 40 55 CDR
43:30.

04 13 40 56 LMP
Can you hear us, Dick?

04 13 40 58 CMP
Yes. I can hear you.

04 13 41 00 CDR
You know. It doesn't look any closer to me down here than it does at 60 miles. I frankly can't tell the difference.

04 13 41 09 CMP
May not be closer to you.
Maybe that's it. Heck, I don't know.

I don't imagine we've come down more than 5 or 6 miles.

I'll look at it right now. The AGS thinks we're at 50 - 50 miles.

Yes.

The AGS thinks we're 50 miles, Dick.

If we take this picture it'll be famous forever; even better than when we grab the Surveyor by all of its parts, dismantling it handily.

Is everything tucked away? Anything going to fall on our heads?

Going to have to go to inverter 1 some day. Did you check off those good things I did?

S-BAND ANTENNA is FORWARD. Right?

Check off the good things I did. You did. We did.

All right. COAS is to the overhead window; DOI postburn report we'll get; helmets and gloves are ON; CABIN REPRESS is closed; suit gas diverter to EGRESS; EGRESS; CABIN REG's A and B, EGRESS; and we're standing by for the UPDATA LINK switch. We're going to get earthrise in just a second. You ought to have earthrise by now, Dick.

... be a while yet because I'm looking backwards.

Oh, that's right. I forgot.

It's going to be at 109:43:30. It's going to be right straight out there or what, I wonder? I'm kind of guessing it is.

Or maybe, would it --

Yes.
-- maybe the 15-degree inclination's going to do something to it. I just always imagined it was right in front of us.

15 more seconds. There - No. I thought I saw it coming up. 9 - 30 seconds.

Starting --

There it is! Look at it! Goldarn! Watch it - just - keep - just click them off. Oh, that is fantastic!

Hello, Houston; Clipper.

Give them high gain, Al.

They haven't got us yet, Pete.

Oh, okay.

But I'll go over on it and we'll make it --

Roger. Good burn. Good burn.

You can get some more pictures if you want.

I'm getting them right now.

God dog!

Tell them about it, babe.

f:ll, 250 is what we've been using, isn't it, Pete?

Yes, yes.

That's got to be so fantastic.

Hello, Houston; Intrepid.

Intrepid, Houston. How do you read?

Roger. We read you loud and clear, and we just watched our first earthrise, which was fantastic! And we had a great DOI burn. The X residual was zero; Y was plus 0.2; and Z was minus 0.6.
Roger, Pete. Copy your residuals. X is zero; Y, plus 2 - 0.2; and Z, minus 0.6.

That's Charlie.

Intrepid, Houston. What were your AGS residuals? Over.

Coming at you; 1 second.

AGS residuals were plus 0.3, plus 0.1, and minus 0.6.

Roger, Al. Intrepid, Houston. We have your steerable now. Could you give us HIGH BIT RATE?

Roger. Going to HIGH BIT RATE.

What else do we need to give him? BIOMED?

BIOMED, RIGHT; FCM, HIGH; and UPDATA LINK switch to DATA whenever they're ready.

Adios, babe. Going to put this away.

Okay.

Time to get down to business.

Yes.

Don't lose that picture. That's going to be one that's going to hang around for years. I don't give a shit if it's - streaked.

Okay, I'm going to go ahead and get my - No, I'll wait - until I get the computer.

Hey, I didn't give them DATA.

No, they - they didn't ask for it yet.

Oh, man, you scared me.

And, Houston, whenever you're ready, we're ready to give you POO and DATA.
04 13 46 49 LMP  Where's my pen?
04 13 46 53 CC   Roger, Intrepid.
04 13 46 57 LMP  See a pen floating around here anywhere, Pete?
04 13 46 59 CDR  Sure don't.
04 13 47 02 LMP  I got it. I got two of them (laughter). Okay, hang in there, babe. Hang in there. PCM, HIGH; BIOMED, RIGHT. Set sequence camera. I did. That's all done.
04 13 47 26 LMP  Helmets and gloves on; CABIN REPRESS is closed. And we're right here.
04 13 47 34 CDR  Yes. But I got to get the UPDATA LINK first. Can't go on without that.
04 13 47 43 LMP  I know it. VHF ANTENNA, FORWARD. It is. Select INVERTER 1. Wait - wait - don't select INVERTER 1 yet, Pete. Have you got your INVERTER 1 circuit breaker off?
04 13 47 59 CDR  I sure do.
04 13 48 01 LMP  Coming over to ac and I'm going to INVERTER 1. I've got it. Okay. See that guard? That's a - that's a bad one, boy. You could flip that out so easy. I've been worried about that one for months.
04 13 48 18 CDR  Okay, let's get the AELD's closed and ABORT STAGES closed.
04 13 48 23 LMP  I don't think we ought to do that. Cycle the CWEA.
04 13 48 27 CDR  AELD, ABORT STAGE.
04 13 48 30 LMP  Here comes the CWEA cycle.
04 13 48 40 CDR  I never used the STOP button. The window bars are set.
04 13 48 46 CC   Intrepid, Houston. Would you put your BIOMED switch LEFT?
04 13 48 51 CDR  Okay, going BIOMED, LEFT.
04 13 48 53 LMP  Had a feeling they were going to want that.
04 13 49 08 CDR  How soon before you're going to send up the data, Houston?
04 13 49 13 LMP  THROTTLE, MIN.
04 13 49 15 CDR  MIN.
04 13 49 16 CC   About 1 minute, Pete.
04 13 49 18 CDR  Okay, I'll hold then. We're standing right by to do the mode 2 lockon to radar and so we're holding.
04 13 49 32 CMP  Roger. Go ahead.
04 13 49 36 CC   Roger. LOS 110:55: --
04 13 49 41 LMP  Mode 2 lockon.
04 13 49 42 CDR  What?
04 13 49 43 LMP  Mode 2 lockon.
04 13 49 44 CDR  Yes. That's where I'm holding right now. I don't want to use the computer. I'm waiting for them to uplink. They should have uplinked.
04 13 49 52 CC   -- 41:32. Over.
04 13 49 57 CMP  Roger. Copy.
04 13 50 26 CDR  In 5 minutes, you got to put on the BAT's.
04 13 50 28 LMP  Okay. Let's see if this 30 minutes works out.
04 13 50 30 CDR  Yes.
04 13 50 31 LMP  You tell me what time 30 minutes more is. And I'll tell you if that's right.
04 13 50 40 CDR  50:37. It'll be 20:37.
That's right, babe.

Intrepid, Houston. Go POO and DATA. We're ready to go.

We got it; POO and DATA for you. Go ahead.

Roger. It's on the way.

Hang it in there, Pete, babe. Hang in there.

You're about 30 degrees above our horizon now, Houston. And you're about one-third-crescent Moon, and you really are beautiful. See blues and whites.

Roger, Al. Put on our Sunday best for you.

We're pretty well suited out up here ourselves (laughter).

Boy, this thing sure flies nice.

Hey, does it still look like we're 5 miles north?


Okay. What kind of an azimuth with respect to the Sun will I have on that - Is it that little that I'm not going to notice it?

You're cutting in and out slightly, Pete.

Just like you landed anytime on Earth, Pete.

Stand by, Pete. We're checking with the experts.

Okay.
04 13 53 03 LMP  I'm not kidding.
04 13 53 04 CDR  What?
04 13 53 05 LMP  The closer I get, the more I feel like it's just like landing on Earth. Just let it fly down and park it somewhere. We'll bound out and grab a rock.
04 13 53 36 LMP  Okay.
04 13 53 45 LMP  Let me read the PDI rules to you.
04 13 53 47 CDR  Okay.
04 13 53 48 LMP  No ullage, NO-GO for PDI.
04 13 53 50 CDR  Yes.
04 13 53 51 LMP  No ignition, delay 5 seconds; then set descent engine override, on. Thruster rate; okay, 5 degrees. ...
04 13 53 58 CC  Intrepid, Houston. The computer's yours.
04 13 54 01 LMP  Very good. When I went to VOICE BACKUP, it whistles.
04 13 54 13 LMP  Houston, Intrepid. When I went my UPDATA LINK to VOICE BACKUP, it made a whistle on our COMM, so I'm just going to leave it off.
04 13 54 24 CC  Roger, Al.
04 13 54 26 CDR  Keep reading.
04 13 54 32 LMP  What can I do to help you, Pete? Let me cross them off for you.
04 13 54 43 CDR  Okay.
04 13 54 44 CC  Intrepid, Houston.
Go.

Roger. Now that you got a new RLS, we've got a new address 231 for you.

Go.

Okay. 231 is plus 56957.

Plus 56957. Roger.

Coming at you with the radar, Dick.

Roger.

Okay. Okay.

Intrepid, Houston. That whistle you heard, we think, was because we were still commanding. They'd like to have you try it again.

Just tried it - Looks good. I'm in VOICE BACKUP then. Coming on with those BAT's.

Yes.

5 and 6, Pete.

Yes.

Ascent BAT's coming on.

Roger, Intrepid.

And we got a mode 2 lock.

Okay, I'm ready to - ready for an altitude check as soon as you can give it to me.

Okay. You got 36 minutes?
You said it.

Your chart goes that low, huh?

Hell, yes.

All right, I'll give you one at 37 minutes.

All right.

How about 36-1/2?

How about 37?

Okay. 37 it is.

What's it going to be, roughly?

Looks like it's going to be around 290 to 295, something like that. Sound about right?

295 would put us about 56 thou.

It's going - It's going to be - It's not going to be that high.

Maybe that's that type where you can't - Don't bother. ... do it. Just screw it, who cares.

Yes.

I don't think that's worth a damn anyhow. Okay. Give me a 37 one.

293.

Give me one at every minute.

Yes.
Houston, our first perilune altitude check, using
the tapemeter, shows that it's going to be about
57500.

Roger, Al. Copy.

Do you concur or not?

Houston, Clipper.

Got a --

Houston, Clipper.

Got another one.

Okay.

Stand by, Intrepid. We're checking. Break.
Clipper, go ahead.

Roger, Jerry. Could you send me a good LM state
vector, please?

What we got to do, Pete?

Stand by.

MARK.

306.

Second check shows it to be 59 000 feet.

Roger, Al. Clipper, Houston. We think it probably
won't do you much good to have it right now. It'd
be better later.

Okay.

Clipper and Houston are clearing good.

Man, this suit is too tight.

No, that's funny; you're going to love it. You're
going to be like a bunny rabbit. Just slow you
down.
04 13 59 25  IMP  By-by, Earth. S-band antenna better be grabbing that baby.

04 13 59 31  CDR  Okay. Stand by.

04 13 59 32  LMP  Hang on there. Okay.

04 13 59 36  CC  Intrepid, Houston. We're still looking at a perilune of 50 000.

04 13 59 39  CDR  MARK.

04 13 59 40  CDR  320. Okay.

04 13 59 53  LMP  320 shows that? Something's screwy. Something's wrong. Our third one shows it's going to be 64 000. It's - just making kind of a sweep up. Might be this tape meter problem we saw on our self-check.

04 14 00 15  CC  Roger.

04 14 00 20  CDR  So I got to go VERB 37, ENTER; 63, ENTER.

04 14 00 26  IMP  Okay. That's what you're doing?

04 14 00 31  CDR  Yes.

04 14 00 36  LMP  We don't - We don't need to do any of those things. Damn bit of difference.

04 14 00 41  CDR  No, I'm going to kill it right now.

04 14 00 44  LMP  I'm game; kill it.

04 14 00 45  CDR  RENDEZVOUS RADAR to SLEW; SLEW, two of them, are open.

04 14 00 52  LMP  Okay. TM ALTITUDE, ALTITUDE/RATE.

04 14 00 56  CDR  Okay. That's done. Okay, I show 19 minutes and 36 seconds. Off by 1 second.

04 14 01 10  IMP  Okay. Do you want me to set it?

04 14 01 11  CDR  Yes. Just set it to 41.

04 14 01 25  LMP  Say when. You punch it.
04 14 01 39 LMP 41, that tells me that there's exactly 19 minutes
to go. That's good. All right. Everything's okay.

04 14 01 45 CDR All right. Now -

04 14 01 47 LMP Let me do this. What do I do here? See, it doesn't
look any worse down low that it does high up.

04 14 02 01 CDR Okay, Houston. Are you looking at P63?

04 14 02 09 CC That's affirmative, Pete.

04 14 02 11 CDR If you got enough, I'll go back to POO.

04 14 02 14 LMP Did you do that?

04 14 02 15 CC Stand by.

04 14 02 18 CDR Yes, I did.

04 14 02 19 CC Okay, Pete. Go to POO.

04 14 02 25 LMP How about a little burn abort rules, babe?

04 14 02 27 CDR Okay.

04 14 02 28 LMP I've already given them to you, forget it.

04 14 02 29 CDR RENDEZVOUS RADAR ... two V's ... --

04 14 02 32 LMP No. Let me - let me finish them.

04 14 02 33 CDR Wait a minute. SLEW make sure those bastards are
open. 1, 2, they're open.

04 14 02 38 LMP And the landing radar, how's it doing?

04 14 02 40 CDR I don't turn it on yet; it's --

04 14 02 41 LMP -- Okay, okay. Now let me read them to you.

04 14 02 45 CDR Okay.

04 14 02 46 LMP I've read part of them. DELTA-H within limits
greater than 10 seconds and not out of limits greater
than 60. BETA good at greater than 10 grand.

04 14 02 56 CDR Yes.
If no throttledown by P64 plus 15, abort. ... fuel 1 minute 34 seconds after a low level or when fuel quantity less than 2, unless landing imminent. Well, you know that.

Yes.

For flashing LANDING RADAR, ALTITUDE, or VELOCITY lights that are preceded by 30-cycle RADAR TEST switch. Okay. That's it.

The hell we aren't getting low.

Don't think about it, it's easier.

Hum.

What's that whistling anyhow? What is that?

I don't know.

Hope your pulse is lower than mine.

It's not too bad right at the moment.

We look real good up here, Houston. How you feeling down there?

Intrepid, Houston. We're feeling great.

Intrepid, Houston.

Go ahead.

Roger, Pete. On this Sun angle, or Sun azimuth - As far as we can see, there'll be no noticeable difference as far as you're concerned. All you got to do is watch out and not fly through any clouds.

Okay. I'll stay away from the clouds, and we're looking for the Snowman.

Roger.

45 minutes, perilune altitude checks, RENDEZVOUS RADAR, CB, for the 99th time, they're both open (laughter).
Okay. Touché.

The switch is in SLEW.

P63.

Put your program alarm card out here and your — slip that under your thing so you can honk that baby out, if we need it. Okay?

I'm game.

Man, there's some mighty big mountains out there. Look at them.

I was just thinking about that while ago. We'll shoot right between a couple of them.

I sure hope you have us lined up right, Houston, because there sure is a big mountains (laughter) right in front of us, right now. I hope we go down the middle. There is one valley (laughter).

Roger, Pete.

Okay, Pete, babe. You're going to see it. Keep saying that. Smoke over your circuit breakers while we wait. Just the other ones.

Okay. DECA GIMBALS, closed.

Now they're all looking good, Pete. Okay, my camera's ready to start.

Man, oh man, we're getting low. Ho, ho, ho.

That's right; you can't land if you don't get down there amongst them.

That's all right. Look at that. I thought it was rela - This must be Fra Mauro we're going over.

Can't tell, Pete.

Say, Houston; where are we? Over Fra Mauro?
Stand by, Pete. We're looking at lines right now; we don't have our map up.

Okay.

I don't want to look.

(Laughter) There's nothing but rocks out there.

I hope we go a lot further on.

We do; we got a long ways to go. Got a - hundreds of miles after PDI, for Christ's sake. Already, we have 170 by 260 something --

260, yes.

49, Pete.

Okay. We've done this so many times, we'd better do it right. Don't let it get out of sight, don't get low, and don't try to fly too hard. I'd like to fly it there on LPD.

That's what I mean. This baby can save gas for us.

I'll try to talk about as much as I do in the doggone simulator. If it looks like the gas is good, I'll say it; if it looks like we're too high or something, I'll say it, but I don't --

Intrepid, Houston. You've probably just passed over Theophilus.

Okay. Pretty darn***there.

Roger. Tell us when you want us to turn on the mirror.

You can turn the mirror on; give me the fox-clipping, and we got the hook down.

Roger.

Interestingly enough, Houston, at this attitude, I still can see the lunar horizon. I have to really peer to find it, but I can see it.

Roger, Pete.

And in 40 seconds, we'll be going to P63.

Roger.

How about the AGS to AUTO, Al?

Not yet, not yet.

Okay.

7 minutes to 37?

Not yet.

Let me trim it up.

Okay, Houston. Here's 50 18 for you.

Okay. Give me a VERB 47 when you can.

Roger, Intrepid. Looks good.

Wait - wait, wait, wait, wait!

That's right.

Good. Go out of there.

What?

That's it.

How about a VERB 40, NOUN 20? Okay?

No.

What?

Not yet.

Okay.
04 14 15 38  CDR  LANDING RADAR's on.
04 14 16 24  LMP  VERB 40, NOUN 20, whenever you want.
04 14 16 30  LMP  (Whisper) 37 - minus 120 - 20.
04 14 16 47  LMP  Did you give me a VERB 40, NOUN 20?
04 14 16 49  CDR  Yes, I did.
04 14 16 50  LMP  Did you get finished?
04 14 16 51  CDR  Yes. We didn't get any transients.
04 14 17 05  CC  Intrepid, Houston. No transients.
04 14 17 07  CDR  Roger.
04 14 17 20  LMP  You get the landing radar on your final trim.
04 14 17 23  CDR  Okay. There it is.
04 14 17 26  LMP  Ready for that DPS card?
04 14 17 27  CDR  Yes.
04 14 17 28  LMP  Okay. Here it goes. CB(ii): DECA A - GIMBAL AC, closed.
04 14 17 33  CDR  Yes.
04 14 17 34  LMP  CB(ii), (16): STAB/CONTROL circuit breakers, all closed.
04 14 17 37  CC  Intrepid, Houston. GO for PDI.
04 14 17 39  CDR  Roger. GO for PDI.
04 14 17 40  LMP  Except the AEA, open.
04 14 17 42  CDR  They're all closed.
04 14 17 43  LMP  Okay. RATE SCALE, 25 DEGREES/SECOND.
04 14 17 45  CDR  It is. Okay.
04 14 17 49  LMP  THROTTLE CONTROL, AUTO; COMMANDER.
04 14 17 51 CDR Yes.
04 14 17 52 LMP ATTITUDE TRANSLATION, 4 JETS.
04 14 17 53 CDR 4 JETS.
04 14 17 54 LMP BAL COUPLE, on.
04 14 17 55 CDR On.
04 14 17 56 LMP ENGINE GIMBAL, enable.
04 14 17 57 CDR Enable.
04 14 17 58 LMP DESCENT ENGINE COMMAND OVERRIDE, OFF.
04 14 17 59 CDR OFF.
04 14 18 00 LMP ABORT, ABORT STAGE, reset.
04 14 18 01 CDR Reset.
04 14 18 02 LMP DEADBAND, MIN.
04 14 18 03 CDR MIN.
04 14 18 04 LMP ATTITUDE CONTROL, three of them, MODE CONTROL.
04 14 18 05 CDR Yes.
04 14 18 06 LMP MODE CONTROL, AUTO, AUTO.
04 14 18 07 CDR Yes.
04 14 18 08 LMP STOP pushbutton's reset.
04 14 18 10 CDR Okay.
04 14 18 11 LMP TTCA THROTTLE, MIN.
04 14 18 12 CDR Right.
04 14 18 13 _2 _400 plus 1; I've done that. I'll check it again.
04 14 18 14 CDR You're going to have to speak louder; I don't
04 14 18 18 LMP  Okay. That's done, Pete.
04 14 18 27 LMP  ENGINE ARM to DESCENT. We can turn it over, can't we?
04 14 18 31 CDR  Wait, let me look; let me look. DPS to Ti_g; got to do that at 59 - descent. Yes, go ahead.
04 14 18 39 LMP  Okay.
04 14 18 40 CDR  Tie her down good; we couldn't loose that; we'd be sunk.
04 14 18 51 LMP  Standing by on the watch.
04 14 18 52 CDR  Okay.
04 14 18 53 LMP  Come up VOX.
04 14 18 54 CDR  Okay.
04 14 18 56 CDR  Hello, Houston; hello, Yankee Clipper; Intrepid's up VOX.
04 14 19 08 CDR  Roger.
04 14 19 29 CDR  On my mark, it'll be 1 minute -
04 14 19 37 CDR  MARK.
04 14 19 38 CDR  One minute.
04 14 19 39 LMP  Watch is started, Pete. Put her in descent at 35 seconds.
04 14 19 59 CDR  Do it at 30, Al.
04 14 20 01 LMP  Okay.
04 14 20 04 CDR  DSKY's blank; average g; DESCENT ENGINE is armed. VE - VE - VELOCITY light -
04 14 20 14 LMP  Got it nice. Steady, couple of lights there.
04 14 20 17 CDR  And an ALTITUDE light.
04 14 20 28 CDR  10, 9, 8 - we have ullage - 7, 6, 5 -
04 14 20 35 CDR/LMF PRO -
04 14 20 39 CDR I have IGNITION.
04 14 20 40 LMF Got a start.
04 14 20 41 CDR 3, 4, 5. DESCENT ENGINE COMMAND OVERRIDE, ON.
04 14 20 45 LMF Hey, throttle up to 26.
04 14 20 48 CDR Yes. Al, I can't hardly hear you for some reason.
04 14 20 51 CC Copy - -
04 14 20 52 CDR Okay. Standing by for throttle up, Houston.
04 14 20 56 LMF Pete, it looks good.
04 14 21 04 CDR Throttle up.
04 14 21 07 LMF It really feels good when it comes up.
04 14 21 18 CDR All right.
04 14 21 19 LMF Helium looks good; regulators look good, here.
04 14 21 21 CDR Okay. Standing by for 1-minute hack.
04 14 21 24 LMF Okay. I've got a little RCS activity, not too much.
04 14 21 37 CDR MARK.
04 14 21 38 CDR One minute. 5208, minus 20, 45 000. ... Looks good.
04 14 21 57 LMF PGNS and AGS are hanging in there.
04 14 22 38 CDR Roger.
04 14 22 40 LMF PGNS and AGS are hanging in. Looks good here.
04 14 22 53 CDR Very good. Very good.
Feels good to be standing up in the g-field again. Okay, 2 minutes and 30 seconds. 4276, minus 53, and 44 700; looks good.

Smoking right down there.

Check that RCS.

Looks good, Pete.

...

We can give them the ED BAT's today.

Yes. Don't forget the ED BAT's today. There you go.

Three minutes.

About 44 feet per second fast, about 6 feet per second low on H-dot, and about 100 feet low on altitude. Looking good.

Okay, Houston. I have an ALTITUDE light out, and a VELOCITY light out. I'm showing minus 918, minus a 1000; looks good. How's it look to you, Houston?

No sooner said than done. Let me know when it converges; I'm going back to my normal displays.

Four minutes.

ED BAT's are GO, Houston.

Roger. ... - -

Roger. Here comes --

Looking good; looking good. AGS are hanging right in there. SUPERCRIT hangs at 1100 or 12 - all the time.

Okay. Smoke over all the gages; check out everything.
<table>
<thead>
<tr>
<th>Time</th>
<th>LMP</th>
<th>CDR</th>
<th>LMP</th>
<th>CDR</th>
<th>LMP</th>
<th>CDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 14 25 05</td>
<td>Okay. RCS looks good; ... looks good - partial pressure CO₂ is its usual zero (laughter). Got a couple of good winners in these two spacecraft.</td>
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<td>04 14 25 05</td>
</tr>
<tr>
<td>04 14 25 19</td>
<td>You maneuvered a bit on that one.</td>
<td>04 14 25 19</td>
<td>You maneuvered a bit on that one.</td>
<td>04 14 25 19</td>
<td>You maneuvered a bit on that one.</td>
<td>04 14 25 19</td>
</tr>
<tr>
<td>04 14 25 24</td>
<td>Yes. I'm getting a fair amount - getting a fair amount of RCS firing; more than I think I should. But how's the gimbal look to you guys, Houston?</td>
<td>04 14 25 24</td>
<td>Yes. I'm getting a fair amount - getting a fair amount of RCS firing; more than I think I should. But how's the gimbal look to you guys, Houston?</td>
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</tr>
<tr>
<td>04 14 25 36</td>
<td>Boy, it's really giving her heck on the RCS; that must be the radar updating.</td>
<td>04 14 25 36</td>
<td>Boy, it's really giving her heck on the RCS; that must be the radar updating.</td>
<td>04 14 25 36</td>
<td>Boy, it's really giving her heck on the RCS; that must be the radar updating.</td>
<td>04 14 25 36</td>
</tr>
<tr>
<td>04 14 25 41</td>
<td>I'll give the AGS an update; it might need it.</td>
<td>04 14 25 41</td>
<td>I'll give the AGS an update; it might need it.</td>
<td>04 14 25 41</td>
<td>I'll give the AGS an update; it might need it.</td>
<td>04 14 25 41</td>
</tr>
<tr>
<td>04 14 25 49</td>
<td>We got her, 6 plus 22.</td>
<td>04 14 25 49</td>
<td>We got her, 6 plus 22.</td>
<td>04 14 25 49</td>
<td>We got her, 6 plus 22.</td>
<td>04 14 25 49</td>
</tr>
<tr>
<td>04 14 25 54</td>
<td>Just gave you a little AGS update. According to this here computer, it's right on the money.</td>
<td>04 14 25 54</td>
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<td>04 14 25 54</td>
</tr>
<tr>
<td>04 14 26 10</td>
<td>Going to turn that sequence camera on in a moment.</td>
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<tr>
<td>04 14 26 23</td>
<td>Okay. 6 plus 22 for throttledown, huh?</td>
<td>04 14 26 23</td>
<td>Okay. 6 plus 22 for throttledown, huh?</td>
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<td>Okay. 6 plus 22 for throttledown, huh?</td>
<td>04 14 26 23</td>
</tr>
<tr>
<td>04 14 26 30</td>
<td>Throttle's down; I'm going to put on the camera. How's that strike you?</td>
<td>04 14 26 30</td>
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</tr>
<tr>
<td>04 14 26 32</td>
<td>Here's 6-minute check - 17.</td>
<td>04 14 26 32</td>
<td>Here's 6-minute check - 17.</td>
<td>04 14 26 32</td>
<td>Here's 6-minute check - 17.</td>
<td>04 14 26 32</td>
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<tr>
<td>Time</td>
<td>CDR</td>
<td>LMP</td>
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<tr>
<td>04 14 26 44</td>
<td>Okay, standing by for throttledown.</td>
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<tr>
<td>04 14 26 52</td>
<td>PGNS and AGS agree - fantastic! 23; let's give it another update.</td>
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<tr>
<td>04 14 27 02</td>
<td>Throttle down!</td>
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<tr>
<td>04 14 27 03</td>
<td>Throttle down!</td>
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<tr>
<td>04 14 27 04</td>
<td>6 plus 23.</td>
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<tr>
<td>04 14 27 09</td>
<td>0 zero, o zero. Give them another AGS update.</td>
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<tr>
<td>04 14 27 16</td>
<td>... I can just barely see the horizon, but ... is really giving it the gazoozie with the RCS, isn't it?</td>
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<tr>
<td>04 14 27 32</td>
<td>Sure is. Why don't I go ahead and put that camera on now?</td>
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<tr>
<td>04 14 27 34</td>
<td>All right. Why don't you?</td>
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<tr>
<td>04 14 27 35</td>
<td>It's running.</td>
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<tr>
<td>04 14 27 37</td>
<td>All right. Seven minutes. Leave that one by me.</td>
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<tr>
<td>04 14 27 39</td>
<td>Okay, 7 minutes. Looks good.</td>
<td></td>
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<tr>
<td>04 14 27 40</td>
<td>Descent fuel 2; it's there.</td>
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<tr>
<td>04 14 27 48</td>
<td>Okay, Pete, 7 minutes. 1153 means you're about 30 feet per second - Wait a minute; let's go ahead and go for 730.</td>
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<tr>
<td>04 14 27 55</td>
<td>Okay. We're out at 19 000 feet. I got some kind of a horizon out there; I got some craters, too, but I don't know where I am yet.</td>
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<tr>
<td>04 14 28 03</td>
<td>730.</td>
<td></td>
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<tr>
<td>04 14 28 06</td>
<td>Smoke over the numbers at 730.</td>
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<tr>
<td>04 14 28 07</td>
<td>Okay, 730, 1153 - not too bad. Plus 135, we're descending a little faster than normal, and we're a little bit low.</td>
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<tr>
<td>04 14 28 19</td>
<td>...</td>
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</tbody>
</table>
04 14 28 20 LMP  
Everything looks good.

04 14 28 22 CDR  
160 feet a second, huh?

04 14 28 25 LMP  
23, we'll be there in a minute.

04 14 28 26 CDR  
Eight minutes. Numbers -

04 14 28 29 LMP  
Numbers running.

04 14 28 41 CDR  
Okay. Passing 12,000 feet, according to our tapemeter, Houston. Spring-loaded to go grab that Surveyor --

04 14 28 53 LMP  
Stop when you're out at 10,000 feet. Hook up your lanyard.

04 14 28 56 CDR  
Okay.

04 14 28 57 LMP  
Standing by for P64.

04 14 29 00 CDR  
Okay. I'm trying to cheat and look out there; I think I see my crater.

04 14 29 06 LMP  
Hey, baby.

04 14 29 07 CDR  
I'm not sure. Coming through 7.

04 14 29 09 LMP  
Look up P60 - P64, Pete.

04 14 29 12 CDR  
P64 - -

04 14 29 13 LMP  
Pitching over.

04 14 29 14 CDR  
- - that's it; there's LPD.

04 14 29 16 LMP  
Okay, there's 6000 update.

04 14 29 17 CDR  
Hey, there it is! There it is! Son of a gun, right down the middle of the road!

04 14 29 23 LMP  
Outstanding. 42 degrees, Pete.

04 14 29 25 CDR  
Hey, it's started right for the center of the crater - -

04 14 29 26 LMP  
42 - -
04 14 29 27 CDR
Look out there. I can't believe it! Amazing! Fantastic!

04 14 29 33 LMP
42 degrees, babe. Guide it in. 42; we're passing 3500. Coming down at about 99 feet a second; you're looking good. About 15-percent fuel; I'll reset my watch here.

04 14 29 45 CDR
Okay. I'm going to flip over one; I just want LPD to the right a little.

04 14 29 47 CC
... landing.

04 14 29 49 CDR
Okay. Roger.

04 14 29 50 LMP
40 degrees LPD, Pete; 40 degrees.

04 14 29 51 CDR
That's so fantastic, I can't believe it.

04 14 29 53 LMP
We're at 2000 feet.

04 14 29 55 CDR
How far?

04 14 29 56 LMP
The boys on the ground do okay. 1800 feet up, 39 degrees. You got 9½ seconds of LP - LPD time left.

04 14 30 03 CDR
Okay, I want up --

04 14 30 06 LMP
38 - 38 degrees, 36 degrees; you're at 1200 feet, Pete.

04 14 30 07 CDR
Okay.

04 14 30 08 LMP
1000 feet coming down at 30; you're looking good. Got 14-percent fuel. Looks good out there, babe; looks good. 32 degrees; you're at 800 feet. 33 degrees, at 680 feet. 33 degrees; 600 feet. Antenna's okay.

04 14 30 34 CDR
Right.

04 14 30 36 LMP
35 degrees; you're at 530 feet, Pete. 530, 471. You're all right! 426.

04 14 30 45 CDR
I got it.
04 14 30 46  LMP  100 - and P66, Pete.
04 14 30 49  CDR  Okay.
04 14 30 50  LMP  P66. Okay, you're at --
04 14 30 53  CDR  Now, I got to get over here to the right.
04 14 30 54  LMP  -- 330 feet coming down at 4.
04 14 30 55  CDR  Got it.
04 14 30 56  LMP  11 percent; got loads of gas. 300 feet, coming
down at 5. Gosh, it went by --
04 14 31 04  CDR  Hey, look at that crater, right where it's sup-
posed to be! Hey, you're beautiful!
04 14 31 08  LMP  10 percent, 257 feet, coming down at 5. 240,
coming down at 5. Hey, you're really maneuvering
around.
04 14 31 17  CDR  Yes.
04 14 31 19  LMP  Come on down, Pete.
04 14 31 20  CDR  Okay.
04 14 31 21  LMP  10-percent fuel. 200 feet, coming down at 3; need
to come on down.
04 14 31 27  CDR  Okay.
04 14 31 29  LMP  190 feet. Come on down; 180 feet. 9 percent;
you're looking good. We'll get some dust before
long.
04 14 31 39  LMP  130 feet. 124 feet, Pete. 120 feet, coming down
at 6. You got 9 percent. 8 percent; you're look-
ing okay. 96 feet, coming down at 6. Slow down
the descent rate.
04 14 31 52 LMP 80 feet - 80 feet, coming down at 4; you're looking good. 70 feet. Looking real good. 63 feet, 60, coming down at 3. 50 feet, coming down. Watch for the dust.

04 14 32 07 CDR 46, 42 feet, coming down at 3.

04 14 32 08 LMP Yes.

04 14 32 11 CC Low level.

04 14 32 12 LMP Coming down at 2, okay. Start the clock. 42 feet, coming down at 2. 40, coming down at 2. Looking good; watch the dust. 31, 32, 30 feet, coming down at 2, Pete; you've got plenty of gas, plenty of gas, babe. Stay in there.

04 14 32 27 LMP 18 feet, coming down at 2. You've got it made. Come on in there. 24 feet.

04 14 32 33 LMP CONTACT LIGHT.

04 14 32 34 LMP It's on.

04 14 32 36 CC Roger.

04 14 32 37 LMP PRO.

04 14 32 38 CDR Yes, PRO.

04 14 32 40 LMP ENGINE ARM, OFF. Okay.

04 14 32 42 CDR Okay.

04 14 32 43 LMP I'll cycle these valves; You got your DESCENT ENGINE COMMAND OVERRIDE, OFF.

04 14 32 47 CDR Yes.
04 14 32 48 LMP  Okey-dokey. I'll cycle the main shutoff valve.
04 14 32 50 CDR  Okay.
04 14 32 51 LMF  SV, close. Get both REG's closed, babe.
04 14 32 55 CDR  The REG's are closed.
04 14 32 56 LMP  Good landing, Pete! Outstanding, man!
04 14 32 58 CDR  MASTER ARM, ON.
04 14 33 00 LMP  Beautiful!
04 14 33 02 CDR  Descent vent, FIRE.
04 14 33 07 CDR  Okay. I'll smoke over the ascents; the ASCENT HELIUM looks okay. Okay, DESCENT REG warning light; don't worry about it. Ascent expendables look good; O₂, H₂O.
04 14 33 23 LMF  This book turned over.
04 14 33 25 CDR  Okay, we're in hot shape, Houston; we're in real good shape.
04 14 33 29 LMF  Okay. Let me go over this. ENGINE STOP, you pushed it?
04 14 33 31 CDR  Yes.
04 14 33 32 LMF  Go. MODE CONTROL, both AUTO.
04 14 33 33 CDR  Both AUTO.
04 14 33 34 LMF  DESCENT ENGINE COMMAND OVERRIDE, OFF.
04 14 33 36 CDR  OFF.
04 14 33 37 LMF  ENGINE ARM, OFF.
04 14 33 38 CDR  OFF.
04 14 33 39 LMF  I got the 413 in, and cycled the Parker valve.
04 14 33 40 CDR  Okay.
THRUSTER ISOL VALVES are done; MAIN SHUTOFF's done; you've vented; MASTER ARM, ON. MASTER ARM, have you turned it off?

MASTER ARM is OFF.

Okay. Just watch the systems, and stand by for a few minutes. Okay.

Man, oh man, Houston. I'll tell you, I think we're in a place that's a lot dustier than Neil's. It's a good thing we had a simulator because that was an IFR landing. Boy, am I glad I was high, Al; I couldn't, I couldn't --

Roger, Pete.

I know it. Holy cran, it's beautiful out here!

It sure is. It's something else. We flew by --

How are you?

Thank you, sir. We'll see you in 32 hours.

I'll turn this camera off, Pete. I'll check descent REG pressure, Pete.

Coming down.

Okay. It's coming slow. That was a good show --

Roger. Stay for T1.

Okay, 414 plus 2. ... 68, RECORDER, OFF. ... 4.

Hey, we flew right by the crater, Houston. But this ground looks neat out here; we're not going to have any trouble going back there.

Okay. We're in lunar align, Houston, on the AGS. Let me know when you get to 68 and I'll write down ... --

Yes.

No, sir. About halfway between site 4 and site --
CONFIDENTIAL

04 18 10 15 LMP ON.
04 18 10 16 CDR VHF ANTENNA to EVA.
04 18 10 17 LMP EVA.
04 18 10 18 CDR UPLINK SQUELCH, enable.
04 18 10 19 LMP UPLINK SQUELCH, enable.
04 18 10 20 CDR LMP connect to PLSS COMM - CB audio.
04 18 10 23 LMP Okay.
04 18 27 53 CC ... Clipper. That sounds good.
04 18 28 12 CDR Just hear --
04 18 28 13 LMP Yes.
04 18 28 14 CDR Hey, all of a sudden I get all kinds of COMM. Could you hear me?
04 18 28 18 LMP Yes.
04 18 28 20 CDR Houston, do you hear me?
04 18 28 23 CC Intrepid, we read you loud and clear.
04 18 28 26 SC Okay. *** along *** along, Houston.
04 18 28 35 CDR Hello, Houston; Intrepid. How do you read?
04 18 28 42 CC Intrepid, Houston. We read you loud and clear.
04 18 28 44 CDR Okay. Do you read Al?
04 18 28 48 CC Negative.
04 18 28 53 CDR Could be your radio.
04 18 28 54 CC Al, now we read you very weak in the background.
04 18 28 56 LMP Houston, how do you read me now?
04 18 28 58 CC Al, give us a short count.
04 18 29 07  LMP  *** 5, 4, 3, 2 ***
04 18 29 15  CC   Al, we read you partially on the last part of that count, with a loud hum in the background.
04 18 29 19  LMP  ***
04 18 29 26  CC   Loud and clear, Al.
04 18 29 27  LMP   I accidentally hit your --
04 18 29 34  CDR   (Laughter)
04 18 29 35  LMP   Let's go.
04 18 29 36  CDR   You got to be kidding.
04 18 29 37  LMP   That's right.
04 18 29 38  CDR   Wait a minute; go back to B.
04 18 29 40  LMP   Okay. We're going to complete some COMM***
04 18 29 43  CDR   Go to A.
04 18 29 45  LMP   That's what it was, Pete.
04 18 29 46  CDR   Yes. Go to A?
04 18 29 47  LMP   Loud and clear, babe. Loud and clear. Go to ***
04 18 29 54  CDR   Go to B. Go to B.
04 18 29 56  LMP   Loud and clear.
04 18 29 57  CDR   Okay. Okay; go AR.
04 18 30 02  LMP   AR. How do you hear, Pete?
04 18 30 06  CDR   Loud and clear.
04 18 30 08  LMP   How do you hear, Houston?
04 18 30 12  CC   Intrepid, we read you loud and clear; and, for your info, Clipper got a visual on you, and he also picked up Surveyor.
04 18 30 19 LMP (Laughter) Want to ask him?
04 18 30 20 CDR Hey, where are we? (laughter)
04 18 30 28 LMP Houston, my O₂ quantity is --
04 18 30 32 CDR Mine's 90, Houston.
04 18 30 34 LMP -- 90 percent.
04 18 30 36 CDR Okay. CB COMM; TV, OPEN.
04 18 30 37 LMP Okay.
04 18 30 42 CC Copy. 90 both.
04 18 30 43 CDR Okay. Did he tell you how far - did he have the LM and the Surveyor in his sextant at the same time?
04 18 30 54 LMP Go ahead. Read that to me, ... Pete.
04 18 30 57 CDR ECS CABIN REPRESS, closed.
04 18 30 58 LMP It is.
04 18 30 59 CDR SUIT FAN DELTA-P, open.
04 18 31 00 LMP Open.
04 18 31 01 CDR ECS SUIT FAN 1, open.
04 18 31 02 LMP Open, SUIT FAN 1, on your side. Okay, read me that.
04 18 31 10 CDR SUIT GAS DIVERTER, PULL/EGRESS.
04 18 31 12 LMP It's PULL/EGRESS.
04 18 31 14 CDR CABIN GAS RETURN to EGRESS.
04 18 31 15 LMP CABIN GAS RETURN, EGRESS.
04 18 31 17 CC Clipper, go ahead.
04 18 31 18 CDR SUIT CIRCUIT RELIEF, AUTO.
04 18 31 20 LMP SUIT CIRCUIT RELIEF, AUTO.
04 18 31 23  CDR  Verify ECS caution and H₂ SEP component lights come on.

04 18 31 29  LMP  I don't have anything.

04 18 31 43  CDR  SUIT GAS DIVERTER, FULL/EGRESS; CABIN GAS RETURN to EGRESS; SUIT CIRCUIT RELIEF, AUTO. I don't have an ECS light yet.

04 18 31 53  LMP  *** all this stuff will be - You know, it runs down, takes a little while.

04 18 31 56  CDR  Oh, okay. Very good. OPS connect, LMP first. Turn around - okay - , slowly. What do you want?

04 18 32 07  LMP  I thought you were going to undo it.

04 18 32 08  CDR  Oh. Well, I can't from this side.

04 18 32 10  LMP  Okay.

04 18 32 11  CDR  Be still. Right there. Boy, these PLSS's are nice in one-sixth g. There's one O₂ hose - *** five more of an O₂ hose. Houston, Intrepid.

04 18 32 37  CC  Intrepid, Houston. Go ahead.

04 18 32 39  CDR  Roger. Did Yankee Clipper have us both in his sextant at the same time? Over.

04 18 33 00  CC  Roger. That's affirmative. He got you between head crater and Surveyor crater, slightly north.

04 18 33 03  LMP  That's it.

04 18 33 09  LMP  That - that's where I figured we landed. Okay. Turn around slow.

04 18 33 10  LMP  That's all I can do, Pete, with these hoses on.

04 18 33 12  CDR  That all you can do? Okay. Let me put this down. That's funny. Oh. I didn't get something. You're going to have to turn around.

04 18 33 21  LMP  Okay.
Easy does it, babes.

Good shape.

I've got to be careful, or I'll jump right through that cabin overhead every time I want to - to do something. Wait a minute.

Okay.

Got it. Just a second, I'll be right with you. You can carry this PLSS around for 29 hours. Almost feels good.

Relatively speaking, it feels great (laughter).


Okay. Get this one on?

Yes. I - You got it?

Got that one.

Okay. Now, turn - You got to stand - Can you stand up straight?

Yes, but I can't turn any further, see; those --

Yes. Wait a minute.

Okay, now. You want this under this one flap, don't you?

Yes.

Okay. Under the flap. Snap, crackle - pop. There you go. Now, where are we? Back to the checklist.

Okay, let me get yours, now.

Wait a minute. Let's get you off --

Okay.
-- this ship's system first. ... to actuated RCU, which it is; snap OPS O₂ hose to side of PLSS, which I did. SUIT ISOLATION VALVES, SUIT DISCONNECT, on the LMP. There you go.

Okay. Connects ... to hoses.

I'll get them. Let me get them; they're easier.

Okay.

Oh, boy. Look at the water!

Where's all the water coming from?

In that suit loop.

Where's all the water coming from?

Comes right out of the inlet hose.

Sure is. Okay, do you want to connect the oxygen?

Okay. I'll. Just a second, I want to - I thought I was getting some water in my suit; it's just cold air.

Okay. That's connected and locked. Okay. What else we got?

Purge valve.

Okay, one purge valve, coming up.

Wait a minute. Get the safety locked.

Is it locked?

Yes, sir; that's locked.

It's centered in proper height. Okay.

Okay, same thing. Lean over and let me get your gear.

All right. I'm just going to squat down like this, and you can get all of it.
Okay. That's a good way to do it.

I'm going to fuel up on the drinking water.

Okay.

I got the feeling we're going to put an ALSEP package out.

Okay, stand up - Pete. Not a lot of room.

Yes.

Okay, here's one for over your head - one from under your arm. Looks good.

Looks good.

Okay.

Just a second.

Okay, let me disconnect your hose - done.

Okay.

Here comes your exhaust. ...2 and 3.

There's a lot of water in those hoses. Hey, Houston, you read Intrepid?

Intrepid, Roger. We copy your comment on water in the hoses.

It's just that the air seems to be extremely cold - coming in; at least - the inlet hose is quite cold - and some moisture's condensed down in it. Everything else seems okay.

Roger.

That's tricky; that looks like it's locked, and it isn't.

What's that?

That OPS position right there.
04 18 38 40  CDR  Okay?
04 18 38 42  LMP  That's good.
04 18 38 45  CDR  You want me to check that again?
04 18 38 47  LMP  Yes, check mine to make sure it's locked.
04 18 38 48  CDR  Yes. It's locked.
04 18 38 49  LMP  Okay.
04 18 38 54  CDR  ***crink..
04 18 38 55  LMP  Okay. Let's do that.
04 18 38 58  CDR  Pass the gun around, and we'll shut off the descent H₂O.
04 18 39 08  CDR  (Laughter)
04 18 39 30  LMP  ***the water off. The H₂O is off.
04 18 39 35  CDR  Okay, position mikes.
04 18 39 37  LMP  Do it.
04 18 39 38  CDR  Up.
04 18 39 39  LMP  S-band on?
04 18 39 40  CDR  Yes.
Okay. Mine's on. ... got a clear. Don helmets and visors. Okay. Let me get your helmet for you. Stay right where you are. Okay. Watch your head. Get your snaps; that's on pretty good. Locked. Get your - Everything is so light up here. The helmet cover is just about flipping through this. Out there in the Cape, it was a little bit tougher.

Okay. My fan is running.

Is your vent flag up? I can't tell.

It's not. Came off. Be just a second.

*** turn it off. ...

I can hear it.

Hear it spin up? Remember when we talked about that one? Maybe when I put my helmet on, it won't - Well, that water in your suit's making your helmet fog a bit.

Take my helmet off a minute.

Okay.

Put your hand over the back of my thing and see if you can feel it? No. No. Right over the back of the - the neckring.

Don't feel my own either, though.

I can feel air blowing out of yours. Can't you feel air blowing out of that?

No. Is any of it hitting your neck?
04 18 42 48 CDR  Huh?
04 18 42 49 LMP  Is it hitting your neck at all?
04 18 42 51 CDR  No. The P-flag goes out, huh?
04 18 42 58 LMP  Yes. Mine's out.
04 18 42 59 CDR  Hey, Houston. Didn't somebody tell me that these
                  P-flags might not go out until you get your helmet
                  and gloves on?
04 18 43 10 CC   Intrepid, that's affirmative. Go ahead and button
                  up; put the helmet and gloves on and turn on the
                  fan and the vent flag should go out.
04 18 43 16 CDR  That helmet's sorry. It never - it's not wiped
                  enough.
04 18 43 19 LMP  I know what it is; it's got that - all that -
                  probably blowing all this moisture out of your
                  suit. Want to wipe it again? That's better. ...
04 18 43 36 CDR  Okay. I'll tell you one thing, let's turn this
                  valve right here up a little bit. Where's the
                  helmet bags?
04 18 43 49 LMP  Here.
04 18 44 03 CDR  I've got this sneaking suspicion that fan is not
                  running like it should.
04 18 44 11 LMP  You'll have to wait until you get your gear on and
                  let's see.
04 18 44 14 CDR  I know. It happened to me once before. Somebody
                  left a piece of paper in the PLSS LiOH canister.
04 18 44 25 LMP  It would shut down if it did.
04 18 44 27 CDR  *** make me unhappy.
04 18 44 31 LMP  Okay. Let me do this. You've got to wipe yours
                  off. I didn't wipe it off good. Don't leave that
                  there. Another one of those, huh? Okay?
04 18 44 53 LMP  Turn this way and let me check that LiOH canister.
Open that thing up; pull that canister all the way out of there. Look in there, make sure there isn't something in there.

Okay.

That's exactly what happened the last time.

Nothing - clean and neat.

Put the canister back in and lock the door.

Locked.

That a boy.

Just a second. That's good and tight now.

Okay. Hey, I'm going to do this the other way around, Al. Going to get my gloves on first; helmet last.

See how it runs this trip. Try it this way this time. Pretty good, looks pretty good.

Okay.

See how it works this trip.

Okay, let's --

Hey, your vent flag went out. Looks good, Pete.

Oh, yes. Okay.

Everything's working.

Crazy. Everything looks good, Houston.

Roger, Intrepid.

Double check my helmet down will you, Al?

Okay; it's not locked.

It's locked.
Okay. Get your gloves out.

Okay. Wait a minute.

... yours. *** this out for you. It's right over here; right by yours. It's right there.

Wait a minute. Do you want to get your EV gloves out of the way? You want to leave them right where they are?

No. Mine's good - good enough right where they are.

Look, can you see, the window's beginning to fog up. You want to put the window heaters on?

No. We can't watch them.

Better put them on, for a while; pull them before you get out.

Okay, that's what I'll do. Never get any pictures that way.

Hey, Houston?

Which one's yours?

That's yours. Put it on your head.

But I want to - Okay. Mine's back there. Just a second, I'll get it.

What do you need?

I was going to get you a turn on that LMP - -

Clipper, understand. You want to know which camera to be using on the next pass. Is that AFFIRM?

- - a picture of the lunar surface.

Copy. Stand by.

Just a second. Let me look - let me look at this, Pete. I'm going to really check that.
CC 04 18 48 21 Dick, let's go with the color interior.

LMP 04 18 48 24 Okay. Look real sharp here.

CC 04 18 48 32 Dick, go with the color exterior for the next pass. Color exterior.

CDR 04 18 48 46 Okay. Now. Let me slip my PLSS up. Stuff flies out under the --

LMP 04 18 48 50 -- the RCU. Will do, Pete, will do.

CDR 04 18 48 53 And I'll get you all buttoned up.

LMP 04 18 48 56 Looks fine. Let me pull your visor down a little bit so you can --

CDR 04 18 48 58 Yes, that a boy.

LMP 04 18 49 00 Good, and then you got these --

CDR 04 18 49 01 Okay. Let's leave my gloves off until I get your helmet and visor on.

LMP 04 18 49 04 All right.

CDR 04 18 49 06 Your helmet. Hand me that, and I'll hold it for you. There you go. Let me slide that on your head.

LMP 04 18 49 30 I'll hold it up if you'll lock --

CDR 04 18 49 34 No, no. No. Wait a minute. Locked.

LMP 04 18 49 38 Looks good. Everything looks --

CDR 04 18 49 42 Hold this - hold your thing just a second. Okay. Wait a minute. *** I checked that for you.

LMP 04 18 50 05 Okay.

CDR 04 18 50 10 Okay. There you go.

LMP 04 18 50 11 Okay.

CDR 04 18 50 13 Pull up your PLSS here. Pull up your PLSS, and wait a minute, let me get all this out first. Out and about. There you go.
Okay. Okay. What does it say next?

Now, we need a set of gloves.

Okay.

Now let me just turn real slow.

Yankee Clipper, Houston. One minute to LOS. And we'll be giving you a P22 PAD at AOS. Yankee Clipper, Houston 30 seconds to LOS.

Boy, you can tell those are brand new gloves. I can hardly get my fingers down them. Before you cover your wrist, let me check your locks and you check mine.

Okay, just a second.

Okay.

How does that look to you, Pete? These are locked.

Just a minute.

Let me see if - that looks good. *** look at you. Good enough.

Okay.

Okay, babe. Here, let me see that. Okay, it's on there. Okay.

Okay, now. Hold the phone. Let's see.

Give you a shot of cold water here.

Yes. *** some helmet bags in the SRC area. They are already there.

Okay.

*** a shot of cold water, and then we'll turn off the pump.

Okay. Here it comes. *** chill down.

*** chill down.
04 18 54 06  LMP  Yes, leave it on for a second.
04 18 54 19  CDR  That it?
04 18 54 20  LMP  That's it.
04 18 54 21  CDR  Okay.  CB(16):  ECS/LCG PUMP, open.
04 18 54 27  LMP  ***
04 18 54 29  CDR  PLSS to DISCONNECT.  Let me disconnect yours.
04 18 54 33  LMP  Okay.
04 18 54 39  CDR  You have to turn this way.  ***
04 18 54 43  LMP  That it?
04 18 54 44  CDR  Okay.
04 18 54 45  LMP  Just a second.  Let me get yours.  Okay.  Just let -
                  hold that a second.
04 18 54 58  CDR  Yes, now I got to hook up yours.
04 18 55 02  LMP  *** right over the top.
04 18 55 13  LMP  It's in.
04 18 55 14  CDR  In?
04 18 55 15  LMP  In, babe.
04 18 55 17  CDR  Okay.  Thank you.  Hang on to your water hose, here.
                  No, your right hand, that a boy.  Okay?
04 18 55 35  LMP  *** rotate ***.
04 18 55 40  CDR  *** in.  Locks go in?
04 18 55 41  LMP  Yes, sir.
04 18 55 43  CDR  Okay.  Both locks are in.
04 18 55 46  LMP  *** stow these hoses.
04 18 55 50  CDR  Okay.
Try to route yours up there on the wall.
Yes. Yes.
While you're doing that, I'll get this in.
I'm afraid I can't do it with you standing there. I'm going to have to wait until you turn around.
Okay.
Put yours in there.
Okay.
Okay. I'll turn around and get out of your way.
Back off into your corner.
Okay.
*** get up on the step, a little bit.
...
*** hold these hoses.
Sure. *** step?
Turn around.
Okay.
I wonder if I need to get the water in there? Maybe you could do that.
Okay.
Every *** else is in.
Will do.
Wait a second. Got it.
Okay.
Got the window heater on over there, Pete?
No. I'll have to wait until you turn around.

Let's - How you doing over there?

Good. Just about got it done.

Okay. I'll turn on your window heater in just a second.

All right. That's it.

You get in your corner again.

Okay.

I don't know about you, but my suit is collapsing around me. How about you?

That's right.

Huh?

Yes, so's mine. Cabin pressure must have pumped a little.

It's the last breaker in the upper left. Okay, now, verify. Don EV gloves - Wait a minute -

*** here.

Torso tie-down?

Mine's okay.

All O2 connectors locked?

*** mine. I'll check yours. I'll check yours again. Locked; that one's locked. That's locked. They're vertical. Are my diverter valves vertical?

Let's see. Your diverter valves are vertical. Everything looks locked, here? ***

Make sure the water lock is in. Is the water lock in?

You don't have a lock on your water control.
- - ... little pins go in.
No, it's - it's locked.
Hey, here's one that doesn't have a lock locked.
That's locked.
Okay. Mine is giving a squeak.
What am I hung under?
I think we ought to get over here where we turn on the oxygen.
That's right. Got a warning tone for a PRESS or something.
Yes. We ... ...
We need PRESS O₂ ON. *** what it says?
Yes. No; wait a minute. Excuse me. PLSS DIVERTER, MIN. Okay.
Okay.
PLSS pump, on.
Just wait. Let me read that thing.
*** Let's get the oxygen on.
Okay.
Wait a minute. Get your pump on.
There we go. DIVERTER, MIN; PRESS REG's A and B, EGRESS.
Okay.
Try that for size. Okay. They're EGRESS.
04 19 01 25 CDR  Okay.  *** PLSS O₂, ON.
04 19 01 29 LMP  Okay.  Verify - Okay, that's a good idea.
04 19 01 39 LMP  There we go.
04 19 01 45 CDR  I've got an O-flag, a tone on, and - -
04 19 01 48 LMP  Okay.  Check your CB configuration while we wait.
04 19 01 57 CDR  I don't think we can both turn around at the same time.
04 19 02 00 LMP  Okay.  Go ahead and check yours, and I'll check mine.
04 19 02 13 CDR  How's your window doing?
04 19 02 16 LMP  It's clearing up.
04 19 02 25 CDR  Oh, boy!  That suit was really clapped down around me.
04 19 02 28 LMP  Yes.
04 19 02 47 CDR  Yes.  CB's look pretty good.
04 19 02 49 LMP  Okay.  Let me check mine.
04 19 02 56 CDR  And I'm sitting at 3.8.  Okay.
04 19 03 13 LMP  Okay.  Looking good.  Turn my suit PRESS up.  Coming on up.  Do I need ...K check now?
04 19 03 35 CDR  Yes.
04 19 03 36 LMP  Okay.  Feels good in this one-sixth g, doesn't it?
04 19 03 43 CDR  Yes, except I noticed with the slight slope we're standing on, I keep falling in the back.
04 19 03 47 LMP  Yes.
04 19 03 50 CDR  I think I left my oxygen off.  Coming up.
04 19 04 13 LMP  Those rocks have been waiting 4-1/2 billion years for us to come grab them.

CONFIDENTIAL
Think so, huh?
Let's go grab a few (laughter). Yes. Heck, yes.
Get an ALSEP out first.
Okay.
*** the old check. Okay. Mine's holding real good.
Got a good tight suit?
Yes. And the tone came on, so I'm ready to have the oxygen off. I've got a good tight suit.
Okay. .... --
Here we go. Houston, are we GO for EVA?
Stand by, Intrepid. We'll be right with you.
Okay.
Stand by? You guys ought to be spring-loaded.
Intrepid, you're GO for EVA.
... --
Roger. CABIN REPRESS valve, closed?
Okay. Just a second.
Easy does it.
CABIN REPRESS, close.
Okay. DUMP valve open, then AUTO at 3-1/2.
Okay. Easy does it.
Want me to help you?
***
What do you need?
04 19 06 04 LMP  Just need to move a little bit.
04 19 06 06 CDR  Okay.
04 19 06 15 LMP  Kind of give me a push back, Pete.
04 19 06 21 CDR  Why don't you let me get it, Al? Stand up. Stand up, Al.
04 19 06 26 LMP  I - I got it.
04 19 06 28 CDR  The ... in the way again.
04 19 06 29 LMP  Yes.
04 19 06 47 CDR  MARK.
04 19 06 48 CDR  3.5. Okay. Let me see.
04 19 06 54 CC   Copy 3.5.
04 19 06 55 CDR  Verify cuff gage does not drop below 4.8.
04 19 07 00 LMP  Sure doesn't.
04 19 07 01 CDR  Man, mine's up in the overhead someplace. You got a foggy visor?
04 19 07 12 LMP  No.
04 19 07 14 CDR  No? Verify cabin at 3-1/2, suit circuits at 3-1/2 to 4.5, and it's up there at 4.2.
04 19 07 29 LMP  Okay.
04 19 07 33 CDR  PGA is greater than 4.8 and it's decaying.
04 19 07 35 LMP  Go.
04 19 07 37 CDR  Okay, Houston, we're GO to open it all the way here. How about you?
04 19 07 41 LMP  They said GO.
Okay, FORWARD DUMP valve, open.

That's it, Pete.

Roger, Intrepid. Looks good here.

Feels good. ...

When do we turn on the water --

Just as soon as we get this thing down real low.

We got a tone.

That's right.

And an H2O flag.

That's good. Both suits.

I show 1 pound on the cabin.
<table>
<thead>
<tr>
<th>Time</th>
<th>Actor</th>
<th>Action/Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 19 08 22</td>
<td>LMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>04 19 08 56</td>
<td>LMP</td>
<td>How's it look?</td>
</tr>
<tr>
<td>04 19 08 57</td>
<td>CDR</td>
<td>Oh, it's about 0.2.</td>
</tr>
<tr>
<td>04 19 09 00</td>
<td>LMP</td>
<td>Let's give it a go.</td>
</tr>
<tr>
<td>04 19 09 01</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>04 19 09 10</td>
<td>LMP</td>
<td>Not quite.</td>
</tr>
<tr>
<td>04 19 09 12</td>
<td>CDR</td>
<td>Just let it sit for a while.</td>
</tr>
<tr>
<td>04 19 09 11</td>
<td>LMP</td>
<td>Yes.</td>
</tr>
<tr>
<td>04 19 09 35</td>
<td>CDR</td>
<td>On about a 0.1 now.</td>
</tr>
<tr>
<td>04 19 09 44</td>
<td>LMP</td>
<td>Okay. Give me a little push down.</td>
</tr>
<tr>
<td>04 19 09 46</td>
<td>CDR</td>
<td>Down?</td>
</tr>
<tr>
<td>04 19 10 09</td>
<td>CDR</td>
<td>How are you doing?</td>
</tr>
<tr>
<td>04 19 10 10</td>
<td>LMP</td>
<td>Oh, I'm doing great; just waiting for the pressure to get low enough to open the hatch.</td>
</tr>
<tr>
<td>04 19 10 14</td>
<td>CDR</td>
<td>You can reach that upper left-hand corner; you can feel it.</td>
</tr>
<tr>
<td>04 19 10 24</td>
<td>LMP</td>
<td>Easy, easy does it.</td>
</tr>
<tr>
<td>04 19 10 30</td>
<td>CDR</td>
<td>There you go.</td>
</tr>
<tr>
<td>04 19 10 31</td>
<td>LMP</td>
<td>Got it, babe.</td>
</tr>
<tr>
<td>04 19 10 33</td>
<td>CDR</td>
<td>Okay. The hatch is open now.</td>
</tr>
<tr>
<td>04 19 10 36</td>
<td>LMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>04 19 10 38</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>04 19 10 39</td>
<td>LMP</td>
<td>Whoops. Wait a minute. I'll hold it. Pull her open again.</td>
</tr>
<tr>
<td>04 19 10 47</td>
<td>CDR</td>
<td>There. You got it?</td>
</tr>
</tbody>
</table>
Okay. I got the hatch. Go ahead and reset the valve.

Okay. Now, what I need to do is get some water going after you stand up. Okay?

Good shape.

All right. Lean it against me.

Okay. Feedwater, open. Okay. Let's get it going.

Mine's on.

Mine's on, too.

Okay.

...

All right, while we're doing that, rest until cooling sufficient; verify PGA stable at 3.7. Mine's still up there at some horrendous number. 4.8 --

Get these.

No wonder I can't move. ... down. LM suit circuit 3.6 to 4.0.

It is 4.1.

Good. ***4.3. CWEA status. You should have an ASCENT PRESS light, a preamps, and an ECS.

Exactly what we've got.

And H₂O SEP COMPONENT LIGHT, ON.

Okay.

LIGHTING ANUNCIATOR/NUMERICS, DIM.

Okay.

CB(16): TV, close.
04 19 12 02 LMP All right.
04 19 12 03 CDR Do that.
04 19 12 04 LMP I'm going to turn around.
04 19 12 05 CDR Okay.
04 19 12 19 LMP Closed.
04 19 12 21 CDR Now, if you'll just hold still a minute - No, you're going to have to turn around and get in the corner.
04 19 12 27 LMP Okay.
04 19 12 28 CDR And bend over and I'll get your antenna up.
04 19 12 29 LMP All right.
04 19 12 31 CDR Easy. Easy does it.
04 19 12 33 CDR Okay. Bend over.
04 19 12 34 LMP Okay.
04 19 12 35 CDR ...
04 19 12 50 CDR One antenna up.
04 19 12 51 LMP Okay.
04 19 13 10 LMP Yours is up.
04 19 13 11 CDR Okay. ... cool.
04 19 13 25 LMP Why don't you put those LIGHTING ANUNCIATORS to DIM?
04 19 13 28 CDR Okay. If you'll back into your corner so I can turn around.
04 19 13 31 LMP All right.
04 19 13 44 LMP Okay.
04 19 13 52  CDR  I'm finding it the other way around. In the airplane, I walk flatfooted. Here, I'm standing on my toes all the time.

04 19 14 07  CDR  A pretty good vacuum. Wonder how long it's going to take this boiler to get going.

04 19 14 24  LMP  New visor.

04 19 14 27  CDR  No. Same as yours.

04 19 14 30  LMP  Some of this cool air in here and it'll be okay.

04 19 14 37  CDR  There goes the hatch.

04 19 14 38  LMP  Oh, oh. Let's get that baby. Get it. Okay. I'll hold it open. Yes, because that water —

04 19 14 47  CDR  Yes, I know.

04 19 14 48  LMP  That'll tend to keep it closed. Yes, let's pull it all the way open while waiting for ...

04 19 14 52  CDR  There. That a boy.

04 19 15 26  CDR  Hey, my boiler's on the line.

04 19 15 28  LMP  Yes. Mine's coming up, too. Feels real good.

04 19 15 31  CDR  Let's see. I can go to intermediate flow, huh?

04 19 15 37  LMP  Yes. Soon as she starts.

04 19 15 41  CDR  ***, it's in INTERMEDIATE. I'm ready to go over the sill.

04 19 15 44  LMP  Just a second.

04 19 15 45  CDR  Open my checklist.

04 19 15 46  LMP  ***find the LEC; hey, come on, babe.

04 19 15 50  CDR  Deploy the LEC and the MESA; mobility; cg*** downreach, arm motion, walking balance, and all that good stuff.
04 19 15 59  LMP  All right. Just a second, pull the door all the way back. ***hand you something? ***you go out, and then I'll hand it to you. Yes. By-by; see you in a minute.

04 19 16 15  CDR  How am I doing? Am I hanging on something here? I get the feeling I'm stuck under something here.

04 19 16 20  LMP  You're bumping into the - the purse there. ***forward.


04 19 16 28  LMP  All right, now you're in good shape.

04 19 16 29  CDR  Okay.

04 19 16 30  LMP  Go straight down from where you are.

04 19 16 31  CDR  Okay.

04 19 16 34  LMP  Good; that's good.

04 19 16 36  CDR  Okay.

04 19 16 37  LMP  Doing good. You're headed right square out the hatch. You'll have to bend over more, though. Wait - wait - wait - oops. Come forward a little. Go to your right - here - There you are. Now go. Get that little --

04 19 16 57  LMP  You got to kneel down a little more.

04 19 17 01  LMP  Well, I'll push you if you don't mind.

04 19 17 08  CDR  What am I hung on?

04 19 17 10  LMP  ***You're okay.

04 19 17 12  CDR  Got this garbage bag in my way.

04 19 17 15  LMP  Okay. You're headed out the door. Looks real good.

04 19 17 37  CDR  Okay. Okay, I'm out on the porch. Just a second, gang, let me pull the pip pin. Deploy the MESA.
<table>
<thead>
<tr>
<th>Time</th>
<th>Participant</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 19 17 56</td>
<td>LMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>04 19 17 57</td>
<td>CDR</td>
<td>And I'm going to give a heck of a tug on that handle. Down another step.</td>
</tr>
<tr>
<td>04 19 18 01</td>
<td>LMP</td>
<td>Okay. While you're doing that, let me get the LEC ready for you.</td>
</tr>
<tr>
<td>04 19 18 08</td>
<td>CDR</td>
<td>Good Godfrey. That - that handle's in there like something I never saw before.</td>
</tr>
<tr>
<td>04 19 18 16</td>
<td>LMP</td>
<td>How's the lock joint? Is it easy to get - Was it easy to get the lock out?</td>
</tr>
<tr>
<td>04 19 18 19</td>
<td>CDR</td>
<td>Yes. Now that's better. I couldn't even get the handle out of the deal. I just pulled the table releases down.</td>
</tr>
<tr>
<td>04 19 18 26</td>
<td>LMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>04 19 18 27</td>
<td>CDR</td>
<td>There you go.</td>
</tr>
<tr>
<td>04 19 18 32</td>
<td>LMP</td>
<td>You haven't got anything to do, so you can take this with you.</td>
</tr>
<tr>
<td>04 19 18 35</td>
<td>CDR</td>
<td>Hey, I'll tell you what we're parked next to.</td>
</tr>
<tr>
<td>04 19 18 37</td>
<td>LMP</td>
<td>What?</td>
</tr>
<tr>
<td>04 19 18 38</td>
<td>CDR</td>
<td>We're about 25 feet in front of the Surveyor crater.</td>
</tr>
<tr>
<td>04 19 18 41</td>
<td>LMP</td>
<td>That's good. That's where we wanted to be.</td>
</tr>
<tr>
<td>04 19 18 43</td>
<td>CDR</td>
<td>I got - I bet you when I get down to the bottom of the ladder, I can see the Surveyor.</td>
</tr>
<tr>
<td>04 19 18 49</td>
<td>LMP</td>
<td>Roger. Here you are. You want to take this with you, Pete?</td>
</tr>
<tr>
<td>04 19 18 51</td>
<td>CDR</td>
<td>Just swing her out here.</td>
</tr>
<tr>
<td>04 19 18 54</td>
<td>CC</td>
<td>Sounds good, Pete. Just like you wanted.</td>
</tr>
<tr>
<td>04 19 18 55</td>
<td>CDR</td>
<td>That's right.</td>
</tr>
<tr>
<td>04 19 19 00</td>
<td>LMP</td>
<td>Okay; now hold it there just a second, Pete.</td>
</tr>
</tbody>
</table>
04 19 19 02 CDR Okay.
04 19 19 04 LMP One second.
04 19 19 09 CDR Do you have any TV, Houston?
04 19 19 16 CC Roger. We've got a TV.
04 19 19 17 CDR How's the color?
04 19 19 18 CC No Pete Conrad as yet.
04 19 19 22 CDR I'm at the top of the ladder. Okay. Now look, this thing is all the way out of the package. How do you want me to do it? This way?
04 19 19 29 LMP Just keep going.
04 19 19 30 CDR Huh?
04 19 19 31 LMP Adi5s.
04 19 19 32 CDR No, but this thing isn't all the way out of the — ... Here, let me have this end of it. Let me come back up the ladder a notch.
04 19 19 41 LMP Okay.
04 19 19 43 CDR That a boy. Which end is that? ***do I want? This is the end I want.
04 19 19 48 LMP There you go.
04 19 19 50 CDR There we go (laughter). Look at that stuff go.
04 19 19 54 LMP Sure glides at one-sixth, doesn't it?
04 19 19 56 CDR Yes. *** Looks - looks like we got 900 feet of this stuff.
04 19 20 05 LMP Hey - Okay, just a second. Don't go down yet. I've got to get my camera on you, babe.
04 19 20 09 CDR I can't go down yet, anyhow. I got to — whoops — get the LEC all the way down.
04 19 20 14 LMP Okay.
04 19 20 15  CDR  There you go.
04 19 20 34  CDR  All right. Sure can't figure out what kind of a snarl I've got here.
04 19 20 53  CDR  Hey, Al.
04 19 20 54  LMP  Yes.
04 19 20 55  CDR  Can you look - can you look out your window?
04 19 20 57  LMP  Sure.
04 19 21 00  CDR  All right. I think I see what's wrong.
04 19 21 05  LMP  What's the problem?
04 19 21 06  CDR  Oh, that LEC came out of the bag in three pieces, and, as you would well imagine, I picked the wrong piece.
04 19 21 13  LMP  Do you want me to pull it back in and throw you the end?
04 19 21 15  CDR  No. That's not the problem.
04 19 21 17  LMP  Okay. It's no trouble.
04 19 21 18  CDR  I got it right now. Man, they aren't kidding when they say things get dusty. Whew! I'm headed down the ladder.
04 19 21 24  LMP  Okay, wait. Let me get the old camera on you, babe.
04 19 21 27  CDR  Okay.
04 19 21 49  CDR  Man, is that a pretty-looking sight, that LM.
04 19 22 00  CC  You're coming into the picture now, Pete.
04 19 22 01  CDR  Okay.
04 19 22 04  LMP  Okay; got the old camera running.
04 19 22 07  CDR  Okay. Down to the - the pad.
04 19 22 13  LMP  Okay.
04 19 22 14 CDR  Whoopie! Man, that may have been a small one for Neil, but that's a long one for me. I'm going to step off the pad.

04 19 22 22 CDR  MARK.

04 19 22 23 CDR  Off the - ooo, is that soft and queasy. Hey, that's neat. I don't sink in too far. I'll try a little - Boy, that Sun's bright. That's just like somebody - shining a spotlight on your hand.

04 19 23 10 CDR  Well, I can walk pretty well, Al, but I've got to take it easy and watch what I'm doing. Boy, you'll never believe it. Guess what I see sitting on the side of the crater.

04 19 23 25 LMP  The old Surveyor, huh?

04 19 23 26 CDR  The old Surveyor; yes, sir (laughter). Does that look neat! It can't be any further than 600 feet from here. How about that?

04 19 23 42 CDR  Okay. Let me see. I've got a little chore to do here, right?

04 19 23 45 CC  Well planned, Pete.

04 19 23 47 CDR  Say again.

04 19 23 52 CC  I say that was well planned, Pete.

04 19 23 53 CDR  Yes. Just a couple of months with a lot of people. Let's see, deploy the LEC and the MESA - That's done. I'm looking at my mobility, cg shift. I have the decided impression I don't want to move too rapidly, but I can walk quite well. That cra - The Surveyor really is sitting on the side of a steep slope, I'll tell you that. Okay. Now, I'll work on my contingency sample. Got to walk real careful, Al.

04 19 24 34 LMP  Okay.

04 19 24 35 CDR  Can you see me all right?

04 19 24 36 LMP  Not yet. I need you ... back of the window for
Okay.

---

As you might suspect from some of the pictures Neil brought back, gang, I have a - several small rocks sitting out in front of me that have a neat amount of dirt built up around them. I'm not sure that my descent engine didn't blow them there. But then again, it may not have. I have the contingency sample - -

Well, let me - I'm going over to get my contingency sample, and I'll get one of the rocks - in the sample. And yes, as a matter of fact, it is built up on the side that - that the LM landed on. Let me get it. Well, there's one scoop. There's another with some more rocks in it. Whee! This dirt's just like the one-sixth g airplane, Al. Flies up in the air, and you can just chase it around. Boy, now, I'll tell you - you know, this Sun, it - it really is - it's just somebody's got a - a superbright spotlight. Here's another good looking rock. Whoops! In the sample. There's another rock I want to get in it.

I think that's about enough, don't you? Except there's one - one big rock that's too pretty to pass up. No, I ... not be a hog. It won't fit. I'll go over here and get this other one, though.

Boy, you sure lean forward, Pete.

***I lean forward; I feel like I'm going to fall over in any direction.

You're leaning about - -

Say, Houston, one of the first things that I can see, by golly, is little glass beads. I got a piece about a quarter of an inch in sight, and
CONFIDENTIAL

I'm going to put it in the contingency sample bag, if I can get it. I got it. Am I really leaning over, Al?

04 19 27 48 LMP You sure are. You - On Earth, you'd fall over, I believe.

04 19 27 52 CDR Huh?

04 19 27 53 LMP On Earth, you'd fall over leaning that far forward.

04 19 27 57 CDR But - it seems a little weird, I'll tell you. It's - Don't think you're going to steam around here quite as fast as you thought you were.

04 19 28 04 LMP ***tell you, your boots are digging in the soil quite a bit. If you don't pick up your feet, you really kick a - a load of dirt ahead of you. Your left foot's got a big mound ahead of it right now that it's just pushing along.

04 19 28 18 CDR Uh-oh, do I hear a tone?

04 19 28 21 LMP Yes. I've got an H_2O A.

04 19 28 25 CDR You do?

04 19 28 27 LMP Yes. I wonder why? Hey, Houston.

04 19 28 36 CC Al, verify feedwater's on.

04 19 28 37 CDR Ish.

04 19 28 38 LMP It's been on. It's still on.

04 19 28 41 CDR Boy, do I sink in. Wow!

04 19 28 43 LMP Feedwater's on and it's still real cool in here.

04 19 29 06 CC Al, DIVERTER VALVE to MINIMUM.

04 19 29 07 LMP Okay. It's MINIMUM now. What do you think I may have done? Broken through the sublimator or something?

04 19 29 20 CC That's affirmative, Al.
04 19 29 33 CC  We have a good shot of you there, Pete.
04 19 29 34 CDR  Okay. Well, I'm starting to - take this baby apart. While I am doing that - Houston.
04 19 29 51 CDR  That descent engine! It's just like Neil's.
04 19 29 54 CC  Go ahead.
04 19 29 55 CDR  I didn't dig any crater at all. Al, you've really got to watch your step down here.
04 19 30 06 LMP  Okay.
04 19 30 18 CDR  Look at all those good things in this MESA. Things that I've seen before. Didn't hardly stroke the gear at all, and it looked like we were - looks like I landed just about vertical.
04 19 30 44 CDR  Just like Neil and Buzz said, Al. You get on a little slope and you tend to keep on going.
04 19 31 18 LMP  ... fell over.
04 19 31 28 CDR  Would you believe it - the MESA is too low for once?
04 19 31 39 CC  Al, how does the feedwater look now?
04 19 31 45 LMP  Well, it's still got an A in there, but I'm plenty cool; I went back to MINIMUM, and I'm sitting here in MINIMUM. What do you think happened?
04 19 32 04 CC  Al, we would like to watch it a little bit. It could be instrumentation. Stand by.
04 19 32 06 LMP  Okay.
04 19 32 37 CDR  (Humming) How long have I been out, Houston?
04 19 32 47 CC  Pete, you've been out 25 minutes, and you're about 4 minutes ahead.
04 19 32 50 CDR  Okay. I got the table out, ... the MESA, and I'm setting up ETB at this time. Let's see. How is this packed? Very nice. Very nice.
Hey, Al, ... work out here all day. Just take your time.

Almost too cold on INTERMEDIATE. I'm thinking seriously of going to M.

There's some - color charts.

(Dum de dum dum dum, de de dum dum dum) ***tray is right side out.

All right. No, that's not right. ***I think our next big surprise, Al, is getting this thing up.

Getting what up?

The ETB.

Oh, is that right?

(Laughter) We'll see what happens. Okay? How's your water?

Oh, it still shows an A, but it's cool. It may be instrumentation.

Let's hope so. Just beginning to warm up to this task.

LGC water pump sounds like a diesel truck running out here. Comforting to know that it's running. I'm off to get the battery.

Okay. I think I know what happened, Houston. I think I know what happened.

Ahhh!

Pete, go ahead.

What did - what did you just do, Al?

Man, I just figured it out.

You sure did. You just blew water out the front of the cabin.
ICE CRYSTALS

That's what -

Ice crystals.

-- that's what had happened to the PLSS.

What's that?

Oh, the door had swung shut, like it did before; and it probably bothered the sublimator, because it wasn't in a good vacuum anymore.

Yes.

So, I opened the door, and it's probably going to start working in a minute.

(Laughter) I should hope so. When you opened the door, that thing shot iceballs (laughter) straight out the hatch.

Yes. And there's probably -- all from my -- never thought you'd have to do that. Hey, you bent the outside of that front hatch on the way out. You tore some of the skin.

How did I do that?

I don't know; must have hit your PLSS there. Got a nice scrape mark right along the way out.

Sorry about that. ...got to be gentle.

Houston --

Al, it's looking better.

Yes, I -- I didn't realize that the hatch could close quite so tightly like that. It was just -- when I was working on the other side of the cabin, the hatch went closed and I didn't notice it, and apparently the -- it quit holding a good vacuum in here. My H₂O A flag is OFF now, so everything is copacetic.

Roger, Al. It looks good down here.
Okay.

Okay. I've got both canisters, Al, both batteries. As soon as I get them in here, I got to pack the contingency sample.

Okay. Sitting tight; waiting for you, babe.

Okay, I just - I tell you, you really can't move as fast as I thought you could. You got to take it real easy. It's a feeling that I'm most spiffy on the balance up here. Help. I may have to -

Okay. Man, did I get dirt all over myself. This is what is known as dirt's dirt.

Let me know when you start heading back out there to duty, Pete - Pete - Pete. I'll get a good shot of you, babe.

Getting ready to do it in just a second, Al, just as soon as I get the bag. I got the contingency sample in the bag.

Okay.

Just as - I've got everything else, bus batteries, LiOH canisters, and I just got to hook up the LEC. (Dum do do do, do do do) I tell you one thing, we're going to be a couple of dirty boogers. ... ... ...? Why don't you take up a little slack, Al?

All right. Just a little. It works. Hey, this is - - What?

I tell you, this is dirt, dirt.

(Laughter) That's the greatest.

What's that?

My end of the ETB just came out of its metal slot. Somebody that made this can didn't make it like all the training units; they made it littler, so it came out. I caught it as it was...
going by. You know this metal pin keeps it from sliding all the way through?

04 19 40 09  LMP  Yes.

04 19 40 10  CDR  Unfortunately, it's smaller than the metal holder. Kind of interesting.

04 19 40 16  CDR  Wait, wait, wait, wait, wait, wait.

04 19 40 17  LMP  Okay.

04 19 40 21  CDR  And ... ..., come on. That a boy. Wait just a minute. Okay, now.

04 19 40 28  LMP  Hold the phone a second.

04 19 40 32  CDR  You can - wait, wait. Here I go. De de de do do (laughter). Wait until I get in this shadow, because I can't see what I'm doing more than right here in the front --

04 19 40 44  LMP  Okay.

04 19 40 45  CDR  -- and I'm about to fall down this little crater hole. Oops. Wait, it really does get --

04 19 40 51  LMP  You'd better get over here in the shadow.

04 19 40 54  CDR  I'm down in a - Oops, another crater hole (laughter).

04 19 40 59  LMP  It's a regular obstacle course over there.

04 19 41 00  CDR  Man, am I going to get dirty. Hold it, now. Back up a little ways. ... Tell me if it's clear of the porch rail, huh?

04 19 41 18  LMP  It is now.

04 19 41 19  CDR  It is? I can't see a thing, looking into the Sun. Pull.

04 19 41 23  LMP  Okay, I'll bring her in.

04 19 41 27  CDR  ***it in easy.

04 19 41 29  LMP  Okay. Good rig.
I can't. Wait a minute. Wait, wait, wait, wait. That's a boy; now, I can see. Oh, ... (laughter). I'm getting dirty. Wheel! Got it.

Okay. I'll just step right back out to you in a flash.

Okay, let me see. While you're doing that, what was I supposed to do? Oh, I know, possible TV deploy. I'll go work on the - yes - tripod.

Okay.

Dum dum, tunk-e tunk-e tum. Trying to learn to move faster. Pretty good. Hey, I feel great. How long we been out, Houston?

Pete, you're 34 minutes into the EVA, and you're right on the nominal time line.

That contingency sample is black.

You'd better believe it.

I may have put - filled the bag too full.

***go into one of these.

One camera, two cameras. Come on, little fellow. Here comes one TV camera.

Okay, ready for you, Pete.

Right. Well - Shoot - All right. I got to stop what I'm doing. Let me come over here and get it. Here I come.

Okay.

De-dum dum dum. I feel like Bugs Bunny (laughter).

Take it away whenever you need it.

Okay. I'm going right now, if I don't fall over, I can -

Sure goes out easy.
*** Let her keep coming. Let me get over to this side. Let's get it over the handrail. Hold it, hold it right there.

Okay.

Now, I can't see it on account of the Sun, so tell me when it's over the handrail.

It's over the handrail now.

All right. Just lower it real slow. That's a boy. Easy. Hold it right there.

Okay.

Just stay put. Okay, let her go.

That's it.

All right. Now, just hold it right there. Hold it; hold it; hold it. One — that is — two. Okay, let go. All the way.

Okay.

All right, LEC, possible TV deploy, LMP egress, contingency sample area. Deploy color chart and place 70 millimeter on the MESA. So I get me a camera.

Okay, be out in a minute. Got to set the camera, and I'll be right out.

All right. Let me know so I can photograph you.

Okay.

Okay, contingency sample 8, that's 8. Eight, five.

We sampled in quite a few places, Houston, so I'm taking a bunch of pictures. Four —

Roger. Pete.
04 19 47 03  CDR  -- five pictures.
04 19 47 04  CC  Pete, for your information for those photos, your shadow lines right now is about 45 feet on a level plane.
04 19 47 14  CDR  Okay, very good. Contingency sample area I got; deploy the color chart (laughter). Take your time, Al.
04 19 47 26  LMP  Okay. I'm ready to do it.
04 19 47 53  LMP  Houston. How does the LM look? I'm getting ready to move out the front door.
04 19 48 01  CC  Roger. I'll stand by on that.
04 19 48 34  CDR  Dum de dum dum. Whoops. Hey, wait, I'm going to - I wonder if I can get in the bottom of this crater hole.
04 19 48 44  CC  Al, Houston. The LM is looking good. You're GO for egress.
04 19 48 48  LMP  Okay.
04 19 48 49  CC  Pete, you're at 40 minutes into the time line, and you're about 4 minutes ahead.
04 19 48 53  CDR  Okay. ... (laughter) Oh dear.
04 19 49 08  LMP  Okay, Pete, here I come.
04 19 49 09  CDR  Wait, wait, wait, wait.
04 19 49 11  LMP  You ready now?
04 19 49 12  CDR  No, no, no, no. Let me come - dum de dum dum dum. Got to run through this crater. Here I come. Now, wait a minute, LM egress 5:6 - *** to a shambles ... that color chart. I tried to throw it in the ground; and, naturally, it went in sideways, and it's got itself so covered with dirt, you wouldn't know what color it was. Okay, I'm ready for you.
04 19 49 41  LMP  Okay, you might want to give me directions, too.
04 19 49 43 CDR  All right, yes.
04 19 49 46 LMP  Bumping anything?
04 19 49 50 CDR  Okay, you're coming straight out and the further you can bend over, the better. All right, move to your right.
04 19 49 57 LMP  Okay.
04 19 49 58 CDR  That a boy. Now. That's it. You have to get your knees down. That a boy. Good shape, good shape.
04 19 50 10 LMP  Okay, I'll pull the hatch closed here.
04 19 50 13 CDR  Okay. Don't lock it. Okay, you're right at the edge of the porch.
04 19 50 20 LMP  Okay.
04 19 50 34 CDR  Hey, and if I'd landed 20 feet behind where I landed, we'd have landed right smack in that crater.
04 19 50 47 CDR  ***
04 19 50 49 LMP  Oh, it's kind of hard to move the door. I was just getting in and trying to get it.
04 19 50 55 CDR  There you go.
04 19 50 57 LMP  I'm going to try to keep the door open for us there.
04 19 51 01 CDR  Okay.
04 19 51 10 LMP  Pretty good, I'd better get my visor down though.
04 19 51 13 CDR  Yes, sir. My, that Sun is bright.
04 19 51 25 LMP  Well, the LM looks nice on the outside.
Houston, let me ask you a question. How important is that color chart? I tried to spike it in the ground, you know, so it was perpendicular to the Sun, and it just didn't do that, and it's all covered with dirt. I can go back and resalvage it, if you want to take the time. Okay, you're on the last step there.

Press on with what you're doing there, Pete, and we'll get a answer back to you.

Okay. Okay. Turn around and give me a big smile.

Pete, press on. No problem.

Okay. That a boy.

Okay?

You look great. Welcome aboard. Good place - Wait a minute - The chart I didn't get, deploy color chart on undisturbed surface. Didn't make it. Contingency sample area I got, and LMP egress I got. I'm off for S-band antenna.

Okay. My, but that Sun is bright.

Yes, take it easy.

It feels good.

Yes, you really do begin to adapt. You hop a little bit. If you turn around and walk over to your right a little bit and look over that crater, you're going to see our pal sitting there, and that's one steep slope it's on. Okay, now what have you got all over your boot? Stop. You picked up a piece of landing gear. ...

Okay. There you go.

That a boy.
Okay, I'm going into -

Hey, you've got to watch it in these shadows.

Yes. You can't see what you're doing. Come over here where I am. See that Surveyor sitting there?

There that thing is. Look at that.

Will you look how close we almost landed to that crater!

Beautiful, Pete.

Look at the descent engine. It didn't even dig a hole. Okay.

Houston, I'm need to process --

Pete, Houston.

Go ahead, Houston.

Hey, Al?

Yes?

I got to save this paper. Would you get --

Pete, will you give us status the - on the LM and also some comments on your boot penetration?

Okay. My comment's are exactly the same as Neil's. In fact, everytime I get down in one of these little craters, I sink in a lot further. I'd say our footsteps are sinking in -

What do you want to do with it?

Put it over by that Y-gear. I think I cover that rock box with it later. Remember, last minute change. And -
Hey, wait a minute. You want ...?

Oh, ... I think it's pretty much the same as Neil and Buzz found, don't you, Al?

I do. One thing I've noticed; it seems to compact into a very shiny surface. I guess the particles are very small and very cohesive, so when you - every bootprint, as you look at it, it looks almost like getting a piece of rubber itself. It's so well defined, and you can't see any grains in it or anything.

Al, can you find - can you find the Earth?

Where's the Earth?

Oh, there it is; I can see it. Hello there, Earth.

Where is it?

Just look at the S-band antenna and look up that way; it's right up there.

I'll have to back up a little.

Okay. Now - Where did we all agree was the best place to deploy this S-band? ... the Y-gear, huh?

Yes. A little bit further out.

That ought to - Here's a good spot. Hey, I don't want to get too far away from the cable.

What's the - what's the matter with right here?

That's a good place.

Okay.

Point to Earth.

That's what it says.
<table>
<thead>
<tr>
<th>Time</th>
<th>CDR</th>
<th>LMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 19 54 57</td>
<td>Okay.</td>
<td></td>
</tr>
<tr>
<td>04 19 54 58</td>
<td>I'm glad you didn't land back about 50 feet.</td>
<td></td>
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<tr>
<td>04 19 55 00</td>
<td>That's what I'm saying, buddy (laughter).</td>
<td></td>
</tr>
<tr>
<td>04 19 55 03</td>
<td>Hey, you can see some little shiny -</td>
<td></td>
</tr>
<tr>
<td>04 19 55 09</td>
<td>Glass.</td>
<td></td>
</tr>
<tr>
<td>04 19 55 10</td>
<td>Right - glass, in these rocks.</td>
<td></td>
</tr>
<tr>
<td>04 19 55 12</td>
<td>Yes, I reported that.</td>
<td></td>
</tr>
<tr>
<td>04 19 55 16</td>
<td>You can also see some pure glass, if you look around. You can jump up in the air.</td>
<td></td>
</tr>
<tr>
<td>04 19 55 24</td>
<td>Hustle, boy, hustle. We got a lot of work to do. I've got to do my PAN's in 15 - 5 minutes here.</td>
<td></td>
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<tr>
<td>04 19 55 29</td>
<td>Okay. I'm doing some useful work, like getting that TV camera going.</td>
<td></td>
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<tr>
<td>04 19 55 33</td>
<td>Okay, good idea.</td>
<td></td>
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<tr>
<td>04 19 55 40</td>
<td>You really got to be careful when you go out of the light into the dark.</td>
<td></td>
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<tr>
<td>04 19 55 44</td>
<td>Yes. Okay.</td>
<td></td>
</tr>
<tr>
<td>04 19 55 56</td>
<td>Okay. Move position 20 feet and 10.</td>
<td></td>
</tr>
<tr>
<td>04 19 55 57</td>
<td>Hey, I got a - This second thing won't come out. Hey, give me a hand here.</td>
<td></td>
</tr>
<tr>
<td>04 19 56 07</td>
<td>Yes, sir; what can I do for you?</td>
<td></td>
</tr>
<tr>
<td>04 19 56 09</td>
<td>This second S-band thing won't deploy.</td>
<td></td>
</tr>
<tr>
<td>04 19 56 11</td>
<td>Well, do you want me to pull or hold?</td>
<td></td>
</tr>
<tr>
<td>04 19 56 13</td>
<td>On this?</td>
<td></td>
</tr>
<tr>
<td>04 19 56 14</td>
<td>Yes. On this. Pull. Pull away from me.</td>
<td></td>
</tr>
<tr>
<td>04 19 56 17</td>
<td>Okay.</td>
<td></td>
</tr>
</tbody>
</table>
Okay, never mind; forget it.

You get it?

No - I don't think it's - Let go, let go.

Try a different -

I got it; never mind.

That's not right, is it? Doesn't that thing have two sections to it?

No, never mind; forget it; let's go.

Hey, Houston. Does the inner mast - It's just one piece, huh?

Copy the question. You want to know if the inner mast is one or two sections.

Yes. It seems to me - I'm getting dumb-dumb, maybe. It looks shorter than it used to look in practice for some reason. I thought there was more than one section - -

Pete, that inner mast should be two sections.

-- I think so; you have to pull out this. The top side ... in the inside.

Move this TV over - cable over here by the front porch.

Okay. Do you know --

The TV is almost off.

-- you know, it is significantly easier just to do anything here. Just like this arm motion is so simple because you're not fighting the rest of your weight like you are there in one g.

All set? Okay.

(Laughter) Look at that; that leg doesn't want to - Go on down, leg (laughter).
Okay, let's get that TV out and show everybody.
Wait a minute. Lock inner mast; lock outer mast; extend and lock brakes - we've done; align; remove thermal cover. Okay? We want thermal cover.

Goodby.

Okay, Houston, I'm going to move the TV camera now.

Roger, Al.

Hey, it's real nice moving around up here. You don't seem to get tired. You really hop like a bunny. Where, oh where is Earth? There it is. Here is the TV. And let me set this - Pointing toward the Sun. That's bad. Point it here a minute. Dum de dum dum dum dum dum.

There's that. Look at that go (laughter).

Hey, Red, I was going to deploy this 20 feet and 10; but, because of the Sun being where it is, we're going to have to deploy it a little bit more toward the 2 o'clock position. I think that will be okay though. That will give you a good shot; right in here. I'll see if I can keep the Sun from getting in the camera at all. I'll have to move it ... hey, am I --

Al, we have a pretty bright image on the TV; could you either move or stop it down?

Okay, I'm going to have to stop it down. That's as far as it goes, Houston. How does that look to you?

No, it's still - still looks the same, Al. Why don't you try shifting the scene?

Okay, I'm going - The problem is the LM is very reflective. Let me - I got two choices. Let me go over here further to the side, and you check and see if it reflects too much; and if it does, I'll have to go stick it in the shade. And then maybe shine past the LM; of course, that makes it not be too good either, but it may be the best we can do. See how this looks to you, Houston.
Okay, Al. And also, you might try the automatic light control to the OUTSIDE.

Okay, Al, watch.

Wait a sec. Let me go --

I got --

How does that look, Houston?

Still looks the same, Al.

(Laughter) Man, oh man, did that thing deploy!

Well, I'll tell you what let me do, Houston. Let me move it around here back, so the back is to the Sun, and maybe that'll help. Maybe that's the way we're going to have to do it.

Okay, Al; go ahead.

Once we learn the trick here, I think we can do it each time. That may do it; that may do it, right there, Houston.

Al, we haven't seen any change at all. Why don't you go and take and put your glove in front of the lens, but not over it, to see whether we can get any change at all.

What do you see now?

Still the same, Al. We've got a very bright part - about 20 percent of the top, and black on the bottom.

Well, got any suggestions? I'm pointing it in a nonbright area. Let me point it --

Stand by, Al.

I - got it pointed away from the Sun here. It may be ground problems. I hope it is. All the connections look good.
Hey, Al, why don't you take a good close look at the lens and make sure it's in the right configuration?

Okay, I've got it on at focus at infinity; I've got the zoom at 30 or 40 or 50; I'll put in 75; and I got the f-stop at 22.

Roger, Al; we copy.

I've got it pointing exactly opposite of the Sun here, so -

Al, we see no change at all in the scene. Why don't you just give it a little tap? It may be the color wheel is hung up.

I put this antenna up 1 foot too close.

Hey, Houston, it won't hurt if my PLSS antenna hits this S-band antenna, will it?

Stand by on that, Pete.

Pete, that's no problem.

Okay.

Hey, Al.

Yes.

Come over here. You're going to have to help me line up this antenna.

All right. Houston, I'm going to leave the camera just pointed off in the distance. If you get any ideas, I'd be glad to work on it for you.

Roger, Al. Try and point it off where you don't get any reflectance into it, and we'll be thinking about it here on the ground.

Okay. The plug that runs right into the back of the TV, it's sort of a white plastic material, and it looks like it's cracked and maybe been melted a little bit. It doesn't look typical of that sort of connector.
Stand around to the back. No, no. No, you got to go around - go around so you can look at the antenna and tell me when I've got it pointed at the Earth.

All right.

No, don't get underneath it. That a boy.

Okay.

Now. Whoops, see what I mean; this thing - you're going to have - really going to have to watch that ALSEP. You could trip over this whole antenna without even blinking at it.

Okay, go ahead.

Can you see the Earth?

No.

You've got to get around here. The Earth and the Sun are right lined up. You're going to have to look right into the Sun and look up in the sky. Watch it; you're on the TV antenna - I mean cable.

Okay.

See what I'm trying to do? I've got to pitch over now, right?

Yes. Oh, there it is. I got you now. Bet we can hide it.

Yes.

I tell you where you need to go, Pete. Okay, that's good. Now you need to point - you need to rotate the whole thing counterclockwise. That's good. You're getting there - getting there. That old Earth's just hanging up there.

Okay. How much further?

Oh, I'd say another 3 or 4 degrees maybe. Stop. Good boy. Okay, now. Wait. That looks just good, as far as angles. Now, up and down -
I can move it in a little closer, but -
Okay, come down with it.
Watch it now; I'm going to try to kneel down.
Come down. Come on down.
Coming.
Okay, stop. Now - now go clockwise. All right, a little more. I think you're pretty close to right on there, Pete.
All right, now wait a minute. Don't - don't let me knock it over, but I got to -
Okay. I'm trying to stabilize it for you.
Yes, but every time you do, you push it in the -
Okay. You go ahead.
That's difficult ***. It's so tender up here on these legs.
Yes. I know.
I don't see the Earth anywhere in the sight. Too close. Got any ideas of which way to go?
Yes. Just like that.
Say, we're going to have to - let's push these legs in a little bit and get this thing more stable. Get this thing in the dirt.
Okay.
Don't break them. That thing is delicate.
I know it; now, it's in the dirt. Now, let's line her up.
Okay. Can you look right down the mast?
Yes. It looks like it's lined up to me. We'll just have to move in and try it, because you're awfully close -

About as - How is it in azimuth? And I'll look for it in pitch.

Come a little bit more clockwise. You're right on it, babe; stop. Now, run it up and down in pitch, and you're bound to get it.

No. I've got to go the other way and get it. Whoops! I just saw the Earth. Hold it. Take your hands off it.

I can't; it'll fall over.

No. Leave it alone. --

You're pulling on it. You're pulling on it, here.

Leave it alone.

Okay, I've got my hands off it. It's standing there.

Oh.

Be delicate, because this pulls on it, see?

Yes.

Got it?

You want me to go work on something else now?

Yes.

Okay. Looks good. Just be careful you don't move it any closer to the right side of your PLSS and bump it.

Okay?

I'll put out the solar wind collector. Before I do, let me get a camera out here so I can take your picture, Pete. *** get out that solar wind collector.
Okay. Earth, I have you in the S-band antenna sight. Now, what's next?

Okay. To me, it's solar wind collection.

Okay. How much time, Houston?

Al, when you finish up the solar wind, would you give one more last try on that camera?

I sure will.

Try opening up the f-stop all the way and exercising the zoom.

I sure will. Boy, we sure don't want to touch those cables.

No, we've got to stay away from those cables; you're right.

Got a camera with you?

I certainly do.

Okay, just hang on to it. Houston, how much - how long have we been out?

Pete, you've been out 1 hour and 2 minutes, and you're both running about 2 minutes off nominal, behind.

Okay.

Looks like a good place for the solar wind collector, Pete. I think I'll stick it right here.

Where are you?

Right here.

Okay.

I'm planting it right here.

Okay.
Got to get back on this time line in a minute.

Yes, let's go, boy. I knew we were going to run late. Ding-a-ling TV didn't help.

Okay. Solar wind collector, do your collection.

That looks good. Okay, come here! I've got something for you. Let's go.

Okay.

A hammer. Now. Take the hammer --

Wait, wait. Want me to bang that TV first?

Yes, yes.

How about right here?

Okay.

Right here's a good spot.

Okay.

Okay. Right here.

No.

Right here?

Yes.

Goes right in the ground.

Yes, that's no problem, is it?

Those poles just drags right in. Okay.

You might go whistle on the TV.

Okay, I'll go work on it a little bit.

Okay.
04 20 14 41 CC  Al, we copy your comment on insertion of that into the ground. How far in are you able to get it?

04 20 14 45 LMP  Oh, I pounded it in over a foot, I'd say; and it didn't look like it was any harder towards the end than right at the beginning. It's there. It's pretty -

04 20 15 00 CDR  I'll tell you what, Al -

04 20 15 01 LMP  Okay, now, I'm going - Houston, I'm going to move the fo - move the focus a bit and see what happens.

04 20 15 12 CC  Roger, Al. Go ahead and don't spend too much time on it. You're running a tad behind.

04 20 15 15 LMP  Okay, well, I'll tell you what. I can feel that the wheels, when I hold the - when I hold the end of the lens, I can feel the wheels running, because I can feel something in motion inside. Okay, now, I just changed completely the settings I had before. The f-stop's is still 22, but I can try something else -

04 20 15 36 CC  Okay, Al, we see no change down here. Why don't you press on?

04 20 15 38 LMP  Okay, let me - let me try another f-stop, the other way. How's that?

04 20 15 50 CC  There's no change down here, Al. That's coming in there, now, Al. Okay, what change did you make?

04 20 16 00 LMP  I hit it on the top with my hammer. I figured we didn't have a thing to lose. I just pounded it on top with this hammer I've got.

04 20 16 10 CC  Skillful fix, Al.

04 20 16 11 LMP  Yes, that's skilled craftsmanship. ***

04 20 16 15 CDR  Hey, that's - Al -

04 20 16 17 LMP  Yes, sir.

04 20 16 18 CDR  That part has already sheared this thing.

04 20 16 23 LMP  Never touched it.
04 20 16 25  CDR  Okay.

04 20 16 26  LMP  What should we do now with the lens, Houston?

04 20 16 36  CC  Okay, why don't you give it one more light rap, and also cut down the f-stop?

04 20 16 41  LMP  All right, will do. Now, is the zoom right for you?

04 20 17 02  LMP  ...

04 20 17 03  CDR  Oh, darn. ... you really got this, Al.

04 20 17 04  LMP  Okay.

04 20 17 05  CDR  Down the ...

04 20 17 14  CC  Al, we're still not getting a good picture. Why don't you press on, and we'll try to get back to it later, if we have time.

04 20 17 19  LMP  Okay, I'll pound it a little bit. There you go. I'll just leave it like it is, pointed slightly towards the LM here, so that if you do get a picture, you'll see something.

04 20 17 34  CDR  Ready to go now.

04 20 17 35  LMP  That ought to give you some sort of a picture that you can think about. I'll be glad to come back and work on it. Got to go to work again.

04 20 17 41  CDR  Al?

04 20 17 42  LMP  Yes, sir.

04 20 17 43  CDR  What I need is a piece of tape.

04 20 17 46  LMP  *** get some.

04 20 17 47  CDR  Good luck.

04 20 17 49  LMP  Oh, there's all kinds of tape around here.

04 20 17 52  CDR  Okay.

04 20 18 40  LMP  I've had it on this thing.
04 20 19 25 CDR  Houston.
04 20 19 30 CC  Pete, go ahead.
04 20 19 31 CDR  Okay, the flag is up. We hope everyone down there is as proud of it as we are to put it up.
04 20 19 39 CC  Roger, copy. The flag is up. We show you are very close to the nominal time line. How about an EMU check?
04 20 19 46 CDR  Okay. We have the flag up. Like I said, I hope everybody down there is as proud of it as we are to put it up.
04 20 20 04 CC  Affirmative, Pete. And we're proud of what you're doing.
04 20 20 16 CDR  Al?
04 20 20 17 LMP  Yes, sir.
04 20 20 18 CDR  Can we have a quickie here?
04 20 20 20 LMP  Okay.
04 20 20 30 CDR  Back up a little more -
04 20 20 31 LMP  Okay.
04 20 20 32 CDR  About 15 feet.
04 20 20 33 LMP  All right.
04 20 20 38 CDR  ... getting into the TV cable?
04 20 20 41 LMP  No, I just went right over it, babe.
04 20 20 42 CDR  (Laughter)
04 20 20 43 LMP  Here you are. Take a look, Pete.
04 20 20 46 CDR  I can't see you.
04 20 20 54 LMP  Get it?
04 20 20 55 CDR  Sure did.
Okay.

Another one?

Wait 1.

Okay, got you.

Okay, that's good.

Okay, get back working, while I go get my camera. I got some PAN shots and next the ALSEP. And, Houston, I'm down on MIN cooling.

Roger, Pete. How's Al doing?

Say again.

Is Al doing all the work?

No, sir. I'm headed out to do the PAN photographs right now; and, with any luck at all, we'll get back on the time line and complete what we need. Al's taking shots of the solar wind, and I'm hopping out here to the number 1 slot.

Boy, you sure can move on this surface.

Roger.

Yes, but watch it when - watch it when you hit a rock.

...

Okay, go f:ll; f:ll it is. 1, 2, 3, now f:8, 4, 5, 6, 7, ***

7.

Clipper, you were broken up. Say again.

Who are you talking to?

Pete, we have Clipper both - and you both on the same air to ground - Clipper, go ahead. Say again.
04 20 24 16  CC  Roger, Clipper.
04 20 24 45  CDR  1, 2, 3, 4, 5, 6 -
04 20 25 16  LMP  Do you hear a little background noise, Pete? Kind of staticky and things?
04 20 25 19  CDR  I keep hearing a whistle.
04 20 25 42  CDR  Okay, Houston, two of the PAN's are done.
04 20 25 51  CC  Roger, Pete. Copy. Two PAN's. Al, how was the IM inspection?
04 20 25 54  LMP  I'm working on it right now.
04 20 26 01  CC  Roger.
04 20 26 03  CDR  Taking a look at that Surveyor, Al; I should suspect we ought to be able to get there quite readily. I'm going to head down there by the crater a little bit for this set of PAN's - whoops ...
04 20 26 12  LMP  Watch yourself; it's easy to slide.
04 20 26 14  CDR  Yes, you can say that again. I notice you've been over here, haven't you?
04 20 26 20  LMP  Yes. ...
04 20 26 27  CDR  I don't think this is going to show anything, but I'll give it a go.
04 20 26 31  LMP  What's that?
04 20 26 32  CDR  Oh, I'm trying to show the front gear here and how it went - how it planted itself, but it's not really - it's not bright enough.
04 20 26 44  LMP  Give it a go, though.
04 20 26 57  CDR  Uh-oh.
04 20 26 58  LMP  Bad?
I think my camera's -
This pad bounced.
*** your plus Y bounced about pad diameter.
That'd be an interesting picture there.
Al, do you have any comments on the footpad interaction with the surface?
Yes, I do. Actually we - Pete's pads went in a little bit further than did Neil's; I'd say most of the pads are in about an inch and a half to two, and it sort of looked like we were moving slightly forward, and that pretty well killed off our left-right velocity when we touched down. The right-hand footpad seems to have bounced; that'd be the plus Y, the right-hand-side one; the others don't seem to have. So it must have - maybe hit there first, and rocked back and forth or something.
Roger, Al. Do you see anything on the surface from the DPS?
No, I don't. The surface under there - It's kind of interesting - The surface under there is clean. It doesn't have the loose dust particles that - as does the rest of the lunar surface about here. It also has a number of small round dirt clods, if you want, that seem to be ... off in a radial direction from underneath the skirt of the engine. I'll take a couple of pictures ... good shots ... just about 8 inches or so off the ground. I think I can get a good one for you, Houston. There we go.
Thank you, Al. It's a good description.
Say, you can really move around out here, Houston. That a mobile POGO ridge that we've got there, and also that one in the centrifuge - Man, it's just like this. You can just run and bounce just like you can on that POGO. It's a real good training device.
04 20 30 07  CDR  Where are you, Al?
04 20 30 09  LMP  I'm over here back - the back tee - I'm ready to -
                  to start the ALSEP ... when you are.
04 20 30 14  CDR  Okay. I got the ... and I'm coming around.
04 20 30 16  LMP  All right.
04 20 30 18  CDR  Okay, Houston, I went back to intermediate cooling.
04 20 30 27  CC   Roger. We copy that.
04 20 30 28  LMP  Good idea. Say, I've noticed when you get started
                  moving down that way, it's sometimes hard to stop.
04 20 30 35  CDR  Yes. Hold on to this.
04 20 30 37  LMP  All right.
04 20 30 38  CDR  We're putting on our saddlebags now ---
04 20 30 42  CC   Pete and Al, you're 1 plus 22 into the time line,
                  and you're running about 6 minutes behind nominal.
04 20 30 44  CDR  We're going to catch up right now ---
04 20 30 46  CC   We're monitoring PLSS feedwater 2 as a determining
                  parameter.
04 20 30 53  CDR  Okay, Houston. We'll start catching up now. We've
                  kind of gotten over the initial checkout on how to
                  walk and move around, and maybe we got - we won't
                  have any problems with this hardware like we did
                  with the ---
04 20 31 08  LMP  ... Here you go.
04 20 31 11  CDR  --- in the antenna.
04 20 31 18  CC   Roger. And we're showing 2 plus 30 left in the
                  EVA.
04 20 31 21  CDR  Okay.
04 20 31 27  LMP  Okay, Pete, your saddlebag's on.
04 20 31 29  CDR  All right, let's go.
Okay, and we're off to ... the ALSEP. ...

No. We ought to be able to move out with this thing.

The LM exterior looks real good. The LM exterior looks beautiful the whole way around. Real good shape. ... that doesn't look like it did the day we launched it.

Right.

Okay. Here we go, Pete. Ohh, up they go, ..., one ALSEP. There it is.

There it is, is right. It is laying on the lunar surface. Better go to intermediate cooling, get good and chilled down. Okay?

Hey, it's dusty, isn't it? You've got to go easy.

You sure do.

Here it comes.

Coming right up.

Hey, that's about right.

Widen that out on the boom, Houston. Sure looks pretty.

Roger, Pete. We copy.

Look at me, Pete. It's a good shot, babe. The LM and everything's reflected in your visor.

Lay her on the ground. Okay, I'll bring mine out.

Right out on the Moon, just like advertised.

Wait until I get this out of your way.

Okay.

Yankee Clipper, Houston. OMNI Charlie, OMNI Charlie.
It's going to look like --
Say again.
Going to look like the back of the flightcrew training ... in a minute.
Yes.
Okay. That, ... there is coming closed. Uh-oh. All right, you can push that door.
How do I ... that one?
I don't know.
Hey, Al, when I free this strap, would you mind ...?
Let me look, Pete. I have one here. Let me get it out for you.
Thank you, sir.
Okay, lift your left foot up and you're okay.
Okay. Thank you.
Yankee Clipper, Houston. High gain antenna: Pitch, minus 13; yaw, 225.
Hey, Houston, do you hear this constant beeping in the background? On the COMM.
That's affirmative.
What is it?
We've heard it now for about the past 45 minutes.
That's right, so have we. What is it?

Intrepid, we've tried to isolate it. It appears as though it's coming on the downlink where it's coming from the LM.

Hey, Al.

Just a second.

Hey, there's your lunar tools, all set up for you, fellow.

Okay.

This ALSEP's doing okay.

Old Chuck Wetherred will be happy to know we're throwing it up for him, here. That's all right.

Here you go. Now, what do you need of these?

I need anything you've got. There you go --

Good.

-- I need that tool.

How about this? You need that one?

How about the -- Here, let me put that on. No, no. You put that in package 2, and I'll pick that up later.

It's already in package 2.

Then, one must be yours.

Okay. Okay, I put that there.
04 20 39 44 LMP  Excuse me, Pete, I'll move it over and plant it.
04 20 39 46 CDR  Wait a minute.
04 20 39 47 LMP  All right.
04 20 39 49 CDR  Got to put this together right - Where's the arrow? We've got to let down the cap while we wait?
04 20 39 59 LMP  Wait a minute. Here you go.
04 20 40 02 CDR  Okay.
04 20 40 03 LMP  Put this together.
04 20 40 13 LMP  Houston, we're going to go ahead and put down the fuel cask right now, and then I'll take the filament out of it.
04 20 40 27 CC   Roger, Al. Copy. You're working with the fuel cask.
04 20 40 29 CDR  Wait, wait, wait, wait, wait.
04 20 40 33 LMP  I knew it. This is such a bad place to put it, Pete.
04 20 40 36 CDR  Huh?
04 20 40 37 LMP  That's a bad place to put it.
04 20 40 39 CDR  Yes.
04 20 40 42 LMP  Fuel cask comes down beautifully in position. Came down just right.
04 20 40 47 CDR  Oh, I know what I have to do, Al, and I'm standing here not doing it.
Okay, now you need to move the SIDE on in.

We're moving right along, Houston. We're ***

Yankee Clipper, Houston. Go to wide deadband.

Houston. You can log me for my first ... on the Moon.

Hey, Houston.

Something that's real interesting, as we put out this ALSEP right --

Pete, go ahead.

There's one thing that's pretty obvious, as we're setting out the components of the ALSEP here, is I just hope that these thermal coatings don't have to stay as white as they are right now, because there's just no way. With all this dust, there's just no possibility that --

You cannot get them a little bit dirty. And --

Little bit dirty isn't the word for it.

I know it. This - this - this - this - this is real - going to be a real problem, I guess, if thermally they've got to maintain ***. Everything that touches the ground picks it up. This suit is about half dirty because the strap landed on it. Uh-oh. It's a little dirty even on top of the fuel element, there. Okay.

Wait just a minute now before you - get carried away.
04 20 42 35 CC  Al, we copy your comments.
04 20 42 37 CDR  ***. Okay.
04 20 42 38 LMP  I guess we'll just have to make allowances for things like that when we build them. They sure are going to get dirty.
04 20 42 48 CDR  Okay, I'm unlocking the cask dome, right now. It unlocks perfectly, shaking it now and trying to get it off. There you go.
04 20 43 00 LMP  It came off beautifully. Put the tool and in the - dome aside.
04 20 43 07 CDR  Very nice.
04 20 43 08 LMP  Okay. I'll get out the cask removal tool.
04 20 43 17 LMP  You can stand over there, Pete.
04 20 43 20 CDR  Okay. I've got to - got to go back to MIN cooling. I'm about to freeze to death.
04 20 43 25 LMP  ...
04 20 43 26 CDR  Yes. Okay. Go ahead.
04 20 43 34 LMP  Yes, oh.
04 20 43 35 CDR  Okay, now start. There you go.
04 20 43 51 LMP  ... in there.
04 20 43 53 CDR  Okay, tighten up the locks ...
04 20 43 57 LMP  Hold it.
04 20 44 08 LMP  ... be chipped.
04 20 44 16 CDR There. Screw it all the way down. That could make a guy mad, you know it?

04 20 44 26 LMP Yes.

04 20 44 30 CDR Let me undo it a minute, and try it a different way.

04 20 44 32 LMP Yes.

04 20 44 36 CDR It can really get you mad. Houston, Al put the tool on, screwed it all the way down, and the fuel element would not come out of the can. He's taking the tool off, and he's working it again.

04 20 44 56 CC Roger, Pete. We copy.

04 20 45 11 CDR You got any suggestions?

04 20 45 15 LMP ... kind of surprised me there.

04 20 45 23 CDR ***?

04 20 45 24 LMP Come over and look.

04 20 45 26 LMP I tell you that worries me, Pete. If I pull on it too hard, there's a very delicate lock mechanism.

04 20 45 31 CDR Better not push the pins in quite so far, and wiggle it a little. I just get the feeling that it's hot and swelled in there or something. Doesn't want to come out.

04 20 45 40 LMP I can sure feel the heat, though, on my hands. Come out of there, rascal.

04 20 45 53 CDR Suppose it's outgassed or something?

04 20 46 02 LMP Say, Houston.

04 20 46 08 CC *** ahead.

04 20 46 09 LMP Okay. We've really got a problem, I guess. I've tried using different pins; you know, it's got a three-pin removal --

04 20 46 17 CDR Dual.
-- so I tried using different pins in different holes. That doesn't appear to have any effect. It operates - You know - Everything operates just exactly like it does in the training mockups - and - up at GE. The only problem is, it just won't come out of the cask. I am suspicious that it's pulling in there or something and friction's holding it in. But it's such a delicate tool, I really hate to - to pull on it too hard. I believe what we can do, Pete --

Hey, I'll be right with you.

-- go get that hammer and bang on the side of it.

No. I got a better idea. Where's the hammer?

That's what I said.

No, no. But I want to try and put the back end in under that lip there and pry her out. Let me go get the hammer. Be right back. Where did you put it?

Huh? What? Hammer's on the MESA.

Okay. Let me get the tool off. It's starting to warm up.

Okay.

Can't figure that out, Houston.

Hey, now.

Look, Pete.

Huh?

Al, when you're working on that, try to make sure you've got the pins all the way in, tighten up on it; then you can try pushing down on it a little, before you pull it out.

Okay. Don't - don't touch these. These are - If these break off, that's all she wrote.
Yes. I understand.

And don't pound on anything that'll break.

No, no. I'm not going to.

Okay. We'll try it again.

Rotate and try it this way.

Pry's in there just like you - going to do the job, only it just doesn't do the job.

Oh man, look at the dust fly.

Just a minute. Just - just a minute. Get those pins in here again.

You're not getting those pins all the way in.

They're not in now because I'm lining them up. Just a damn minute. Now, they are all the way in.

They're all the way in - not quite. That bottom one down there's - Now, my recommendation would be pound on the cask ...

Yes.

Hey, that's doing it; give it a few more pounds. Got to be harder than that. It's going - It's coming out.

Keep going.

It's coming out. Pound harder.

Keep going. ...

Come on ...

Keep going, baby. That hammer's a universal tool.

You better believe it; there you got it.

Got it. Got it, Houston.
04 20 49 19 CDR (Laughter) That's beautiful. That's too much.
04 20 49 21 LMP Now, I think I'll put the --
04 20 49 25 CC Well done, troops.
04 20 49 26 LMP We got it, babe. It fits in the --**
04 20 49 38 LMP Hey, don't ever - don't ever come to the Moon without a hammer.
04 20 49 40 CC Yankee Clipper, Houston. One minute to LOS.
04 20 49 42 LMP That's it, Pete.
04 20 49 48 CDR (Laughter)
04 20 49 49 LMP That's outstanding.
04 20 49 50 CDR (Laughter)
04 20 49 55 LMP Make our move -
04 20 49 56 CDR I'm ready. ... going.
04 20 50 03 LMP Okay, Houston. The fuel element is in the RTG.
I can feel it radiate heat already. Put your hand over here, Pete.
04 20 50 13 CDR That's amazing. Wait a minute - no.
04 20 50 15 CC Copied that, Al.
04 20 50 16 CDR No, wait a minute, Al; have you got it strapped around your boot? Let me look and see.
04 20 50 19 LMP Okay.
04 20 50 21 CDR No, you're all right.
04 20 50 22 LMP All right?
04 20 50 23 CDR Yes.
04 20 50 24 LMP Boy, this thermal coating doesn't mean a thing here.
Yes. That thing is really getting covered with dirt. My gosh.

I hope they made allowances for it.

*** do. Okay. .... ....

It doesn't look like it's - Let me look at that just a second.

Okay.

It's the right way.

That's it.

Hey, feel the heat off that machine. That's amazing.

1400 degrees.

Almost as hot as the Sun.

Okay. Sure it is (laughter).

Hey, do me a favor.

What do you need? ...

No, go lower. There you go; you got it.

Okay. Okay, let me go - scout - smoke over the area. Okay. Okay, let me go - scout - smoke over the area. Okay.

Got everything you need?

All right, there's no TV, so I got the SIDE - and the picker-uppers for the rocks.

Okay.

Okay. Let's go right off to that little mound over there. How does that grab you?

Okay. Something's wrong.

What's the matter?
04 20 51 47 LMP *** The thing doesn't - *** Okay. Okay, Pete.
We're okay.

04 20 51 59 CC Pete, we copy. You've got the UHT tongs and sub-
pallet.

04 20 52 05 CDR We're making our move, Houston.

04 20 52 09 LMP Ahhh, I can tell this is going to be work - out.
Now, take it easy.

04 20 52 14 CDR How long did you say our shadow was - the LM's
shadow, 150 feet?

04 20 52 24 LMP No, that isn't any 150 feet.

04 20 52 26 CC Stand by, Pete.

04 20 52 32 CDR Take your time, Al; I'm just going out --

04 20 52 34 LMP That's what I'm saying. What's the hurry? We got
it made.

04 20 52 36 CDR No, I'm just going out to scout the area, that's
all.

04 20 52 38 LMP Okay, I'm going to set it down and rest.

04 20 52 40 CDR Okay.

04 20 52 41 LMP Go to intermittent cooling.

04 20 52 42 CDR ***

04 20 52 43 LMP Okay.

04 20 52 53 LMP You know, they ought to build this equipment for
lunar operations some other color besides white.

04 20 52 57 CDR (Laughter)

04 20 53 06 LMP I'm going to go right up to the head crater, I
guess.

04 20 53 12 CDR Well, if you're going to do anything --

04 20 53 20 LMP *** let me move it. Move it some more. Got any
directions you want me to go?
Well, it looks to me like either the direction you're headed is good or the one a little bit more to the right. You're going to - you're going to have to go far enough so we don't end up in one of the craters when we start to ... deploy.

Okay.

Okay.

But I want to go 10 degrees off our takeoff angle; and I think I'm headed out about that way now.

Okay.

You just stay back there and take your time. I'll go out here and scout the area.

You're getting pretty far out.

Huh?

Getting pretty far out.

I'm going to do a slow --

Pete and Al, your LM shadow should be about 110 feet.

Okay, I'm looking for - I'm dying to find out what this mound is over here anyhow, Al. We got a very peculiar mound sticking up out of the ground, Houston, that I want to go look at. As a matter of fact, I think I'll go take a picture of it. Oh my -

Look at how that LM is ...

... is it?

Roger, Pete. Could you give us your position and distance with respect to the LM?

Wait 1.

Go ahead, Pete, and do what you're doing. Pete's about - I'd guess, about 300 feet at 12 o'clock.
He's in the bottom of a shallow crater that you probably see on your map. It's sort of a doublet. Okay?

I'm headed to the right-hand edge of the head crater.

Hey, Al. Here's a neat spot to put it out up here.

Is it flat for a good piece?

Oh, you'd better believe it.

Okay, we'll put that - It's a good long ways away, too; it must be at least - what - 500 feet from the LM?

I don't know.

600?

It's the world's most peculiar - I got to photograph this thing. I can't imagine what it is. A mound is sticking up; and I can't imagine how it got there or what would make it.

Boy, you can cover the ground on this light-weight ... at one-sixth g. Really move.

I got to get them a stereo of this thing. It's really fantastic.

How's our time line going, Houston?

*** sit here and really rest awhile.

Pete, at 1 plus 48 into the EVA, you're looking good. Looks as though you're right on there, if you've just about completed your traverse.

We have, Houston. Yes. Yes. Now, look, Al. Look over here. We're way out from the LM. Over here, Al.

Okay.

See where I'm headed? This great big flat area.
That's a good - Hey, there's another one of those mounds over there.

Where? Hey, you're right. What do you suppose they are?

I don't know, Houston, what they are; they're just sort of mounds. Look like - don't take this the wrong way. It looks like a small volcano, only it's just about 4 feet high; and it's about - at the top, it's about 5 feet across; and it then slopes from the top on down to the - level with the terrain, and that - that diameter, that circle - where it finally becomes level with the terrain, is about 15 or 20 feet. So, it looks sort of like a small volcano. There's a couple of them out here. They look like they were formerly made out of mud or something.

Al, Roger. We copy. Is there any hole or central vent?

I don't know. I'm not --

I got to go over - we'll - we'll --

We'll go look them over.

-- ... after we get the ALSEP out. There's a couple of them here. There was a - This is a - We couldn't ask for a better spot to put this ALSEP down.

No. This is nice.

***, too.

Hey, lot more rocks up here.

Listen, there's a - We could play geologist for 2 days and never get any further than we are right now. Seeing all different kinds of things.

Hey, here's a different one.

Yes. It's really neat. Better than any ... geology in Houston (laughter).
I'm getting a quick PAN of the area here to ... down this ALSEP deployment - There you go.

Okay, man alive.

Tired?

No, I'm not so tired. That handle, you know, when you carry this thing around in one g, the ALSEP tends to hang down, but you carry it around up here at one-sixth g, in particularly, the RTG tends to rotate - and the whole pallet, so, in a few minutes, you've got one up - kind of halfway up in the air and the other one's down by your left leg, and you keep being afraid that this handle's going to come undone. It doesn't - Your handle doesn't lock. Okay. I have to almost - That's slick. You know these neat little decals we got on here?

Yes.

You can't hardly read them in the sunlight because they don't have enough contrast to them. They're so bright.

Okay, let's move them.

Okay. Let me make sure now that we're not going to run out into some holes.

That's pretty good. Pete, I'm going to move just a little bit further to the east - correction, to the north, so that I won't end up over in that hole to the side. Okay?

All right. Yes, I think it would be a real good spot.

Okay, I'm --

Awfully frustrating.

Now, I think this is the spot, Pete, right here.

You look and make sure now that we're going to have a good place for everything.
04 21 00 00  LMP  Yes, we will. Magnetometer can sit over there
and the seismometer will sit on a good flat place;
although the trouble with the seismometer, we don't
have any good solid bedrock or anything to set it
on. All we've got is this - this dirt. And I
don't see any area around that has any rock.

04 21 00 22  LMP  I'm afraid we're just going to have to take what
we can get on this seis --

04 21 00 25  CC  Roger, Al.

04 21 00 37  CDR  You know, this must be some thermal expansion or
something. I'm having a heck of a time getting
this UHT in this SIDE. It just flat won't go in
there.

04 21 00 47  LMP  Well, just pick it up with your hands. I always
handled the SIDE with my hands.

04 21 00 51  CDR  I can't bee - bend down that far.

04 21 00 52  LMP  Okey-doke. ...

04 21 01 46  CDR  Where'd you go, Al?

04 21 01 47  LMP  I'm right over here, babe.

04 21 01 48  CDR  Oh, you're miles away.

04 21 01 50  LMP  Yes, I am. I moved over here.

04 21 01 52  CDR  Oh, son of a gun.

04 21 01 53  LMP  I had to do it, Pete, so that I'd have a good
place for the SIDE.

04 21 02 04  CDR  Okay, there's a good spot. Looks good.

04 21 02 20  CC  Al, when you deploy that PSE stool, it would help
if you tamp that ground down as well as you could
before putting the stool down.

04 21 02 27  LMP  I'm going to try to do that. This - this ground
is - is not - you know; it doesn't get hard as you
move down a couple of inches - you can tamp it,
and that's what I'm plan to do; but I don't know.
We'll just have to see what happens. I - I'm worried about it getting a thermal short myself.

04 21 02 51 CC   Roger, Al.
04 21 03 06 LMP   Boy, I'll tell you.
04 21 03 08 CDR   Man, are you dirty.
04 21 03 09 LMP   Boy, this sure ... that ALSEP. Look at the ALSEP.
04 21 03 14 CDR   I know.
04 21 03 15 LMP   Ridiculous.
04 21 03 16 CDR   (Laughter)
04 21 03 18 LMP   I remember how they took care of this white paint. You had to have gloves to touch it.
04 21 03 20 CDR   (Laughter)
04 21 03 21 LMP   Remember?
04 21 03 22 CDR   Yes (laughter). They got kind of a problem here.
04 21 03 39 LMP   I'm going to have to do this myself. I'll have to do this backwards; but it's going to work right. Do me a favor, Pete.
04 21 04 03 CDR   I got my hands full, buddy (laughter). I'll be with you in a minute.
04 21 04 05 LMP   Okay. That's okay.
04 21 04 08 CDR   You can relieve me in this SIDE right here while I --
04 21 04 10 LMP   Well, I will, because it looks like you might --
04 21 04 12 CDR   Yes.
04 21 04 13 LMP   Give me that thing. Let me hold it.
04 21 04 14 CDR   Easy, easy. That a boy.
04 21 04 15 LMP   I got it.
That a boy. Now - wait.

Watch for - watch those cables.

Yes, but let me get it plugged in.

They sure splay around under this one-sixth g, don't they? It's moving around a bunch. ...

Watch it, watch it. Where's the orange stripe?

Should be same as on that other one.

Obviously, it's on the side I can't see.

Yes. Blue to blue.

You know that noise - that whistling - is coming from you, Pete, because every time you move around, it whistles. When you stop, it quits.

Is that right?

Yes. There it is.

Is it locked good?

Yes, sir. Okay, you're --

... that one over there?

...

Drop that baby.

Okay. You got it?

Let me have the cable right there.

All right. Oops! That came out.

That's what I wanted.

Okay.

That's what I wanted.

All right. Those lights came on nice.
04 21 05 22 CDR Yes.

04 21 05 26 CDR The next thing I got to do is head this way with it, right?

04 21 05 28 LMP No. Before you do that, come here a second, would you, please?

04 21 05 31 CDR Yes, but let me set it down.

04 21 05 33 LMP Uh-oh, the top popped open.

04 21 05 37 CDR Supposed to do that?

04 21 05 39 LMP No. Not supposed to do that. You can close it, though, before it gets any dirt in it. You can just reach up there and close it.

04 21 05 47 CDR Okay. You better - you better do it for me --

04 21 05 49 LMP ... close it while I'm holding it --

04 21 05 50 CDR Okay.

04 21 05 51 LMP Before we get any dirt on it.

04 21 05 52 CDR Son of a gun. Why did that happen? Never saw it do it before.

04 21 05 53 LMP *** We could still salvage that, though.

04 21 06 02 CDR Wait a minute. The little - the little -

04 21 06 03 LMP I see it. I see it.

04 21 06 05 CDR That a boy.

04 21 06 06 LMP Now, turn it - turn it over with your other hand, Pete. So --

04 21 06 08 CDR Wait a minute. Wait, wait. I'm going to ... it.

04 21 06 10 LMP I'm waiting.

04 21 06 12 CDR Where do you want to go with it?

04 21 06 13 LMP Well, I want to see if you - Let me get this. Okay. Now, let's see the other side.
This way?

That's - *** Yes. This won't - this won't hurt a thing. Yes. Wait a second.

That's it. You got it.

But just don't touch that. It'll be okay.

Okay.

Didn't hurt a thing.

Let me just put this down here.

Okay.

Pete, before you set the central station down for the final time, would you also tamp that ground down? It would help in keeping the dirt off of the thermally sensitive areas.

Oh, I did it; I did it (laughter).

You set it down.

I set it down and it didn't fall over. I can't believe it. Here I come. What do you need, Al?

Use your tongs to hold this up a minute. It's a little hot, and I don't want to touch it. Watch this.

Where are my tongs?

Right there in your - There you got them. Now, if you'll just hold it steady, then I can do the rest. There, now. That's good.

Thanks, Pete. Got it.

Okay. I'll go get the rest of the stuff over here. Where we at?

Okay. I'll work on getting these apart.
Okay. Take your time. Things's coming out real well. The name of the game is to get the ALSEP here. Whee! Up to one crater and over another (laughter).

Oh, man.

Does that - does that look as good as it feels?

It does. Hey, I'll tell you the way to do, Pete, bend and rock from side to side as you run. Like that. There you go.

(Laughter)

You really move better that way.

Here I come, ready or not.

Houston, I'm - I'm not kidding; we are really getting dirty out here. There's no way to handle all this equipment with all the dust on it. Every time you move something, the dust flies; and, in this low gravity, it really takes off, goes way up in the air, and then comes down and lands on you.

How far do you estimate we're from the LM? 600 feet? 700 feet?

At least.

I think you're right. 600, 700 feet.

Way to do it.

Here I come. Do do de-dum.

Dum dum de-dum. Coming after the antenna mast.

Okay.

Okay, let me plug this thing in, Pete.

I can't get down low enough to get it off.

I'll get it for you, if you can't.
Okay. Wait a minute. Let me move that dust cover for you.

How's that strike you?

Okay. Just leave this latch --

Hey, I'm making a joke --

Strikes me pretty good. I'll be tamping the dirt around this central station.

Okay. Going to have to design things with little legs on them or something, so you can put them down and they stand off the soil (laughter).

If we had that suit we could bend over in, we'd have the job done by now.

Hey, can you push down on this side of that?

Yes. My biggest sweat is trying to bend over. Wait a minute. Ready, get set, push. That on, or not?

I don't think so.

I don't think so.

No, let me - let me look at it a second. Here we - here we are.

Which way do you want this?

Under there. Right there.

I had to really push that other one. Look at all that dust.

Okay now -

Wait a second. Wait a second. Let me get it with you.

*** That got it, didn't it?

That did it, now.
That did it.

Now, we won't touch the shorting button. Okay. We've connected the RTG to the central station, Houston. And we're ready to go to work deploying the experiments.

I got the antenna mast.

All right.

De-dum de-dum dum.

Pete, did you experience any difficulty with the dust cover on the SIDE?

It opened, Houston, and we closed it again, and we got no dirt on it, fortunately.

Roger, Pete. Well done.

Okay. Let me tamp the dirt down underneath the central station. Hey, easy does it - Whoops! (Laughter) That's me.

What happened?

Oh, I started to walk away with the central station attached to the UHT via the little gizzy. Okay?

The RTG's down and cooking.

Okay. I'm tamping the dirt, here.

Okay.

Have I got it tamped pretty good? Look over where I'm tamping. How am I doing?
Looks good. Need a little bit more this way, I think. The problem with tamping, Pete, it looks like every time you tamp, as your foot comes up - you know it --

Yes. In tamping --

It redusts - it redusts the area.

Yes. Okay. Here we go, Al. Now, take your U - U - UHT, there --

Move that.

-- and keep the SIDE cable cleared.

Sounds good.

All right.

A little bit.

Here she comes. Over she goes. Get it right down ... No. There you go. How's that?

That's good.

Okay.

Ready to go to work.

Go. Have at it.

Okay, well, I got to - Let's see, I've got to get that solar wind, huh?

Don't know when I'm going to do the -

I better --

Houston, how we doing on the time line?

Do you read me, Al?
04 21 13 57  LMP  Sure do.
04 21 13 58  CDR  Hello, Houston. How we doing on the time line?
04 21 14 07  LMP  They may be talking to Yankee Clipper.
04 21 14 15  CC  Al, did you have a reading on the shorting amps?
04 21 14 17  CDR  Wait a minute. I'll get it. Hold the phone. Do you read me, Houston?
04 21 14 26  CC  Sure do; go ahead.
04 21 14 27  CDR  Okay. I was asking you how we were doing on the time line?
04 21 14 55  CDR  Can't see that needle anywhere. Can you, Al?
04 21 14 58  LMP  Let me see it. Let me help you. Doesn't it show any amps?
04 21 15 03  CDR  Place is covered with dust.
04 21 15 05  LMP  I know.
04 21 15 08  CC  Pete and Al, at 2 hours and 7 minutes into the EVA, you're about 5 minutes behind.
04 21 15 13  CDR  Okay.
04 21 15 14  LMP  Pull - hold me a little bit.
04 21 15 15  CDR  Wait a minute. Going back to MIN cooling. What do you need?
04 21 15 20  LMP  Hold - hold me to look.
04 21 15 22  CDR  Oh, okay. ...
04 21 15 27  LMP  I don't even see a needle in there.
I don't either. That's what's bothering me. It's not reading zero, and I don't see a needle.

I don't even see a needle in there, Houston.

Yes. Okay. Let's quit screwing with it. Get on the time line.

I don't know where it went.

Houston, did you get our last comment?

Negative, Pete. Go ahead.

We can't see a needle in the shorting amps anywhere. It's not at zero. It's not in sight.

Roger. We copy. Go ahead.

We're not done for the mag - for the seismometers, Houston. And I've sort of dug a little crater so that the - essentially the stool - the hole in the center of the stool, has - is de - is de - has more clearance between it and the ground. Hopefully, this will keep the SIDE from the ground at all. Going to try anyway.

Roger, Al. That's good. Go ahead.

--- ... the seismometer. We'll see - We'll see how it works. It looks like it might work. I tamped it also in the - in the small crater there.


Boy, you really have to be careful of these cables, don't you?

Hey, it looks good. Looks good.

Okay. After the solar wind, I get an EMU check and I'm down to MIN-cooling, anyhow; and it says LSM off load, two Boyd bolts. Wait a minute. Let me by. Whoops.

Okay, now.
<table>
<thead>
<tr>
<th>Time</th>
<th>Actor</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 21 19 06</td>
<td>CDR</td>
<td>Say, we have to be careful. Don't move sideways or backwards. You just don't know what's there. You've always got to move forwards.</td>
</tr>
<tr>
<td>04 21 19 12</td>
<td>LMP</td>
<td>Yes. Pete, could you shove the central station this way a little bit?</td>
</tr>
<tr>
<td>04 21 19 23</td>
<td>CC</td>
<td>Pete, we copy an EMU check.</td>
</tr>
<tr>
<td>04 21 19 25</td>
<td>CDR</td>
<td>Shove it?</td>
</tr>
<tr>
<td>04 21 19 27</td>
<td>LMP</td>
<td>Just move - just put your thing in the - in the holder, and just move it over this way a little bit.</td>
</tr>
<tr>
<td>04 21 19 33</td>
<td>CDR</td>
<td>I'm not sure I can do that, but I'll give it a try.</td>
</tr>
<tr>
<td>04 21 19 39</td>
<td>LMP</td>
<td>Watch it. There you go.</td>
</tr>
<tr>
<td>04 21 19 41</td>
<td>CDR</td>
<td>How's that for one-footed - La-dee-da?</td>
</tr>
<tr>
<td>04 21 19 46</td>
<td>LMP</td>
<td>Pretty good.</td>
</tr>
<tr>
<td>04 21 19 48</td>
<td>CDR</td>
<td>You make me knock my solar wind over, I'm going to be mad at you.</td>
</tr>
<tr>
<td>04 21 19 51</td>
<td>LMP</td>
<td>Okay. You're just - Here, let me give you a hand.</td>
</tr>
<tr>
<td>04 21 19 57</td>
<td>LMP</td>
<td>Make sure you - you hold it there.</td>
</tr>
<tr>
<td>04 21 19 59</td>
<td>CDR</td>
<td>Hey, don't - don't touch that. I've got a - one Boyd bolt off it.</td>
</tr>
<tr>
<td>04 21 20 03</td>
<td>LMP</td>
<td>Aren't you going to ...?</td>
</tr>
<tr>
<td>04 21 20 04</td>
<td>CDR</td>
<td>Huh?</td>
</tr>
<tr>
<td>04 21 20 05</td>
<td>LMP</td>
<td>Want me to help you move it that way?</td>
</tr>
<tr>
<td>04 21 20 07</td>
<td>CDR</td>
<td>No. It's got one Boyd bolt out of that magnetometer.</td>
</tr>
<tr>
<td>04 21 20 09</td>
<td>LMP</td>
<td>Okay. Okay. Go ahead.</td>
</tr>
</tbody>
</table>
What we're doing it, making a mess. You'd be better off - Let me - Listen, can you - you - leave - leave it sit. Let me hold that. You - you put that stool back here closer.

04 21 20 13  CDR

04 21 20 21  LMP  Okey-dokey.

04 21 20 22  CDR  Am I over all the cables?

04 21 20 24  LMP  Okay.

04 21 20 25  CDR  Huh?

04 21 20 26  LMP  No, you're okay. You got it?

04 21 20 28  CDR  Yes. Let me have it. All right?

04 21 20 30  LMP  Yes. Take your clip off.

04 21 20 32  CDR  Okay.

04 21 20 33  LMP  All right, now, you move your stool back.

04 21 20 43  LMP  ... a second.

04 21 20 47  CDR  Okay.  *** your EMU break.

04 21 20 51  LMP  I am.

04 21 20 54  CDR  I try to stay away from - That's a nice job on that solar wind.

04 21 20 56  LMP  Thank you. You've got to be careful you don't kick dirt on them once we get them setting down. I guess the way you could do it is have - have it in some sort of package - a package out on the dirt.

04 21 21 08  CDR  What are you doing anyhow?

04 21 21 11  LMP  Well, I had to get this - Oh, I'm sorry.

04 21 21 19  CDR  Here you go; move it up right here where my footprints are.

04 21 21 21  LMP  Okay.
04 21 21 23 CDR  There. That a boy. That a boy. Now don't -
doing good. There, now, kind of tamp it right
around in there. That a boy.

04 21 21 44 LMP  *** go off the central peak. Now, let's see what
happens if we set it right -

04 21 21 57 CDR  That's good.

04 21 21 59 LMP  That looks like it'd be okay, doesn't it?

04 21 22 00 CDR  Yes.

04 21 22 01 LMP  Just a second. Let me do a couple of things. Do
this ... Take ... a little bit out of there.

04 21 22 10 CDR  Pull it over a little bit more and level it up.

04 21 22 14 LMP  This doesn't - Yes, this doesn't need to be level.
Okay. That's got kind of a deeper hole there in
the center.

04 21 22 20 CDR  Yes. You're in good shape. That doesn't have to
level, huh?

04 21 22 22 LMP  No, because the - the other one levels ... this
stool.

04 21 22 25 CDR  Okay. Push it down a little bit.

04 21 22 27 LMP  Okay. That's a good idea.

04 21 22 30 CDR  *** it?

04 21 22 33 LMP  Looking good. Looking good.

04 21 22 35 CDR  Just give me the tongs, and I'll put them away.

04 21 22 37 LMP  Okay.

04 21 22 40 CDR  Get with it and I'll start opening Boyd bolts.

04 21 22 50 LMP  That's going to do okay, Pete.

04 21 22 53 CDR  Thank you.

04 21 22 54 LMP  Yes.
All right.

*** I'd whistle while I work. I can't do it.
(Whistle) Oh, yes, I can.

Okay. That seismometer's right in position now. Here's hoping. Here's hoping nothing happens to it.

Looks real good, Al.

Yes, it does. It looks like it's going to clear. Houston, looks like digging that little hole might work. Setting up there nice now, and it looks like maybe it's not going to ... down in the hole. Maybe - maybe we did it. We'll have to see.

Roger, Al. We concur; it sounds like a good plan.

Whoops!

Isn't that something? Look at that.

What? Just have to put a little dirt on it, I guess.

When I put out the skirt of this foil, it doesn't want to lie down. I guess because it's been folded so long. I guess I can just probably just put it out. It acts almost like it's got an electrostatic charge on it that's resisting the lunar surface. I'm sure that isn't it.

Hey, stop 1 second. Watch out. Don't - don't come across - don't - I know. That's what I want you to do is come take it.

Okay.

That cable isn't even unreeling. See, it's perfect. Take it out there and set it. That a boy.

It's right behind there. You may --

There you go.
<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 21 25 07</td>
<td>LMP</td>
<td>Just trip it. You might want to trip it — Trip it off that thing, Pete.</td>
</tr>
<tr>
<td>04 21 25 15</td>
<td>CDR</td>
<td>Trip it off what?</td>
</tr>
<tr>
<td>04 21 25 16</td>
<td>LMP</td>
<td>It's on that post.</td>
</tr>
<tr>
<td>04 21 25 18</td>
<td>CDR</td>
<td>Oh. All right. I see what you're talking about.</td>
</tr>
<tr>
<td>04 21 25 21</td>
<td>LMP</td>
<td>That shadow's going to be just right. Looking okay.</td>
</tr>
<tr>
<td>04 21 25 34</td>
<td>CDR</td>
<td>Oh, fiddle-de-diddle. Come on.</td>
</tr>
<tr>
<td>04 21 25 45</td>
<td>CDR</td>
<td>Okay. Everything is going great, but that whistle is driving me nuts.</td>
</tr>
<tr>
<td>04 21 25 52</td>
<td>LMP</td>
<td>A little bit.</td>
</tr>
<tr>
<td>04 21 26 01</td>
<td>CDR</td>
<td>Okay. Oh, darn it. I can't — can't help but get dirt on this darn thing,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>no matter how careful I am.</td>
</tr>
<tr>
<td>04 21 26 17</td>
<td>LMP</td>
<td>I don't think there's a way, Pete. I don't think there's a way. But you</td>
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<td></td>
<td></td>
<td>got if you got where you could — You put it out in a package and then</td>
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<tr>
<td></td>
<td></td>
<td>your last step was — like the SIDE over there, it just deploys off the</td>
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<tr>
<td></td>
<td></td>
<td>thermal wrapping, your dirt protector, and you end up with a nice clean</td>
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<tr>
<td></td>
<td></td>
<td>experiment sitting there.</td>
</tr>
<tr>
<td>04 21 26 46</td>
<td>CDR</td>
<td>How we doing on the time line, Houston?</td>
</tr>
<tr>
<td>04 21 26 51</td>
<td>CC</td>
<td>Stand by, Pete.</td>
</tr>
<tr>
<td>04 21 27 07</td>
<td>CDR</td>
<td>Whooo! (Laughter)</td>
</tr>
<tr>
<td>04 21 27 10</td>
<td>LMP</td>
<td>What happened?</td>
</tr>
<tr>
<td>04 21 27 12</td>
<td>CDR</td>
<td>Oh, it's just the way things pop off down here in one-sixth g. Okay.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Won't be long and I'll get to my favorite task, pointing the antenna.</td>
</tr>
<tr>
<td>04 21 27 31</td>
<td>CC</td>
<td>Pete, we show you're about 8 to 10 minutes behind but it's no sweat.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>You've got — you got lots of oxygen and feedwater. We'll give you an</td>
</tr>
<tr>
<td></td>
<td></td>
<td>update on the time remaining, when you finish deploying the ALSEP.</td>
</tr>
</tbody>
</table>
04 21 27 41 CDR/LMP Okay.

04 21 27 42 LMP Good. Looks like it's going real good, Houston. This seismometer, I'm having a little trouble making the skirt lie down; but, other than that, it looks good. It doesn't want to just lay flat like it does on Earth at one g. It sort of wants to flip up again. I guess it's just because it's got this memory in it from being folded so long, and the forces to make it lie down aren't too good.

04 21 28 10 CC Roger, Al. You can make a two-man task out of that and put a little dirt around the outside edge to hold it down if you like.

04 21 28 13 LMP Okay. Well, I noticed that if I just --

04 21 28 17 CC You won't have any trouble getting any dirt on it, will you?

04 21 28 18 CDR Let me push this down. That'll do it.

04 21 28 38 LMP Okay, Pete. Let me level it up. I think it's pretty near level. It's lined up exactly east. If I give it a couple of pushes.

04 21 29 10 LMP I got this feeling there's a couple of Boyd bolts that aren't undone here for some reason.

04 21 29 14 CDR Thing looks level as can be to me.

04 21 29 22 CC Looks good.

04 21 29 42 LMP Roger, Al. Copy. You have the bubble centered.

04 21 29 28 LMP I'll tell you an interesting thing about this bubble, Houston; no, it's okay. It's okay.

04 21 29 42 CDR I am not happy here, Al. I'm afraid something ... one these Boyd bolts is not undone, and I don't understand why.

04 21 29 55 LMP Why, one of them didn't do or what?

04 21 29 57 CDR Well, I don't know. I haven't the foggiest idea. I thought all of them did.
Looked like you're well ahead of the time.

Hey, take your stick and kick a little dirt up on it right there.

Huh?

Take your stick and just put a little dirt on the edge, just on the edge, though. Not much. Uh-oh. I got some bad news.

That's okay. I won't do that anymore. That's okay; that skirt'll stay down enough.

Okay. That's - that's complete. Let me take a couple of pictures of it. Okay, Houston. The passive seismic is down; the alignment is exactly 90 degrees, and I'm going to take a couple pictures of it here. Hey, Al.

Yes, sir.

I don't know what's the matter, but something is.

Here it is.

Okay. Would you look and see if the lens on my camera looks clean? Wait a minute.

There, you got it made.

No, I don't either. I don't know what's the matter.

Want me to hold down this part while you get that other bolt -

Push - push - push that center down. All right? Looks good.

Oops. Got it.

Very good.

That's beautiful.

Hey, it's alive (laughter).
It sure wants to come up, doesn't it? Whoo!

That did it.

That's beautiful.

That did it.

Houston, central station's up.

Roger. Copy. Central station up, and 90 degrees on the PSE gnomon.

Hey, Al.

Yes, sir.

Never mind. I'll get you in a minute.

Don't ever move backwards (laughter).

Hey, we're going to have to do a lot of - What did you do, fall over?

No.

No?

No, but I just - I didn't come close even - it's just that - I think something you want to follow as a rule --

But don't kick dirt on this --

I'm doing my best.

...

... and the central station is not level.

Not too bad.

Get a good shot of it here, Pete?

Okay.

Okay, I'll take out the - the magnetometer.
04 21 33 38 LMP  Central station went up so nice.

04 21 33 42 CDR  Al, those are my last two Boyd bolts.

04 21 33 45 LMP  Okay.

04 21 34 07 LMP  I'm down in a little crater now, Houston; and, sure enough, right in the bottom of the craters, there is a lot more - a lot softer dust than up on the rim. Not much; but it's noticeable. I don't think the sides are slippery at all. I don't think it's going to bother us going over to get our Surveyor ... about that distance, Pete?

04 21 34 34 CC  Roger, Al. We copy. You on your way out with the LSM?

04 21 34 36 LMP  That's right. Got it right in hand; I'm out at the end of the line, and I'm deploying the legs right now.

04 21 34 48 CC  Roger.

04 21 34 53 CDR  One antenna mast in place, Houston. Going back for the - my favorite thing.

04 21 35 01 LMP  Are you through with - you got all these other packing ... --

04 21 35 07 CC  Roger, Pete. Copy antenna mast in place and good luck.

04 21 35 08 CDR  What'd you --

04 21 35 09 LMP  Look at that, Pete.

04 21 35 10 CDR  What?

04 21 35 12 LMP  Hey, one of the fun things here, Houston, is all these Styrofoam packing blocks that come off - to - that are put on there to protect it during man - shipment, or launch - when you take them off and throw them, they really sail. These things stay airborne up for 10 seconds, maybe.

04 21 35 38 CDR  Got any more thoughts on our TV camera, Houston?

CONFIDENTIAL
04 21 35 42 LMP Pete? Pete.
04 21 35 44 CDR What?
04 21 35 45 LMP Watch this.
04 21 35 48 CDR (Laughter)
04 21 35 49 LMP (Laughter) Try that on - Hey, I just threw something. It hasn't hit the ground yet; it must have gone up 300 feet. Boing!
04 21 35 59 CDR (Laughter) Stop playing and get to work (laughter). Come on. Maybe they'll extend us until 4-1/2 hours. I feel like I could stay out here all day. ...
04 21 36 06 LMP I know it ... Right there. Okay.
04 21 36 23 CC Pete, we've been thinking on that camera, and when you get back, we'll have a test for you to run on it. It looks as though part of it's come back. And we're going to try and see what we can salvage.
04 21 36 32 CDR Ok - okay.
04 21 36 40 LMP What do you think happened to it, Houston?
04 21 36 53 CC Al, we're not sure on that. Why don't you wait until you get back - wait until you get back at the LM, and we'll work it out a bit and see if we can determine it?
04 21 37 03 LMP All right.
04 21 37 05 CDR Hey, Al?
04 21 37 06 LMP Yes, sir.
04 21 37 08 CDR Gee, that's nice. Gee, that's weird (laughter).
04 21 37 11 LMP (Laughter) Those arms, on Earth they just flop down in position. Here, they don't even want to stay. There they go.
04 21 37 20 CDR That thing hit the ground; it's still bouncing.
04 21 37 32 LMP That's slick. That's really slick. Boy, I hope - I hope -

04 21 37 46 CC Hello, Yankee Clipper; Houston.

04 21 37 52 CDR You hope, you hope?

04 21 37 54 LMP Oh, I was just thinking about something. Pete, no way to keep these things clean; I'm really worried about this white coating.

04 21 38 15 CDR Lucky for me that the antenna head is almost level.

04 21 38 42 LMP I can see that. This dot doesn't - doesn't seem hard to see.

04 21 38 48 CDR I'll see what I can do with it. There it is. Here it is. I think. Right there. Right in the center. Center.

04 21 39 16 CC Yankee Clipper, Houston.

04 21 39 17 CMP Hello, Houston; Clipper here.

04 21 39 24 CC Dick, the EVA - EVA is going pretty well; they're 2-1/2 hours into it; and they've got the ALSEP a good way deployed. Apparently, both of them look as though they just crawled out of a coal bin. Other than that, seems pretty much nominal.

04 21 39 38 CMP Very good. Thank you.

04 21 39 40 LMP Okay, Houston. The magnetometer's deployed; it's level, and it's pointed exactly east. And the little black dot is right in the middle ...

04 21 39 55 LMP Same -

04 21 39 56 CC Roger, Al. Copy.

04 21 39 57 LMP Same - Main concern here, there's just a lot of dust on top of the box and the electronics there. Just hope it doesn't bother it too much.

04 21 40 18 CC Roger, Al. Yankee Clipper, we have a map update for REV 19.

Okay, Pete, let me take a couple of pictures of this. ...

What are you mumbling about over there?

Well, I just - I just don't - I don't like all that dirt on it; don't know what we can do though. There's no way to work around them; the radiator's got a little dirt on it, and there's no way to dust it off, and there is no way - All you can do is tap it a little bit and hope some of it falls off and that's about it. Don't want to tap it too hard. That's the best I can do.

Okay.

Okay. Okay. I've deployed the SIDE now, Pete.

Okay.

It's my last item.

Not my last one.

Okay.

Does the antenna look like it's pointed at Earth? Wait.

It looks close.

That's it. ...

Okay.

Do the SIDE right now.

Got her.

Okay.

Okay. I hope I don't tug on the station here, as I come out, Pete.

If that happens -
It all looks pretty level, by the way. Your station does.

Yes.

We're nearing the end, I'll bet.

I'm done.

How's that -

Now it's just - (laughter) - They must have doubled the cable length on this one.

That does it?

Okay.

You're at the end. You're at the end.

Okay. Let me set it down and work on it right here.

That does it, old buddy.

Okay.

Okay. Now what do I want to do?

... do like that, does it?

Have you got the tongs?

What?

Have you got the tongs? Were they with that box - or do I have them?

You've probably got them on you.

I do? I can't see - No, they weren't with that box.

We used them - they're probably by your central station.

Hey, I got them on me.
Okay.

Okay, Houston, the antenna is up. It's aligned to 1644 and 525.

We copy that, Pete. You got the nominal alignment.

That came out.

SIDE screen came out very nice. Okay.

Popped right out. Looks good.

Boy, are you dirty. I'm just as dirty. Don't much want to stay down. Okay. That first shape; I can't believe it.

(Laughter) They've got to be kidding. Yes. Boy, anytime you put anything spring-loaded on the Moon, you're in trouble (laughter). This screen has got sort of - you know - a spring to it?

(Laughter).

Doesn't want to lie down much up here in this gravity.

Okay. Houston, how long we been out?

Pete, you've been out 2 plus 40, and the pacing one right now is Al. You're running around 20 minutes behind. And when you can, we'd like an EMU check, and if you'd give us your O2 readings?

Okay. My O2 reading is 50 percent. And have you got anything for us? Haven't heard too much from you.

Negative on that. You're perking along real well. And we're following your progress. It looks as though you're getting the job done.

Okay. Look - How you doing, Al?

I'm doing good.
Okay.

That little thing just doesn't want to ---

Houston, let me ask you a question. Can I push in the shorting amp thing?

That's affirmative, Pete. We understand you're not able to get a reading. So, go ahead and close it ---

All right. It might ---

And we'll stand by for a zero reading.

-- okay, it might be full-scale high.

Hey, you'd better tell them I still haven't put the SIDE down.

That doesn't make any difference, does it?

I don't know.

It's all connected. It's all connected. Does it make any difference, Houston?

Stand by.

You're a big-area litterbug? You know that?

I know it.

Pete, we'd like you to go ahead and get the full deployment down first before you depress the shorting amps.

Okay. Boy, you're dirty all the way to your knees. Can I give you any help?

Sure could.

All right; here I come.

And, Pete and Al, a comment on picture taking. If you would, try to document some of the dirt which you've - which has gotten over - all over the equipment. If you would, try to get closeups
which will show the dirt we might have on thermally sensitive areas. And, also, when you get done, if you would, take one or two extra pictures showing the ALSEP with the mounds that you described previously in the background. That'll give us a good geometric reference.

04 21 50 21 CDR Okay. I did a PAN -
04 21 50 22 LMP Hold it - Hold that, Pete.
04 21 50 23 CDR I did a PAN out here at the -
04 21 50 29 LMP Okay. Just a second. Now, let me hold this end and you stretch that end out.
04 21 50 33 CDR Okay. I got it.
04 21 50 34 LMP Go to the right. That's it. Get the ... Get the coils out of it.
04 21 50 37 CDR Which way's this thing head?
04 21 50 39 LMP It's got to head away from - central station - away from everything. Probably ought to point right over there.
04 21 50 48 CDR Okay.
04 21 50 49 LMP But, now, I think if you kind of twirled it a couple times, it would end up uncoiling that twist in the line there.
04 21 50 57 CDR That's right. Let me try it that way again.
04 21 51 00 LMP Looks like it might be working. That's good. That's doing good. Okay. Let me take and set this thing down, and it's supposed to point to the Earth this way. That'll be good.
04 21 51 13 CDR Got your ground wires wrapped around the leg.
04 21 51 15 LMP Yes, I know. Got it. Looks like it's going to be okay.
04 21 51 23 CC Yankee Clipper, Houston.
Yankee Clipper, if you'll give PO0 and ACCEPT, we'll ship you up a state vector, a target load, and a REFSMMAT.

Okay. Hold on, hold on. Don't tip over.

Roger.

Now, wait a minute, wait a minute.

Okay.

I got it steadied.

Okay.

There, that's all right.

Just hold it there and twist it.

Watch it, watch it, watch it.

Okay. I'm trying to.

No, your foot's hung in it. That a boy.

That did it. Okay. Let me sneak it back on again. Okay.

Now, what do you want?

I want to put that lid back on there. It would probably be best if we just left it off.

I think it would be best if you left it alone.

Okay. Now, if you hold it there while I --

... I got it. I got it anchored.

-- because this is going to want to turn it over.

Yes. I know.

Yankee Clipper, Houston. We're coming up with a load.
Yes. Step on it.

Okay. That's what I think I can do. No.

They've got to be kidding about that cable. I've been - They knew that thing was going to do that.

There, maybe that's better.

Come on, this thing's making us run behind.

I know it, but I don't see any way to quickly - (Laughter)

All right, now, just a minute. Your foot. That's better.

Okay. Make it turn - Let's try it a couple more times. I think if I hold it this way and use this tool, I can probably set it - -

Hey, it's just like zero g; everything floats up. That baby's going to nose dive into the dirt every time, sure as I'm standing here. That cable's cleverly designed to make it do that.

Let's put it like this. Down like that.

Don't fall over.

Okay. There's no way.

Uh-uh, just - That a boy.

That thing goes right in the dirt each time - -

I know, I know. It's going to do that. It's very frustrating. Turn it around and point it the other way. See if it'll - see if it'll point out that way.

All right. That might be good, too. Okay.

Do - I knew that ding-a-ling cable was going to make us spend hours trying to do that.

(Laughter) Doesn't that make you mad?
Yes. I know - especially when you know it's going to happen.

Look, why can't I set it like this? You just let go of the SIDE and come over and step on that thing.

Hey, if this SIDE falls over, then I'm really going to be mad. I got that thing firmly planted.


I can't. Here - There's no way. Let go of the - let go of the string in your hand. That a boy; now, bend -

It's just --

... That's it. Push it in.

Ah! We made it. I hope. Let's push it real hard in there.

Okay.

I think we've got it licked.

That a boy. Easy does it.

Oh, you - That thing just jumps right up.

(Laughter)

Pete, I'm just afraid that one - We've had it on this one.

We've had it on that one, all right.

Hey, here it is here. Look, I don't think it makes any difference if it - if it lays on its side as long as it points its aperture in the right place.

Yes.
Let's move it around here and just let it lay on its side. Yes, it doesn't know - it doesn't know the difference. Let's just kind of lay it around. Let's turn it - now, that'll be - that'll work; that'll work.

That work right there?

Al, we concur with that. Go ahead.

Okay. It looks like the only way this - this cable has just got too much spring for the - for the - the weight of the package, and there's just no way. Okay, Pete. Let her go. Now, let me level it. No way.

That's a shame. What time is it, anyhow? Let me get over here and get a big picture of this.

Pete, you're 2 plus 48 into the EVA.

Okay. Level this, Pete. That's leveling good. Leveling real good.

That American flag sure looks pretty back here next to the LM, doesn't it? The S-band - looks like a model.

Yes. I think that's going to do it for the SIDE. That was a tough one ...

Back off; I got the picture.

... you got a cross-Sun?

No. Let me get - I'm just getting one from a distance here ...

Al, copy you have the SIDE deployed.

Yes. Everything's deployed. I'm going to go get the shorting plug now, Houston.

Okay. Standing by.

(Humming) Boy, do I like to run up here. This is neat.

Yes. It is fun.
The first thing we've got to do is run over to that volcano-looking - whatever that little jobber-do is. That's interesting. Okay, Houston. Here comes the shorting plug.

Yankee Clipper, Houston. The computer is yours.

... ASTRO switch 1? Hey, Al.

Yes, sir.

I need your help over here after a minute.

I'll be there.

Houston, how about ASTRO switch 1?

You're clear to rotate ASTRO switch 1, Pete.

Okay.

Okay.

Okay.

Okay. Gosh, we can't - We've got to realign that antenna.

Okay, Houston. ASTRO switch 1 is rotated; shorting amp switch is in. I'll be a happy man if you tell me you're getting a signal.

Boy, it's all put up.

Roger, Pete. Stand by.

It sure looks nice.

How about - how about messing with this one thing right here?

Okay. Well, we'll do it, Pete. Let's - let's - I wanted to just look at the numbers with you, too. Hey, would you just do me a favor? Use your tongs and pick up a couple of these Boyd bolts and set them on the edge of that skirt - ... the seismic. There's about 10 Boyd bolts just near it over there. What did you want me to look at?
04 21 59 24 CDR  Just check - check that antenna; make sure it's level.

04 21 59 27 LMP  Okay.

04 21 59 29 CDR  Okay, I'm ... You do that. I'll give you the tongs. I'm going to run over and photograph this ding-a-ling looking -

04 21 59 35 LMP  All right.

04 21 59 38 CDR  Houston, how long you going to let us stay out?

04 21 59 41 CC  Pete and Al, --

04 21 59 42 CDR  Go ahead.

04 21 59 43 CC  Pete and Al, Houston. Looks like you did the job. We're getting data back.

04 21 59 45 CDR  Hey, that's - You don't know how happy I am.

04 21 59 49 LMP  Okay. Tell me again the ... numbers you're supposed to use.

04 21 59 52 CDR  16445.25. Here, turn around.

04 21 59 56 LMP  Okay.

04 21 59 57 CDR  I shouldn't have done that ... dirty all over, here.

04 21 59 59 LMP  Okay.

04 22 00 00 CDR  All right, I'm going over to this mound.

04 22 00 01 LMP  Okay.

04 22 00 02 CDR  I'll be back in a flash. By-by.

04 22 00 04 LMP  Okay. I'll tell you the numbers I read; you tell me if they're right.

04 22 00 07 CDR  Okay.

04 22 00 09 LMP  I read 52 - no, no, correction - I read 525.

04 22 00 15 CDR  That's right.

04 22 00 17 LMP  Okay. I also read - 16 - 42.
I don't know what this thing is. It's really weird.

1642. You ever - Is that - Is that it?

1644, Al.

Okay. Same thing. Looks good, looks good.

I don't know what this is. Let me get the - ... feet at f:8.

Yankee Clipper, Houston. Go ahead.

That's affirmative. We'll be up with you in about 2 minutes.

I know what it is.

What is it?

Well, I think that rock - I think it's - it's just a little secondary impact crater. Very funny ... Boy, is that a funny rock - It looks -

Yankee - Yankee Clipper, Houston. I have the maneuver PAD when you're ready to copy.

Hey, here's a rock they'll be glad to see in Houston.

Good.

It's an interesting one. It looks like a solid glass chunk - -

Oh, yes?

-- shiny black material, I've never seen anything like it before.

***lunar orbit plane change 1, SPS/G&N: 36733; minus 0.73, plus 0.51; 119:47:12.54; minus 0011.5, plus 0349.6, minus all balls; roll, pitch, and yaw, all zeros; 0062.5, plus 0057.3; 0349.7, 0:18, 0337.1; 05, 002.6, 18.7.

Dick, for boresight, Draco Beta.
And that's down, 007; right, 46. The remainder is NA.

Hey, Pete, let me put this rock in your pack.

Sirius and Rigel.

-- glass spatter on it. That's fantastic. Never seen anything like that rock.

For your alignments, 047, --

No, I haven't. No, I haven't.

That's great.

-- 263 --

... go.

-- 055 --

-- And that's two-jet ullage --

-- for 15 seconds. Read back.

Hey, are you - are you through, Al?

Yes. I - I got - I got some pictures to take and that's it.

Well, you take some pictures, and I'll meet you over at that big mound. All right?

All right. Sounds good.

All right.

Clipper, go ahead.

Going to bring the tongs, Al.

Okay. Unless you want them, right now.

Okay, Clipper. Understand. You did not copy all of that PAD. Is that affirm?
Okay. Boy, is that a big rock!
Okay, Al. What are you up to?
I'm coming your way. Let's start sampling.
Okay.
I'll be there in a minute.
Houston, how long you going to let us stay out?
Hello. Hello, Houston?
Al, Houston. Go ahead.
Okay. How long you going to let us stay out?
Pete, you'll be extended 30 minutes; so, you're out for a total of 4 hours.
All right, how much do we have?
And it looks as though you're - Okay. You've got about 1 hour left, and it looks as though we're going to have to close off pretty much with the nominal plan; and stand by; we have some words on the traverse back.
Okay. We're standing over at the head crater.
Why don't we start picking up some rocks, Pete, while we wait? Yes?
Yes. Yes. Yes.
Want to get a picture of that?
Sure do.
Let me get it set up.
Right.
... and f:8. Okay. There you go. Okay. Grab her up, Pete.
Pete and Al, two things we'd like you to do on the traverse on the way back: One is to get samples and some documentation of those mounds; and secondly, if you can, get over to the 1000-foot crater, which is northwest of the ALSEP, and get samples and documentation of that sample from there.

1000-foot crater?

Suppose that's where we are? Is that one - that one over there?

You don't mean the head crater, do you? Let's get some of this mound Al.

Okay.

It's an interesting thing. There's a little vent hole.

Negative. We'll - If you're at head crater now, we'll give you - we'll give you a radar vector. Stand by.

... this way. You're - you've already got pictures of the - this, Pete?

Yes, at 15 feet. I'm just taking it close up over here.

Okay. Take that at about -

Go get the - Look at this black rock, here.


I got it; I got it; I got it.

Yes, but I didn't get a picture of it. Okay.

Of that one? Yes. Okay?

There, you old picture in there. Let's get another one from right here ... this one -
Let's go around to the other side and not kick any dirt on it. It ruins it.

Yes. Okay; go ahead.

Go.

Pete, Houston. The crater which we speak of is - Pete, the crater which we speak of is about 300 feet northwest of head crater.

The head - Oh - I see it. Yes. You mean the great big one over here? Okay. Yes. We can go over there.

That's affirmative.

We can go over these, but that's the - -

Wait, wait, wait a minute.

Huh?

Try a piece of that.

And, Pete and Al, we'll be - talking with Yankee Clipper, giving him a maneuver PAD, for about the next 5 minutes.

Very good.

Let me see if I can chip some of that off, Pete, with this. Get my tool here. I know - You could work 6 or 7 hours here; never bother you a bit - a bit ...

Right. Okay.

I'm going to knock a piece of that off.

(Humming) You know, I've got the feeling that when that crater was made, it just threw out a big blob of dirt. This is where it landed.

Ain't any that big.

CONFIDENTIAL
Hey, you'd almost - I wouldn't be surprised to find this is that microbreccia; you haven't got any - -

Hey, let me get a picture. Let me get a picture of that one.

Okay. That'll be a goodie.

Pete and Al, Houston.

Go.

Go ahead.

We're trying to get a maneuver PAD up to Clipper; he's having a hard time copying it with you talking in the background. Could you - could we have some silence for about - -

Okay.

-- For about 5 minutes, while we get that PAD up? Okay. We'll be right back with you.

Pete and Al, we're back with you.

Okay.

Roger-Roger. We're almost over to the 1000-foot crater.

Roger.

Got - got about another 200 feet to go. You can see these linear patterns quite frequently on the surface, Houston. They are - seem to generally run from the north to the south, and they're just little lines. They're off in the dirt; sometimes you see a large area - We're in an area right now. It looks like it had a fresh impact not too long ago.

Let me take a picture of this one, Pete. This - -

Hey, I got some neat - neat ones right here.
Okay. Looks like a secondary impact crater that occurred - recently.

Yes. Some of them do, don't they?

They do. This one looks like fresh - doesn't have that old look like all the rest of these - -

Come on. Let's go.

There's some of that ... in the bottom of there.

Roger, Pete and Al. We copy that. We show you're 3 hours and 7 minutes into it - into the EVA. And we'd like you back to the LM to start the closeout in 10 minutes. That's at 3 plus 17.

Okay.

Holy Christmas, we're going to have to smoke there, Houston.

Well, we're there, now.

Yes. We're almost to the crater.

That's affirmative.

Okay, we'll - we're not getting very many rocks by going this far, but if that's what you want, that's what you want. Run, baby (laughter).

Hey, let's - When we start picking up, let's try and get a larger sample - -

Hey, look at - This looks like a brilliant spanking fresh impact crater. Look at that little fellow, huh?

Sure does, doesn't he?

Yes. Let's get some rocks right here; here's some. Here, get some pictures first. Get some pictures of that crater, and I'll get some over there. I'll get this one right here.
Okay. Wonder why these look so fresh? Must be just the difference in materials.

Boy, it sure does look fresh though, doesn't it?

There - there's a rock for you.

Okay.

Listen, we need to find a grapefruit, too, you know.

Yes. There's a bunch around.

Made a dent on this rock. Whoops. Wait a minute; I dropped it. Hold it; move on a little bit. Move on; move forward.

Okay.

Don't like hustling. I'll be dopped! Let's go.

Okay.

Get right to the edge of this crater and photograph it. Get a PAN in it, and then we won't have to come back this way. Look at there; that crater's spectacular, isn't it? Wow, a monster! Look at that rock! I'd like to -

Oh ... get some of this bedrock --

Well, we may want to go back there tomorrow, but we can't go any further. We'll never get back in 10 minutes.

Hey, there's bedrock down here, a little ways.

Where?

It's right down the hill.

Hey, you're right.

About 50 - 50 yards.

Here I go.
Hey, good show.

You're right. I'll PAN it first. Got just a minute. I'm going to get in here and - You get to go to intermediate cooling.

Okay.

Been around here so far on MIN.

Yes, let's ... -

Look at - don't - don't - don't they look like something looking into zero phase? Look at those --

Yes.

-- fresh little jobber-do's. Now, wait a minute. I want to --

Why don't you go ahead and PAN - right here?

And I want to get to 74.

Okay.

74 --

You ought to have two f:8.

8, right?

50, and you're looking - right there.

And you ought to have 8 over there, and 11 right there, and 8 over there.

Yes.

1, 2, 3 --

Beautiful.

-- 4 --

You can - better believe it -
04 22 18 21 CDR
-- 5. Now, let me go back to f:ll.

04 22 18 25 LMP
Okay.

04 22 18 26 CDR
We'll have to smoke to get back to that LM. We're a long way. Look where we are. Oh, we can make it; no strain.

04 22 18 33 CDR
Huh?

04 22 18 35 LMP
Got it. I was just looking over this rock, down here. Looks like it came --

04 22 18 39 CDR
Just a minute.

04 22 18 40 LMP
Okay. Now, let me go over here, and I'll get one in stereo of this baby.

04 22 18 45 CDR
Okay.

04 22 18 46 LMP
Let me just leap over here a ways.

04 22 18 48 CDR
Houston, we're looking down into this big crater now, and it looks rather old. ...

04 22 18 51 LMP
Hey, there's some bedrock on the bottom, I think, here. Looks like big boulders.

04 22 18 55 CDR
There's some big boulders that are resting inside the rim. None on the rim like we see on a large crater that's further to the west by another 1000 feet. But you don't see any outcroppings of rocks either that - you know - that we could look down and say, well, from the top of the rim down to about 20 feet or something, then we come to the - the underlying rock, but there is this rock that's very large, an arm's spread around. We're going to try to collect some of the samples.

04 22 19 29 CDR
Hey, I'm going to get the --

04 22 19 31 LMP
We can get them here --

04 22 19 34 CC
Roger, Al. We suggest that you hustle. We show you're 3 hours - 3 hours and 11 minutes, and we'd like you back there around 17 - 6 more minutes.
We're picking up a couple right now, and we're on our way back. Just a minute.

Boy, there's a big block over there.

I can't get it?

You got it?

I can't get it with the tongs.

Hold my hand, and I'll pick it up.

Hey, wait a minute. How about this?

Get it?

Push it over here, and I'll get it.

Push her over here.

Okay ...

Drop it in my bag.

Okay. You got anything else you want to put in your bag? Got to push another one over here.

Okay, in just a minute.

Okay.

A couple of big ones. Oh, I wish - Get this inside of that. I can't.

Try that one.

That's a good one.

Huh?

A couple of nice ones right here. Wait a minute. Get my hand here.

There you go. Oops.

Okay. Wait a minute. Yes. Let's just - let's just get - get this real good one.
Okay. We're getting you some of this rock, Houston; I hope it's a sufficient. Let's go back and pick up another kind. Where the heck is the LM?

Roger, Pete and Al. We copy. We suggest you start smoking on back there. You're 3:13, and I'd like you back there in 4 minutes.

Okay. We're on our way. Let's go, Al.

Hey, Pete?

Yes.

Let me ask you something.

What?

What -

Huh?

That's interesting, isn't it?

When?

I was looking at that rock perched right over on top of the hill, there.... my distance here, because there's nothing but -

Here.

-- all the same.

Yes.

... the same.

Must have been 1200 - 1300 feet, huh?

At least.

At least. You could travel a lot further than that; you know it?
04 22 21 52 CDR   Yes.
04 22 21 53 LMP   You could really make a long traverse if you had a good long-term OPS.
04 22 21 56 CDR   What do you figure my strides are - 10 feet?
04 22 22 00 LMP   No. I'd say your - each step only goes about - When you're running normal, I'd say they'd go about 3 or 4 feet, but you could just go indefinitely at this pace.
04 22 22 09 CDR   Yes.
04 22 22 10 LMP   You don't get tired. Seems that you land flat-footed and then you just push off your toes and - then you go.
04 22 22 22 CDR   (Laughter)
04 22 22 23 LMP   Fun! Well, we got that ALSEP up.
04 22 22 31 CDR   Listen. When I get this rock box, we've got to get some more rocks. Turned us all around, and we didn't get any rocks.
04 22 22 42 LMP   I'm getting some up here.
04 22 22 44 CDR   We'll fill it. Just a minute.
04 22 22 51 CDR   Hey, Houston. We're approaching the ALSEP, headed back to the LM.
04 22 23 01 CC    Roger, Pete. We copy.
04 22 23 03 CDR   If you hadn't made me run all the way -
04 22 23 05 LMP   Who, me?
04 22 23 06 CDR   Yes.
04 22 23 07 LMP   Hey, ease over this way a little.
04 22 23 08 CDR   Which way?
04 22 23 09 LMP   Over towards your left.
04 22 23 10  CDR  What you want to do?
04 22 23 12  LMP  I thought there were a couple of good rocks over there. There.
04 22 23 19  CDR  Be about halfway -
04 22 23 21  LMP  Why don't we grab a couple of rocks here?
04 22 23 24  CDR  All right. Here's one right here.
04 22 23 25  LMP  Okay. Let me get a photograph of it. Hurry. We're on the way.
04 22 23 31  CDR  Coming?
04 22 23 36  LMP  Okay. There's a good one. Wait a minute. 8. Step in and get the picture.
04 22 23 46  CDR  Got it?
04 22 23 47  LMP  Got it. There you go.
04 22 23 51  CDR  Good boy. Okay.
04 22 24 06  LMP  Get another good one. Forget the picture.
04 22 24 09  CDR  Okay. You're in the shadow. Step back just a little.
04 22 24 12  LMP  I said forget the picture. --
04 22 24 13  CDR  Okay.
04 22 24 15  LMP  That's a good one. That's a heavy son of a gun.
04 22 24 19  CC  Pete and Al, we're picking up your heavy footprints going by the seismometer.
04 22 24 22  CDR  That's great.
04 22 24 23  LMP  Hey, Pete.
04 22 24 24  CDR  Yes.
04 22 24 25  LMP  Let's get one last shot of this thing.
You - Look, I got to get going on the rock box. I can't -

Oh, okay ...

Go ahead and get one more. Zing. I feel like Ebeneezer Scrooge or something whistling across the plain.

Boy, there's a lot of soft land here.

Okay. We're within about 300 feet of the LM now, Houston. Coming on at a full gallop.

Roger, Pete. We copy.

There's a good rock.

Halt, halt, halt!

Look at that!

I swear there's a --

Never saw one like that before. Look at that!

Okay.

That green? What is it?

-- see it.

No, it was grinning at me. That's why I stopped.

Okay.

The heck with it. Put it in the rock bag.

Let's go.

Yes, sir.

Okey-doke.

(Laughter)

Here, let's pick up a couple of these.
04 22 25 30 CDR  Okay.
04 22 25 34 LMP  Hey, they're good. They're a little different. They're more the gabbro type. Yes - wait a second. Wait a second.
04 22 25 57 CDR  Get it in?
04 22 25 59 LMP  Good show.
04 22 26 00 CDR/LMP  Let's go.
04 22 26 03 CDR  What I'd hate to see is an LMP laying on the lunar surface. Hey, what's that glass! Look at that! Son of a gun. I got to have that. Look at that, a pure bead of glass! Hey, that's -
04 22 26 16 LMP  Let's grab it. Oh, come on. Hold my hand.
04 22 26 22 CDR  Okay.
04 22 26 29 LMP  Oh, I'm losing it.
04 22 26 42 LMP  Got it.
04 22 26 43 CDR  Pure glass or something, huh?
04 22 26 44 LMP  It's one of those black beads, only this one's --
04 22 26 45 CDR  Careful.
04 22 26 46 LMP  -- about --
04 22 26 47 CDR  All look green to me. Okay.
04 22 26 50 LMP  -- three-eighths of an inch in diameter. And they're all --
04 22 26 54 CDR  ... Intrepid. Okay. What do I got to do here?
04 22 27 07 LMP  Okay. --
04 22 27 09 CDR  Okay. I'll tell you something you can do.
04 22 27 11 LMP  Okay.
Take the PAN photographs again. I took them at 15 feet, I think, by mistake.

Okay.

And I'll get the rock box out.

All right. Real good.

Hey, Houston. We're back at the LM.

Roger, Al, Pete. We copy. After you get finished with the core tube, Al, we'll have some instructions for you with the TV.

Sounds good. Okay, Pete. Where are the tongs for a moment?

The tongs are on the MESA.

Okay.

They are?

I have them now. Now, which PAN's do you want me to take? Over here?

No, about - Yes. Front and over on left and rear.

Fifteen, 12 each or -

Yes, take 15.

Okay. Will do. I'll take them again. I'm going to take a few PAN's first, Houston, if that's okay. It'll take about an additional 3 minutes.

Hey, Al.
Yes, sir.

Never mind. Wait a minute. I think I'm getting it. Now, I got it.

Okay. Okay.

One camera in the ETB.

That Surveyor sure looks neat sitting on the side of that crater.

Pretty steep walls down there.

I'm not going to have any trouble sleeping tonight.

Okay. Okay, let me just get the other two PAN's, Pete. Be finished in a minute.

Okay. Okay, stow 70-millimeter, the hammer - Okay, stuff that handle. I'm getting it right now. Good Godfrey. Okay, SRC number 1 coming up.

... PAN's. Get on a higher place.

Say again?

Oh, I was too low for the PAN's. Okay, this is a good spot, I think. Okay. That's it for the PAN's, Pete.

Okay. One rock box open.

Okay, one more set to go.

Okay.

I've got this bag of rocks on me, here. Want me to bring them to you in a minute?
Yes. I'm having trouble over here with the rock box holders.

Okay. If you have a little trouble, I can help you with it.

Yes. Yes. This rock box keeps wanting to go up in the air. Oh, the heck with it. I think I'll put them in there.

On the scale.

Got to get this core tube, buddy.

I know it.

-- as fast as I can.

Just great.

Okay, all the PAN's are done, Pete. Okay?

Come get the core tube.

Okay. It's in work. Okay. Here's this. Put this back.

Throw it in the handtool carrier.

Yes sir. I'm just going to lay it in there. I'm not going to --

Yes.

-- fit it in there now, so we can get finished.

Okay. Here, hang those on there, too.

Good. You want it hung on there, Pete.

Okay.
You bet. You bet. Got it. Okay. Let me go get that core tube.

Here's your core tube, right here.

Just a second.

Okay.

Okay. Here is the core tube.

And I've got the cap back here --

Pete and Al, you're 3 plus 26 into the EVA. And, Al, we'd like you to hustle. We'd like you back there at the bottom of the ladder in 3 minutes.

I'll hustle. I'll hustle.

Let me get your rock bag before you get away.

Okay, get that rock bag. I'll go get this core tube. I think I can make it in 3 minutes.

All right, wait just a minute.

If they'd give me 2 minutes, I'd go over and do their TV. Maybe they ... the TV, too.

Yes.

Got that?

Yes.

Got the bag?

Yes.

Adiós. I'll go for the core tube. I'll go for the core tube over near the TV, and I'd come back by it.

There you go. There you're thinking.

I sure wish we had more rocks.
Okay, Al, good idea.

Say again?

I wish we had more rocks.

Okay, I'm core tubing it, right now.

You know, I wish we had more rocks.

Pete, you can go ahead and fill up the remainder with the fines from that area.

Okay. I'll have to wait for Al to come back anyhow. Let me see; is there something I could be doing all this time? Yes, one thing is shut down my water. Good Lord, I'm floating to death again. Let's see. Scoop material. That a boy.

Houston, we're getting the core tube in real good. It's down almost full length now.

That a boy, Al.

It's a little hard to drive in; you have to auger it a bit and then pound it, but now it's full length, and let me take a - a picture of it and that will be it. Okay 250, 8.

Roger, Al. Sounds like you've got the lunar core tube technique worked out.

I got the record for core tube depth, right now.

(Laughter)

-- in my pocket.

(Laughter) good show (laughter).

Copy your record of core tube depth, and you've probably got the record for swinging pieces of ALSEP across the lunar landscape.

And would you believe, I've found a use for the big scoop.

Okay, here comes the core tube.
Okay.  
Got the cap ready, Pete?  
Yes.  
This stuff comes right out, doesn't it? That's all right.  
Okay.  
I'll bring it right back.  
Just a minute, I --  
Houston, I'm coming right by the TV camera. Did you want me to do anything to it?  
That's affirmative, Al.  
Okay.  
First, we'd like to take and put the automatic light control switch to INSIDE --  
All right; will do.  
-- then, open the aperture in steps and leave it at 10 seconds at each step.  
Okay. It's now on INSIDE. Okay, now, I'm going to the aperture. Looking almost directly cross-Sun, by the way, Houston.  
Roger. Call it out if you would, Al, while you're doing it.  
All right; f:22. Okay, I'm in f:22 right now. I'll stay right there for about 10 seconds. Okay, going to the next one. There's not a lot of them marked on here, Houston; there's only about three marks; I'll just move it a little touch. Okay. I moved it just a little bit, and I'll leave it there for 10 seconds. Now, I'll tell you when I come to the next marked one. Okay, moving again.  
Houston, rock box 2's going onto the Y-pad with the Mylar or whatever you - film or whatever you call that stuff off the S-band antenna, going on top of it.
Okay, and it's in 5.6 now, Houston. It's been there for about 5 seconds.

Roger, Al; we copy. And, Pete, we copy you got the rock box over there with the H-film from the S-band.

Yes. Okay, it's now a little past 5.6, opened up a little more. I'll bring you that core tube in a minute, Pete.

Now, I'm just looking for things to do. I got a whole bagful of soil, and rock box 2 out. Man, does that LM look pretty! Does that Surveyor look pretty!

Okay. I'm turning it again, Houston.

Okay. Now, it's just a little bit above 2.2.

Roger.

Okay. Now, it's going to be wide open on the next move, which is right now. Okay. It's wide open, Houston.

Standing by for some more instructions, Houston.

Okay, Al. Would you do one other thing, then? Pick the camera up and invert it. Maybe give it a shake or two and see if we can get anything.

Will do. It's upside down and I'm shaking it now. I still am a little concerned about this plug on the back of the camera; it looks - doesn't look exactly copacetic. It looks like it's cracked a little bit, - the ... material, and it looks like it could have melted or something. There might be a problem right in the wiring there. Okay, I've shaken it and what have you. I'll hold it upside down just for a few minutes. I can feel the motor running.

Okay. And, Al, why don't you try moving that wire on the back and see if that will do anything?

Okay. I'll try to hold it in for 10 or 15 seconds.
Okay. I'm holding it in now.

Al, I think we've run out of ideas here for the present time. Let's press on. Will you take the camera over and put it in the LM shade, point it at a darkspot, the darkest spot you can find, and open the camera way up, f:2.2?

Okay. Will do. Let's go with the core tube.

Okey-doke.

Okay, babe. Here you are. Take this hammer and core tube if you would; both of them in my hand here. Let me set the camera down, then I'll help you. Hold on.

That a boy.

Camera right there.

What a shame that camera didn't work.

That's right. Take - put that somewhere. Just drop it right in this baby right here.

Okay.

Okay, Pete. Does it look like the dirt's in there?

Yes, sir. It looks like the dirt is in there.

Good. Put the cap on that tube. You got it on unlock here.

Okay. Unlock.

That's it. That core tube's in the bag - Wait a minute. Give me my - give me my rocks off of here, will you?

Sure will.

We've got a whole bagful of dirt there.

Okay.
<table>
<thead>
<tr>
<th>Time</th>
<th>PI</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 22 42 15</td>
<td>LMP</td>
<td>Here's a rock.</td>
</tr>
<tr>
<td>04 22 42 16</td>
<td>CDR</td>
<td>What'd we do with it? No, no, no, just give me the bag, the whole bag.</td>
</tr>
<tr>
<td>04 22 42 19</td>
<td>LMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>04 22 42 20</td>
<td>CDR</td>
<td>Do we want to save that bit?</td>
</tr>
<tr>
<td>04 22 42 23</td>
<td>CDR</td>
<td>Yes. Let's throw that bit in the box.</td>
</tr>
<tr>
<td>04 22 42 25</td>
<td>LMP</td>
<td>Okay, I will. Let me have it.</td>
</tr>
<tr>
<td>04 22 42 28</td>
<td>LMP</td>
<td>Here you go. No, no, not there. Here - You've got it.</td>
</tr>
<tr>
<td>04 22 42 31</td>
<td>CDR</td>
<td>All right. Hey, that's a couple of neat-o rocks.</td>
</tr>
<tr>
<td>04 22 42 36</td>
<td>LMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>04 22 42 43</td>
<td>CC</td>
<td>Pete and Al, Houston. We show you are 3 plus 35 into the EVA. And you've got plenty of consumables, so we suggest you go at a relaxed hustle to get back in.</td>
</tr>
<tr>
<td>04 22 42 54</td>
<td>LMP</td>
<td>Okay. It's almost all done. Think we've got it made.</td>
</tr>
<tr>
<td>04 22 42 58</td>
<td>CDR</td>
<td>Hey, Al. I got to dump some of this dirt. Come here, Al.</td>
</tr>
<tr>
<td>04 22 43 01</td>
<td>LMP</td>
<td>Just a second, let me move this TV.</td>
</tr>
<tr>
<td>04 22 43 05</td>
<td>CDR</td>
<td>Okay, forget it.</td>
</tr>
<tr>
<td>04 22 43 06</td>
<td>LMP</td>
<td>There you go. It's wide open, now, in the dark. Okay, Houston; it's wide open in the dark.</td>
</tr>
<tr>
<td>04 22 43 20</td>
<td>CC</td>
<td>Okay, Al.</td>
</tr>
<tr>
<td>04 22 43 25</td>
<td>LMP</td>
<td>I feel like the guy in the shopping center waiting for his wife.</td>
</tr>
<tr>
<td>04 22 43 30</td>
<td>CDR</td>
<td>Okay?</td>
</tr>
<tr>
<td>04 22 43 31</td>
<td>LMP</td>
<td>I'm standing here holding two bags, buddy.</td>
</tr>
</tbody>
</table>
I'm coming - coming (laughter).

Look out for the S-band; don't get tangled up in the LEC.

Okay, what I want you to do - No, no, no - Dump some dirt in this bag.

Dump some dirt in that bag.

Yes, yes, that a boy.

How much? When you say stop?

Well, let's just keep on going for a little bit.

Okay.

All right, let me look. All right. Boy, that's dirt.

That's dirt, you better believe it. They're not going to grow many roses here, but - -

Now, that's good; that's plenty. Hold it. All right. Now, let me shake her all down. That's a good bagful.

Do you want me to just - What do you want me to do with this, Pete?

Wait a minute. Yes. I may need some help from you.

Okay. Want me to help close that box?

Yes.

Okay.

Get it in here.

All right.

I'll just set this here because we can always get it when we need it. Put it right there.
04 22 44 33 CDR  Now, hang onto the box while I stuff it.
04 22 44 35 LMP  Okay.
04 22 44 36 CDR  ... me to make sure I don't grab the seal.
04 22 44 39 LMP  Okay. Go. Hey, you're right, that thing doesn't want to stuff, does it? Kind of - kind of flimsy. They better start making this lunar equipment a little more sturdy.
04 22 44 56 CDR  These bags are all breaking open, too.
04 22 44 58 LMP  That's ALSEP...
04 22 45 00 CDR  And there's a rock box that's full of rocks.
04 22 45 05 LMP  Okay. That looks good, Pete. Could we - put it in any other way? Better put it in the middle - It's going to be right on that seal. There, it's in there okay. That'll do it.
04 22 45 17 CDR  Got a ... have the room.
04 22 45 20 LMP  It closed; don't you worry.
04 22 45 21 CDR  Okay. Is that it?
04 22 45 22 LMP  Wait a minute. Looks good; you've got a good - good full box.
04 22 45 28 CDR  Okay. Close the door. Watch your handle there; watch your handle.
04 22 45 33 LMP  Wait a minute.
04 22 45 34 CDR  Okay? ...
04 22 45 37 LMP  You've got it, babe.
04 22 45 38 CDR  Now, just hold. Hang onto the box. Go. Watch it; I don't want to break the table.
04 22 45 42 LMP  That's what I was thinking. Hey, that's good.
04 22 45 45 CDR  Lock that latch.
04 22 45 49 IMP  Go to it!
04 22 45 50 CDR  I got it!
04 22 45 51 LMP  The other one. All right.
04 22 45 52 CDR  Hot-diggety dog. Okey-doke. All right, now. Put your camera in the ETB.
04 22 45 56 IMP  All right. I'm not sure I didn't use up all my pictures today. That's a good idea.
04 22 46 00 CDR  I don't know how many I took; I wasted ... 36 on there ... or so - wait a minute --
04 22 46 06 LMP  No, 140.
04 22 46 08 CDR  Okay ... Let's see; we've sealed the organic thing, removed the saddlebags; we scooped material; we stowed the SRC; we stowed the core tube; we closed the SRC; we got an EMU check, COMM check - Hello, Houston. How do you read? ... bolt on.
04 22 46 28 CC  Loud and clear.
04 22 46 29 CDR  Okay. How much time have we got, Houston?
04 22 46 31 LMP  Hold that bag - just a minute, Pete.
04 22 46 38 CC  Pete, we show that you're 3 plus 38 into the EVA, and you've got a fair amount of consumables; so don't - don't rush too hard getting back in - Just do what you have to, and do it at a safe pace.
04 22 46 50 CDR  Okay. Sounds good.
04 22 46 52 IMP  You going to leave your - There we go.
04 22 46 57 CDR  Frustrating, doesn't it?
04 22 46 58 LMP  Okay. It is frustrating.
04 22 47 00 MS  ...
04 22 47 02 LMP Hold it up just a little bit, Pete. Lift it up just a little ... better there. There you go.

04 22 47 10 CC Pete, will you confirm that you have the stereocamera over in the Sun?

04 22 47 15 LMP Is your stereocamera in the Sun, Pete?

04 22 47 17 CDR No, just a second.

04 22 47 18 LMP Okay.

04 22 47 19 CDR I want to see that first.

04 22 47 21 LMP Okay.

04 22 47 26 CDR Stereocamera going into the Sun.

04 22 47 28 LMP ... clean the EMU and check Commander ingress ...?

04 22 47 30 CDR It'll do. I've got to take this tool off. ... camera. Okay. ... over on the Y-pad, next to my handy-dandy rock box 2, which is neatly covered. You want it sitting in the sunshine, is that correct, Houston?

04 22 47 49 LMP Watch that cable, Pete; you're bothering your S-band.

04 22 47 52 CC That's affirmative, Pete.

04 22 47 53 CDR Did I hit it?

04 22 47 54 LMP Yes. You clipped your left foot on it.

04 22 47 56 CDR Did I - ruin the S-band?

04 22 47 57 LMP I don't think so, but you ought to check it before you go in.

04 22 48 00 CDR Okay.

04 22 48 01 LMP Don't think you did, but the danger is great.

04 22 48 04 CDR ... all over the camera.
There you go.

Why don't you walk around and check it? (Laughter)

Damn you! Getting in a hurry.

(Humming)

Hey, Al.

Yes, I'm coming.

Oh, okay.

I don't like to come across that area; that S-band line is too tender.

Okay. Get that.

Thank you.

That's good.

Okay.

That's a pretty good idea, putting that foil over there.

Hey. Al, let me check the S-band.

Okay.

And then, we ought to dust each other off and get in.

Man, we are filthy!

We need a brush, a whisk broom.

Okay. S-band antenna, lunar stay; would you - I'll get in there and try that?

Okay, all I got to do is get in, soon as we dust off.

Okay. We're looking at the Earth.
04 22 49 25 CC Roger, Pete.

04 22 49 27 CDR Yes, go ahead. Okay, dust me off; and I’ll dust you and get in.

04 22 49 33 LMP I don’t know what good you’re going to do.

04 22 49 35 CDR Hey, it does dust off a little bit.

04 22 49 36 LMP Does it?

04 22 49 37 CDR Stand still.

04 22 49 38 LMP Okay.

04 22 49 39 CDR Very good.

04 22 49 40 LMP Yes, I guess it does. Get some of that loose stuff.

04 22 49 47 CDR Hey, come over here by the ladder where --

04 22 49 49 LMP It’s going to be dark over here --

04 22 49 50 CDR -- No, I can see. Let me - just come over here by the ladder.

04 22 49 53 LMP Okay.

04 22 49 54 CDR There you go.

04 22 50 00 LMP Oh, I see why; you can get lower that way.

04 22 50 01 CDR Yes.

04 22 50 02 LMP Good idea. Good idea.

04 22 50 12 CDR Kick your boots real hard when you --

04 22 50 14 LMP Okay.

04 22 50 15 CDR Okay, now turn around this leg this way - other way.

04 22 50 18 LMP I can crawl up the ladder halfway if you’ll get my upper. I can be going up the ladder, and you can knock it off.
There you go. That's a good idea; go ahead and do that.

See anything else above me - or behind?

No. Just go ahead and start up the ladder.

Okay.

... - Apollo 12.

There you go. You didn't quite make it.

Oh, yes, I did.

Stay put.

Okay.

Let me get these - wait a minute, wait, wait.

Al, would you give us a mark when you're on the footpad?

Roger. I'm off the footpad right now; I'm standing on the ladder. Pete's dusting my boots off, trying to keep some of this dust out of the LM.

Oh, man, is it dusty. Just hold still for a while. Let me try to - Wait - wait - wait just a couple; man, but let me brush.

Roger, Al. Thanks.

Man, you can get rid of a lot of it, kicking that way, -

Okay.

- - ... get it out of your soles of your boots.

Okay; go ahead on up.

Oh, okay.
Day 5

04 22 51 20 CDR
Oh - I'm in this dingy television wire again. There we go. All right, I'll help you - back here as best I can.

04 22 51 36 LMP
That's a good idea. I'm going to raise my gold visor here so I won't scratch it, and just put my protective visor down. There.

04 22 51 46 CDR
Now. Soon as you can see the hatch - When you come up, take a good look at that hatch.

04 22 51 51 LMP
I'm really going to have to be tender about it; I'm not sure we're not going to want to put some tape over it or something.

04 22 51 59 CDR
Okay. All the way down. Hey, raise your rear end. That a boy. Got her.

04 22 52 13 LMP
That's as far as I can go; I'll just do a pushup. Slide in some more.

04 22 52 18 LMP
I'm in.

04 22 52 19 CDR
Very good.

04 22 52 20 LMP
I'm in the hatch, Houston.

04 22 52 25 CC
Roger, Al. Copy. You're in.

04 22 52 27 CDR
Okay, your old friendly third will get the ETB.

04 22 52 30 LMP
Okay, just a second. Let me get my gear. Okay. Just a second.

04 22 52 41 CDR
An ETB and two cameras ready to come up. Oh, there's my friend again. Al Bean?

04 22 52 51 LMP
What?

04 22 52 53 CDR
That thing's going to drive me buggy. Guess what.

04 22 52 59 LMP
Houston, do you want me to switch over to LUNAR STAY antenna - -

04 22 53 04 CC
Go ahead, Pete.
04 22 53 05 LMP  -- Do you want me to switch to LUNAR STAY antenna right now, while Pete's on the surface? Over.

04 22 53 14 CC  Roger. That's affirmative, and TRACK MODE, OFF.

04 22 53 15 LMP  Okay. I'm going to LUNAR STAY right now, but we may lose COMM for a second; if I don't hear from you, I'll come back up.

04 22 53 25 LMP  STAY.

04 22 53 26 CC  Roger.

04 22 53 41 LMP  Houston, Apollo 12. How do you hear on LUNAR STAY?

04 22 53 47 LMP  ... start this ETB up.

04 22 53 48 CC  Intrepid, you're loud and clear. Sounds like Pete did the job.

04 22 53 50 LMP  Sure did. Got good signal strength, Houston? Go ahead and start the ETB up. I got - I'm going TRACK MODE to OFF.

04 22 54 01 LMP  Now, just a second, Pete, I haven't got this ETB rigged. One second.

04 22 54 04 CC  Roger.

04 22 54 06 CDR  Okay.

04 22 54 21 CC  Intrepid, signal strength is good.

04 22 54 22 LMP  Okay.

04 22 54 23 CDR  Matter of fact, you sound stronger, Houston.

04 22 54 25 LMP  Just a second, Pete.

04 22 54 26 CDR  Okay.

04 22 54 31 CDR  Need to mount it.

04 22 54 32 CC  I believe so, Pete.

04 22 54 33 LMP  Got it. We've got it. Wait a second; let me clear a nice little room here for it.
Day 5

04 22 54 44  LMP  Say, are we going to jettison this garbage bag at the end of this EVA, Pete?
04 22 54 46  CDR  Yes, sir.
04 22 54 47  LMP  Okay, let me get it in good position.
04 22 54 49  CDR  Why don't you throw it out right now?
04 22 54 50  LMP  That's a good idea.
04 22 54 52  CDR  Go on and get rid of it.
04 22 54 54  LMP  That's a good idea; you can move it out of the way.
04 22 54 56  CDR  That's a smart one.
04 22 55 04  LMP  Okay, here it comes.
04 22 55 13  LMP  Just a second.
04 22 55 14  CDR  Okay.
04 22 55 15  LMP  Just a second.
04 22 55 20  CDR  Don't worry about it. Is that okay?
04 22 55 22  LMP  Sure. It won't bother us. Get it when you come up. Haul her up.
04 22 55 27  CDR  Okay. Just a second.
04 22 55 32  LMP  Let me try something that might be just easier on all of us. I don't have to run one over a pulley; I can just pull it up, Pete.
04 22 55 39  CDR  It doesn't weigh anything.
04 22 55 40  LMP  That's right. Who needs a pulley? This is easier this way.
04 22 55 42  CDR  Wait a minute. Go ahead, pull. 1, 2, 3. That a boy.
04 22 55 51  LMP  Hey, I got an idea. Now, you pull it - you pull.
04 22 56 03  CDR  Wait - wait a minute. Now, it's making a mess. Never mind. Keep on pulling.
Okay. Okay, just a second.

All right.

I got my transfer bag in. Secured.

Okay, bring her on back, Pete.

Okay. Wait, wait. Don't let it get hung up. Coming.

Let her go.

No, wait a minute, now. Just keep it taut.

Okay.

See, you can't do it that way, Al. Take it easy. Let's do that slow. That a boy. That a boy. Now, now, you can let go of it.

Here is that. We got one rock box coming up. Okay, Al. Easy does it; easy does it. Wait a minute, now. Easy does it. Easy, easy! Easy! Easy! You're pulling when I don't want you to pull. Okay, now pull. Okay, now we got to give it the heave-ho, ready? 1, 2, pull.

Got it made. Okay, lift her up a little bit, Pete. Let it come forward.

That baby is heavy.

That's right in the door, though. Let me slide that in here.

Okay. Okay, Houston. One rock box inside.

Roger, Pete. Copy. One SRC in.

Okay, bring her out.

Okay. Wait, wait, wait, wait, wait! This thing is like playing with a snake. Okay, that's a boy. Now. Easy does it. Get all this good stuff and put it over here in the gear pad. Okay, now, down. Now, you're going to hang on to it.
and hand it to me, right? So I can tie it on the porch?

04 22 59 36 LMP Yes. That's right.

04 22 59 37 CDR Okay. Am I dirty.

04 22 59 58 CDR Okay, Houston. What do you want me to do? Get in?

04 23 01 01 CDR Hello, Houston. What happened to Houston, Al?

04 23 01 03 LMP We'd better go off the LUNAR SURFACE for a minute.

04 23 01 06 CDR Al, wait a minute. Hold it, Houston.

04 23 01 08 LMP They may be having a site handover.

04 23 01 10 CDR Yes.

04 23 01 11 LMP Got good signal strength.

04 23 01 13 CDR I'm looking at that Surveyor. We can look around that crater - on the left side. That looks like bedrock over there, doesn't it?

04 23 01 19 LMP Uh-huh.

04 23 01 20 CDR And just ease right down the side of that baby over there, to Surveyor.

04 23 01 22 LMP Hello, Houston. How do you read?

04 23 01 24 CDR What happened to them? You all ready for me to come in, Al?

04 23 01 25 LMP I'm ready. It's up to them.

04 23 01 26 CDR Wonder what happened to Houston.

04 23 01 28 LMP I'm not sure that that LUNAR STAY didn't do it. I'd rather go back on TRACK and get them back. Of course, we've got fuller signal strength.

04 23 01 37 CC Intrepid, Houston. Stand by.

04 23 01 38 CDR Okay, what's your problem?
Okay, we had a changeover from one site to another, down here. It was all on our end. No problem with your antenna. It's working well.

Okay, you guys ought to call those things out in advance. That's been happening all the way through this flight.

Roger, Pete. We concur.

Okay, what do you want me to do --

And go ahead and press on on the ingress.

Okay. All right, Houston.

MARK.

I'm on the footpad.

That was easy.

I just closed my feedwater. You might want to do that, too.

That's probably a good idea. Let me see if I can find it back here. Okay, I just closed mine. Coming up the ladder.

Gosh, you're shaking the whole LM.

Sorry about that.

*** get a warning, because you haven't got your feedwater, but that's okay. You've got cooling for quite a while.

Yes. Understand. Okay, one garbage bag. Anything else in there you want to get rid of?

Not a thing.

All right, hand me the LEC.

Okay, the LEC's got kind of a little slipknot in it because of the - Got it?
04 23 03 22 CDR  Yes.
04 23 03 23 LMP  Letting it go.
04 23 03 24 CDR  It's okay.
04 23 03 28 CC  Pete, on your way through the hatch, will you give a check on the seal?
04 23 03 31 CDR  Check on the seal.
04 23 03 32 LMP  Yes. I can see it probably better than he can from this side, Houston. Seal looks real good. I'll tell you what we did do; when we got out, we - -
04 23 03 42 CDR  I can't believe I did that.
04 23 03 44 LMP  Yes, you did. Because I remember, you were hitting here and then when I backed up, I could - I'll tell you - we probably just ought to put a piece of tape over it.
04 23 03 52 CDR  Okay. That's my feedwater.
04 23 03 53 LMP  We broke through the skin on the hatch, and for about a 10-inch cut, there; and it didn't hurt the insulation, didn't hurt the hatch, and I don't know whether you want us to put a piece of tape on there or just forget it. It doesn't look like it's going to bother anything.
04 23 04 12 CDR  I'd say just forget it.
04 23 04 13 LMP  Okay, Pete.
04 23 04 14 CDR  Why don't you get over on your side?
04 23 04 15 LMP  Okay. Let me move over.
04 23 04 16 CDR  Okay.
04 23 04 18 LMP  I just checked your circuit breakers, and they're all good.
04 23 04 20 CDR  All right.
04 23 04 25  LMP  Just a second; I'm not out of the way, yet.
04 23 04 27  CDR  All right, but I want you to hold the door for a minute while I --
04 23 04 29  LMP  Okay.
04 23 04 30  CDR  -- close this front --
04 23 04 31  LMP  Well, I've got to get out of the way.
04 23 04 33  CDR  -- front thing here.
04 23 04 34  LMP  Okay.
04 23 04 37  CDR  Yes, all right.
04 23 04 39  CC  Pete, we concur. No tape.
04 23 04 40  LMP  Okay.
04 23 04 42  CDR  Okay.
04 23 04 44  LMP  Now, wait a second, Pete. Let me back up a little better.
04 23 04 48  CDR  Okay, tell me which way to go.
04 23 04 49  LMP  Just a second. Okay, you're just perfect. Shoot right on in. Get your chest down and your rear end up -- there you go; got it. Go a little bit to the left. Go a little further until your head bumps. Do a pushup and you're fat -- little bit to the left, little bit further to the left. That's it. Up.
04 23 05 12  CDR  Okay.
04 23 05 14  LMP  You're in the best possible position. Scoot in in a little more -- and you got it.
04 23 05 17  CDR  I'm in; no sweat.
04 23 05 19  LMP  Okay. Now careful when you turn around. You've got -- ...
04 23 05 21  CDR  Yes.

Oh, you do, too.

... watch your turn now. I'll get this hatch. Okay, it says PLSS feedwater, closed. We did that. Forward hatch closed and locked. When you're out of the way, I'll slide over and lock it.

Am I out of the way?

Not yet.

Wait until I turn around. Just a minute.

Okay?

Okay.

Let me get down on my hands and knees and lock this thing. I need a push down. Wait just a second; let me raise my visor so I can see what's going on in here.

Okay.

Can you give a push-me-down?

I am pushing you down. Need further?

Just back up, and let me tilt further forward, which is just as good.

I can't go back any further. Why don't you let me close it?

Okay, see if you can reach it. It's just a little bit out of my reach; you might be able to get it. Okay, easy.

I'm ready.

Let me get back here in the corner. Watch your PLSS. There you go.

Hatch closed.

Did you get it?
04 23 06 38 CDR Yes.
04 23 06 39 LMP Good show.
04 23 06 40 CDR Okay.
04 23 06 41 LMP Okay, next one. DUMP valve, both AUTO. I've verified this one; verified that one.
04 23 06 47 CDR That one's AUTO.
04 23 06 48 LMP Okay. Let me look at something first. Okay.

PLSS $O_2$ and PRESS flags may come on during REPRESS; if PLSS $O_2$ less than 10 percent, manually control cabin REPRESS to maintain positive PGA pressure. Forget it. Okay, LIGHTING ANUNCIATOR AND NUMERICS, BRIGHT.

04 23 07 10 CDR Wait a minute, easy. There you go.
04 23 07 17 LMP Okay, now I'm going to go over here, over just a little so I can turn around. Oh, you did your circuit breakers? The best I can; easy does it.

04 23 07 27 CDR What are you trying to do?
04 23 07 29 LMP Get that STOP button depressed.
04 23 07 31 CDR Yes.
04 23 07 32 LMP I've got to turn around. REPRESS valve. Okay?
04 23 07 36 CDR Well, I can reach the REPRESS valve, if you want.
04 23 07 39 LMP No, I've got it here.
04 23 07 41 CDR That does it.
04 23 07 42 LMP Why don't you reach it? It may be better if you could.
04 23 07 45 CDR Can you reach CABIN REPRESS to what, AUTO?
04 23 07 48 LMP CABIN REPRESS to AUTO. PRESS REG's A and B to CABIN.
04 23 07 52  CDR  Okay.
04 23 07 53  LMP  MASTER ALARM in this CABIN REPRESS. Let's watch
the pressure. Cabin pressure is starting up.
04 23 08 05  CDR  One psi.
04 23 08 17  LMP  Coming in.
04 23 08 19  CDR  Huh?
04 23 08 20  LMP  It's coming in good.
04 23 08 24  CDR  ... as usual.
04 23 08 26  LMP  Suit pressure's looking good.
04 23 08 34  CDR  Two and one half; PISS O₂, OFF.
04 23 08 36  LMP  What did you get? That's it; a little bit more.
04 23 08 51  CDR  That's it. PISS O₂, OFF. Can you verify that I've
got mine off?
04 23 09 02  LMP  What?
04 23 09 03  CDR  Will you verify that I've got mine off?
04 23 09 05  LMP  I'll pull your diverter valve up, and check your
water, and you do have it off.
04 23 09 16  CDR  Okay, Houston. There's the cabin at 4.6.
04 23 09 20  LMP  Okay, MASTER ALARM. Let me turn it off. Okey-
doke.
04 23 09 29  CDR  Let me operate yours, too.
04 23 09 33  LMP  Okay.
04 23 09 43  LMP  Okay. CABIN REPRESS valve closes at 4. Verify
CABIN PRESS stable. Okay.
04 23 09 57  CDR  CABIN GAS RETURN to AUTO.
04 23 09 59  LMP  Okay, CABIN GAS RETURN, AUTO.
04 23 10 01 CDR   Wait a minute.
04 23 10 02 LMP   Get over here.
04 23 10 04 CDR   Okay. AUTO.
04 23 10 10 LMP   SUIT CIRCUIT RELIEF, AUTO.
04 23 10 11 CDR   That's already AUTO.
04 23 10 12 LMP   That's right. SUIT GAS DIVERTER, push CABIN.
04 23 10 17 CDR   Push CABIN.
04 23 10 18 LMP   Verify EVA circuit breaker configuration on your side: SUIT FAN number 1, closed.
04 23 10 23 CDR   Wait just a second. SUIT FAN 1, closed and I'll close the SUIT FAN DELTA-P. Okay.
04 23 10 31 LMP   And I also notice ECS caution and H₂O SEP, and I've got them. And COMM: TV, OPEN. Houston, do you want me to turn off the TV or leave it on?
04 23 10 44 CC    Affirmative, Al. Turn it off.
04 23 10 50 LMP   Okay, and it says doff gloves, helmets, visors, and all that. Hey, let's go off RELAY. We're going off RELAY right now, Houston.
04 23 10 59 LMP   How do you want me to go, Al?
DAY 6

05 11 02 08 CDR ... ON.
05 11 02 09 LMP It's ON.
05 11 02 10 CDR VHF ANTENNA to EVA.
05 11 02 11 LMP EVA.
05 11 02 12 CDR UPLINK SQUELCH, enable.
05 11 02 13 LMP UPLINK SQUELCH is enabled.
05 11 02 14 CDR LMP connect to PLSS COMM, AUDIO CB:
05 11 02 15 LMP Okay.
05 11 02 16 CDR ... PLSS mode, LMP to A.
05 11 02 17 LMP A.
05 11 02 21 CDR Hello there.
05 11 02 22 LMP Read you loud and clear, Pete.
05 11 02 24 CDR Read you the same. You should have a tone on, a VENT flag, a P, and a PRESS flag 0.
05 11 02 28 LMP Got them.
05 11 02 29 CDR PLSS O₂ PRESS gage greater than 75.
05 11 02 31 LMP It is.
05 11 02 32 CDR We have a good COMM check with me. No, I'm sorry; we don't need that. Commander's gone to PLSS COMM.
05 11 02 39 LMP Okay.
05 11 02 40 CDR Hold the card.
05 11 02 47 LMP A and B is OFF. Okay. PLSS mode, Commander to B. You get no MSFN reception.
05 11 02 54 CDR Hello there. I read you loud and clear. I got a PRESS 0 flag.

05 11 02 56 LMP Read you the same.

05 11 02 58 CDR I got an O₂ flag and I've got 80 percent.

05 11 03 02 LMP Okay. VENT flag, P, and a PRESS flag 0. That's what I've got. You don't have an O₂ to begin with, do you?

05 11 03 08 CDR No, I've got an O₂ PRESS and a VENT.

05 11 03 10 LMP O₂ will go out in a minute. Okay?

05 11 03 12 CDR Yes.

05 11 03 13 LMP Okay. PLSS O₂ greater than 75?

05 11 03 14 CDR Yes.

05 11 03 15 LMP Okay. Perform COMM - we did that. PLSS mode - I'll go B and you go A. How do you hear?

05 11 03 24 CDR Loud and clear.

05 11 03 25 LMP Read you the same. Okay. PLSS mode, both of them, AR.

05 11 03 29 CDR Okay.

05 11 03 30 LMP How do you read?

05 11 03 31 CDR Loud and clear. Houston, Intrepid. How do you read?

05 11 03 44 CC Intrepid, we read you both loud and clear.

05 11 03 45 CDR Very good. Very good.

05 11 03 47 LMP Okay, Houston, LMP's O₂ quantity is 80 percent.

05 11 03 53 CDR And so's the --

05 11 03 55 CC 80 percent. Copied.

05 11 03 57 CDR -- and CDR, 80 percent, also.
05 11 03 59  LMP  Okay. We are opening the TV circuit breaker right now.
05 11 04 00  CC   Roger.
05 11 04 03  CDR  Final systems PREP --
05 11 04 06  CC   Roger.
05 11 04 07  CDR  -- CB(16):ECS: CABIN REPRESS, close; verify.
05 11 04 11  LMP  It's closed.
05 11 04 12  CDR  Fan DELTA-P, opened.
05 11 04 14  LMP  It's opened.
05 11 04 15  CDR  CB(11):ECS: SUIT FAN 1, open.
05 11 04 17  LMP  Okay.
05 11 04 18  CDR  Verify ECS CAUTION and H₂O SEP component lights on.
05 11 04 22  LMP  On in a minute. Yes.
05 11 04 24  CDR  Okay. Suit GAS CONVERTER, pull - EGRESS.
05 11 04 26  LMP  Pull? I'll get it. Okay, pull - EGRESS.
05 11 04 28  CDR  Okay. CABIN GAS RETURN to EGRESS.
05 11 04 30  LMF  CABIN GAS RETURN to EGRESS. And verify that the SUIT CIRCUIT RELIEF is in AUTO.
05 11 04 37  CDR  SUIT CIRCUIT RELIEF is in AUTO.
05 11 04 39  LMF  Okay.
05 11 04 40  CDR  Connect to the OPS's.
05 11 04 42  LMF  Okay. Just a second. There is your hose. Let me button your flap. Okay.
05 11 05 10  CDR  Now, if you will turn the other way, I will get your other side.
05 11 05 14  LMF  Just a second. Okay. Turn to the right here. Got it.
05 11 07 05  CDR  Easy does it, that's a boy. MASTER CAUTION, an ACO SEP light, and an ECS light; that's the ones we wanted.

05 11 07 13  LMP  Yes.

05 11 07 14  CDR  Okay. Now, let's me - get it.

05 11 07 17  LMP  Where are you going?

05 11 07 18  CDR  Down here just a little bit.

05 11 07 23  LMP  And I get that to snap - Can't see, that's - Okay, that's all snapped. Okay?

05 11 07 27  CDR  Okay. All right. Do you want to get - Oh, wait a minute, one other thing, right here. Got it. I snapped your - OPS hose in the side of the PLSS there.

05 11 07 43  LMP  Okay. Did you trim this thing out?

05 11 07 44  CDR  Yes.

05 11 07 45  LMP  Okay. Let me do that to you now.

05 11 07 47  CDR  Okay.

05 11 07 49  LMP  And we throw in a couple of purge valves then.

05 11 07 51  CDR  Yes, I got the purge valves right now.

05 11 07 54  LMP  Okay. This'll finish you off.

05 11 07 58  CDR  Okay.

05 11 08 19  CDR  ... do that?

05 11 08 20  LMP  Yes, sir.

05 11 08 21  CDR  That's verified locked.

05 11 08 22  LMP  Okay. Let me check you. Your's good.

05 11 08 25  CDR  And let me disconnect you from your suit hoses.

05 11 08 28  LMP  Okay.
05 11 08 29  CDR  You're disconnect.
05 11 08 40  CDR  Okay, that's good.
05 11 08 42  LMP  This would be easier if you'd -
05 11 08 47  CDR  Okay. Tuck this in.
05 11 08 59  LMP  It's not in. You're going to have to do that; I can't see it.
05 11 09 02  CDR  I'll do it. Okay. What'd you have to do --
05 11 09 08  LMP  Purge valve.
05 11 09 09  CDR  Okay.
05 11 09 11  LMP  Get it started and rotate it with that counter-rotate thing you got.
05 11 09 16  CDR  That's locked and that's locked; while I'm down here, let me -- that's locked, locked.
05 11 09 21  LMP  Okay. That's it.
05 11 09 23  CDR  Hoses under the flap, huh? Let me check all yours - 1, 2.
05 11 09 27  LMP  Okay.
05 11 09 29  CDR  Safety's in, safety's in. That safety's in and that safety's in. Okay, they look good.
05 11 09 40  LMP  Verify PLSS centered and proper height.
05 11 09 42  CDR  Yes. Mine is. Okay. Take a drink and DESCENT H_2O, closed.
05 11 09 46  LMP  Okay.
05 11 10 04  CDR  Okay.
05 11 10 28  CDR  And H_2O, closed. Okay. Position mikes.
05 11 10 34  LMP  Okay.
05 11 10 35  CDR  PLSS fan, on.
On.
And VENT flag.
Wait a minute.
Don helmets, then visors.
Okay.
This one is *** yours.
Okay.
Pull that.
Okey-dokey.
Yes, helmet's locked.
That sounded real good.
Yes.
And your helmet is locked.
Okay.
Hold still and I'll put this on.
All right. It's a bit cool in here today.
Give you a little chilldown with this LCG. Okay.
Okay, then leave them on.
Just a second.
... First, let me get it all down in the back and everything. Okay, heist her.
Okay. You got it.
Intrepid, Houston.
Go, Houston.
Here you go, snug as a bug in a rug.

In looking at the TV, it appears we'll be leaving the TV off for this, so if you would take the - keep that circuit breaker out and go to S-BAND MODE, PM.

Okay. We'll do it in just a minute.

Okay - up. Okay, Pete. ... look up.

Houston, I'm sure sorry the TV didn't work. It's a beautiful sight to see - Intrepid and Surveyor sitting here on this crater.

Roger, Pete. We'll be waiting for those pictures.

Hey, lift up your PLSS.

Okay.

Okay. You're all buttoned in.

Beautiful.

Okay. Next.

Here's a pair of gloves for you.

Okay. PLSS FAN on down here and visors -

Okay. LCG pump open?

Yes. Right now.

Okay. And you might as well get the TV and S-band reconfigured. The TV's still out, of course.

Okay. We're going to PM, Houston.

There's PM and --

Roger.

Disconnect IM hoses and stow - Connect PLSS H₂O hoses and stow IM hoses.
05 11 14 13  CDR  Okay.
05 11 14 27  LMP  I'm going to turn around here, Pete.
05 11 14 29  CDR  Okay - and I've got my hoses off. How come - how come we don't have our gloves on yet?
05 11 14 37  LMP  ... - Do this first.
05 11 14 39  CDR  Okay. Very good. Can't see the checklist, that's all.
05 11 14 44  LMP  Go ahead and get all spiggied up there.
05 11 14 47  CDR  Okay.
05 11 15 05  CDR  Okay, my PLSS water is hooked up.
05 11 15 08  LMP  Okay, let me turn around.
05 11 15 10  CDR  Okay, and I'm ready to do - the hoses.
05 11 15 12  LMP  Okay. Get yours routed and hand them to me and I'll stick them in.
05 11 15 15  CDR  Okay, coming up and over. Take it around real easy. Okay, now. I've got to get over there against the hamper.
05 11 15 25  CDR  Coming over.
05 11 15 51  CDR  I hung up again.
05 11 15 53  LMP  I don't know; let me see. You look okay.
05 11 15 56  CDR  I can't move in for some reason.
05 11 15 59  LMP  Move over my way just a little way.
05 11 16 01  CDR  Never mind, I'm going to do it with these.
05 11 16 03  LMP  All right. You're kind of hung up on the flight data file.
05 11 16 06  CDR  This is going to do it better anyhow. Done it that way yesterday. How's that look?
05 11 16 12  LMP  Looks good to me.
05 11 16 13  CDR  Okay, that's pretty steamy. Here's a pair of gloves for you.

05 11 16 15  LMP  Let me grab that checklist again.

05 11 16 16  CDR  Okay.

05 11 16 24  LMP  Verify the following: helmet and visors, locked and adjusted.

05 11 16 29  CDR  Okay.

05 11 16 36  LMP  Okay, you're locked and adjusted.

05 11 16 41  CDR  Okay, torso tiedown adjusted.

05 11 16 45  LMP  I can see that you are locked - I can see it - in good shape. Okay.

05 11 16 52  CDR  Okay, torso tiedown.

05 11 16 53  LMP  Mine's okay.

05 11 16 54  CDR  Mine's okay, too.

05 11 16 56  LMP  Okay. O₂ connectors - Let me check all yours, then you can check all mine. Those are vertical - in - locked. COMM is locked; let me see about your water.

05 11 17 25  LMP  Water's locked. Everything's locked.

05 11 17 27  CDR  Okay, you look good.

05 11 17 28  LMP  I've been over these a couple of times; every safety - -

05 11 17 30  CDR  Hey, does that water look good?

05 11 17 31  LMP  - - and I checked your water. It's in and locked - things are flush.

05 11 17 35  CDR  Okay.

05 11 17 39  LMP  Purge valves are all in. Okay, don EV gloves and lock them up.
05 11 17 46 CDR  Okay, here's a pair for you.
05 11 17 51 LMP  Thank you.
05 11 19 15 CDR  Find it? The right one of mine didn't want to do it either.
05 11 19 19 LMP  Take it off again.
05 11 19 33 CDR  Can't tell whether they're in or not.
05 11 19 36 LMP  ..., Pete?
05 11 19 41 CDR  Verified. Pull this one open.
05 11 19 48 LMP  Just a second.
05 11 19 54 CDR  Why don't you just let me have it?
05 11 19 56 LMP  Okay. There you go.
05 11 20 16 CDR  Now, then. There you go. Now do it; push your button down.
05 11 20 24 LMP  Turn yours in a smidgeon.
05 11 20 26 CDR  Huh?
05 11 20 28 LMP  Do it this way.
05 11 20 39 CDR  The left-hand one hangs up.
05 11 20 41 LMP  Doesn't want to do it, does it? There it did. I can't do it with your -
05 11 20 50 CDR  Got them in there?
05 11 21 04 LMP  It never fails, does it? The one time you don't want something to hang up with you, it's going to start fogging up.
05 11 21 11 CDR  There you go; let me look at it.
05 11 21 16 LMP  Got her.
05 11 21 17 CDR  That's a ... is out of there. Everything looks good.
05 11 21 30 LMP ... Let me see that locked?
05 11 21 32 CDR Okay, verify mine.
05 11 21 36 LMP I can't see it. There, that's locked.
05 11 21 42 CDR It's locked.
05 11 22 18 LMP *** Diverter is in MIN; I'm going to PUMP, on.
05 11 22 34 CDR Verify it's locked.
05 11 22 57 CDR Then tie this thing.
05 11 22 59 LMP Okay.
05 11 23 04 CDR Locked?
05 11 23 05 LMP Yes, sir.
05 11 23 15 LMP PLSS DIVERTER, MIN. PUMP.
05 11 23 19 CDR Right. PUMP's on and I'm beginning to be sucked down. Let's get the cabin to EGRESS, okay?
05 11 23 25 LMP EGRESS.
05 11 23 26 CDR Can you get them?
05 11 23 27 LMP EGRESS.
05 11 23 28 MS Mode's in EGRESS. ...
05 11 23 30 CDR Okay. Jettison bag is up - the LHSSC is unstrapped. It's got PLSS batteries, Li cartridges --
05 11 23 38 LMP All that other?
05 11 23 39 CDR Yes. Position ETB on engine cover.
05 11 23 42 LMP Where is it?
05 11 23 43 CDR Huh?
05 11 23 45 LMP Right here.
05 11 23 47 CDR Okay.
05 11 23 49 LMP Here you go.

05 11 23 52 CDR Turn around, I got her.

05 11 23 53 LMP Okay. Turn around.

05 11 23 55 CDR Okay. Back on the engine cover that was.

05 11 23 59 LMP Don't hurry, I'm getting my - going to get my EV-CB batteries still.

05 11 24 03 CDR I - get my CB's real quick. Row 1: One, in. Out - One, out; three, in; one, out. Those are in. FAN 1 is in; CABIN FAN 1 is out; GLYCOL AUTO TRANSFER is - all in. And out. Two in, all the way out to SIG CONDITIONER, that's out, ... out. All out but MISSION TIME.

05 11 24 45 LMP Hey, these guards are really good.

05 11 24 47 CDR Three - out. That's it.

05 11 24 56 LMP Okay. Same here, they all look good.

05 11 24 57 CDR Ready for a PRESS INTEG check.

05 11 24 59 LMP Okay. PLSS O2, on.

05 11 25 12 CDR Yes, oh boy, does that feel better.

05 11 25 16 LMP Got a O2 0 flag; PRESS 0 flag.

05 11 25 20 CDR Pressure's coming up good.

05 11 26 02 CDR Coming up.

05 11 26 24 LMP I'll make it.

05 11 26 25 CDR Okay.

05 11 26 31 LMP I'm to set it at a regulated 3.9, for some reason.

05 11 26 35 CDR I've got to get my O2 off.

05 11 26 39 LMP You ready? Okay. Let's see what that says.
05 11 26 46 CDR Mine's off.
05 11 26 47 LMP Okay. Let's time it.
05 11 26 49 CDR ... set.
05 11 26 52 LMP Stop.
05 11 26 53 CDR Thanks for that.
05 11 27 33 CDR Okay, Houston. The decay checks look pretty good; are we GO for EVA?
05 11 27 44 CC Stand by, Intrepid. You are GO for EVA, Pete.
05 11 27 48 LMP ... I get my OX back.
05 11 27 50 CDR Roger. Okay. What are you going to do?
05 11 27 54 LMP Get my oxygen back on.
05 11 27 55 CDR Okay. Same here. My oxygen's back on. Very good, a tone, then an 0, looks good.
05 11 28 07 LMP Confirmed. Okay, CABIN REPRESS VALVE, closed.
05 11 28 10 CDR Okay.
05 11 28 12 LMP I'll get it.
05 11 28 13 CDR Okay.
05 11 28 17 LMP CABIN REPRESS valve, closed.
05 11 28 20 CDR Okay.
05 11 28 21 LMP Wait a minute; it's not all the way. Okay, closed. What else?
05 11 28 26 CDR Okay. I'm going to drop the *** now for the forward dump valve.
05 11 28 30 LMP Excuse me.
05 11 28 31 CDR I'm hung up on something.
05 11 28 34 LMP Okay.
05 11 28 36 CDR Not a lot of room.
05 11 28 37 LMP Okay.
05 11 28 49 CDR Okay, four ... There you go.
05 11 28 58 LMP Okay.
05 11 28 59 CDR Okay, 3.5; verify cuff gage does not below - drop below 4.8.
05 11 29 03 LMP Okay, the suit loop is 4.1 --
05 11 29 07 CDR Mine's 4.8.
05 11 29 08 LMP -- my cuff gage is 4.95.
05 11 29 11 CDR Okay, cabin at 3.5 - it is?
05 11 29 14 LMP Yes.
05 11 29 15 CDR IM suit circuit 3.6 to 4.3?
05 11 29 18 LMP It is.
05 11 29 20 CDR PGA greater than 4.8?
05 11 29 22 LMP And decaying.
05 11 29 23 CDR Looks good.
05 11 29 24 LMP Go.
05 11 29 25 CDR Start your watch.
05 11 29 27 LMP Okay.
05 11 29 31 CDR Got it started?
05 11 29 32 LMP Yes.
05 11 29 34 CDR Forward dump valve to open.
05 11 29 35 LMP Yes.
05 11 29 37 CDR Dump it.
05 11 29 40 LMP Coming down, Pete.
05 11 29 57 CDR Is something open?
05 11 29 58 LMP No, that little - ... cap - popped off.
05 11 30 12 CDR Cabin's 1 pound.
05 11 30 13 LMP Okay.
05 11 30 27 LMP And I'm 5.0, and the suit loop is 4.0, and the cabin is a half, about 0.6.
05 11 30 33 CDR Okay.
05 11 30 59 CC Everything looks good down here, Pete.
05 11 31 00 CDR Roger. It looks good up here.
05 11 31 02 LMP Okay, there goes a - H20.
05 11 31 07 CDR Got one too?
05 11 31 08 LMP Yes, there it goes. Push to PRESS.
05 11 31 13 CDR Okay, cabin is still about 2-1/2; it's 0.25, Al.
05 11 31 18 LMP Okay.
05 11 31 19 CDR Just let it bleed for a while.
05 11 31 20 LMP Okay.
05 11 31 44 LMP My suit's still 4.9.
05 11 31 45 CDR You'll have to jiggle on it a little bit.
05 11 31 51 LMP Okay.
05 11 31 54 CDR Probably still outgassing. All right, let her go for a while. Let her go, still - still a little bit more.
05 11 32 05 LMP These suits are bleeding down, too. See.
05 11 32 21 CDR They're holding it at that 0.2. Jiggle that.
05 11 32 29 LMP Okay. Think I can get her now, Pete.
05 11 32 39  CDR  Everything all right?
05 11 32 40  LMP  Got her.
05 11 32 41  CDR  Okay. You hold her open.
05 11 32 42  LMP  Look at all that stuff whistle out the door.
05 11 32 44  CDR  I'll hold it. I got it open.
05 11 32 45  LMP  Got it?
05 11 32 46  CDR  Yes.
05 11 32 53  LMP  Just a second. Got my foot by it.
05 11 32 58  CDR  All right. There you go. Okay. Now, I'm going to put this DUMP valve to AUTO.
05 11 33 06  LMP  DUMP valve to AUTO. My feedwater is on.
05 11 33 14  CDR  Okay, that DUMP valve look in AUTO?
05 11 33 16  LMP  Let me check. I can't see. Yes, sir, it looks in AUTO.
05 11 33 20  CDR  Okay. Now, let's just hold this door open right here like that. Get my feedwater on.
05 11 33 25  LMP  Okay.
05 11 33 41  CDR  While we're standing here, why don't we jettison this gear? If you'd just back into the corner.
05 11 33 48  LMP  Just a second, Pete. Wait until the suit pressure goes down a little bit.
05 11 33 59  CDR  All right, leave that right where it is.
05 11 34 01  LMP  What do you want to do?
05 11 34 03  CDR  Close it.
05 11 34 04  LMP  I will. If you stick it in the crack here - No, stick it in that crack right there. There's a good spot.
05 11 34 10  CDR  That a boy.
05 11 34 11  LMP  Yes. Get that hatch all the way back, I'm going to get this gear out of here.
05 11 34 19  CDR  That's all right.
05 11 34 24  LMP  Will you stand there and make sure that my water is on all the way?
05 11 34 28  CDR  Okay. You'll have to turn.
05 11 34 29  LMP  Okay.
05 11 34 31  CDR  You're on.
05 11 34 32  LMP  Okay.
05 11 34 36  CDR  Turn further than that, please.
05 11 34 38  LMP  Okay.
05 11 34 39  CDR  Wait - wait. That's outgassing (laughter).
05 11 34 53  CDR  It's all the way out.
05 11 34 54  LMP  Okay. My water light is out; I have a good boiler.
05 11 34 58  CDR  Mine isn't out yet.
05 11 35 00  LMP  Okay.
05 11 35 02  CDR  Now. Get rid of this baggage here. Back up.
05 11 35 09  LMP  Caution and warning status check is okay.
05 11 35 11  CDR  All right.
05 11 35 26  LMP  Get it.
05 11 35 27  CDR  Did it make it?
05 11 35 28  LMP  No, it's sitting on the front porch, but it's okay. My suit's still pretty high, 4.3. LIGHTING ANNUNCIATOR/NUMERICS, DIM.
05 11 35 37  CDR  Okay, let me turn.
05 11 35 38 LMP Okay.
05 11 35 40 CDR Towards you.
05 11 35 41 LMP Okay. It's DIM.
05 11 35 50 CDR Yes.
05 11 35 55 LMP Okay, I'm just - Tell you what; why don't you release my antenna? Adjust that flap; no, that flap right there.
05 11 36 07 CDR Flap.
05 11 36 08 LMP Okay.
05 11 36 13 CDR I'm pulling mine and then when you go down to go out, I'll take yours out.
05 11 36 15 LMP Okay. Up?
05 11 36 23 CDR Fine. I'm ready to go.
05 11 36 27 LMP Okay, just a second.
05 11 36 28 CDR All right. Let me - hold my knee against that - That Velcro doesn't hold worth a hoot.
05 11 36 34 LMP Okay, out you go.
05 11 36 36 CDR Okay.
05 11 36 43 LMP Don't get hung on there. Anything?
05 11 36 46 CDR No.
05 11 36 47 LMP Okay. That's the way; you're centered good this trip. That's good. Move a little bit to the left - little bit to the left; there you go. You better get that antenna as you go.
05 11 37 02 CDR Okay. It's out. Get it?
05 11 37 06 LMP Yes, ready to go.
05 11 37 07 CDR Okay.
Move a little bit to your right - and you're out the hatch - and I'll be standing by to get the LEC.

Wait a minute. Must be going off; did the bag go off?

I can't tell.

I can't either. Okay. Good shape. Okay. Do you want to hand me the LEC? I mean the - the left-hand side stowage, you want to get rid of it?

Let's get rid of it.

All right.

You okay?

Okay.

Check it. Open the hatch a little more and give it a kick.

And I'm standing by for the LEC.

All right, wait a minute. The LEC, coming at you. I've got to bring it up. Wait a minute.

Okay. Got it.

There you go. I'm headed down the ladder.

All right.

Now, the cameras.

Okay.

Whoops, long step. Okay, Houston -

MARK.

I'm on the lunar surface.

Roger. Copy, Pete.
One of these contrast charts fell down here yesterday, Al, so there's only two good ones; the other one's too dirty.

All right.

It doesn't rap off; it just -

Okay, ready to transfer ETB when you are.

Okay. Coming right after it, right now.

Looks like the lock on this ETB - I mean the lock on the LEC is - jammed with -

Dirt?

Dirt, yes.

Pull away.

Huh?

Pull away.

Oh, it may - have to let it out easier. Okay, let it go. Just lower it. Lower. All right, just lower it some more - and hold it right there.

Okay.

Boy, I'll tell you, I'm going to learn - two things I'm going to learn to dislike, and one of them's a TV cable and the other one's the S-band antenna cable.

Roger, Pete. We copy that.

And they are constantly underfoot.

All right. Now, let me take it across to the other side - where it's out of your way.

Okay.

Al, before egress, would you confirm that the TV circuit breaker is out?
05 11 42 26 LMP Confirmed; out.
05 11 42 30 LMP It is out, Houston.
05 11 42 32 CC Roger.
05 11 42 36 LMP Okay.
05 11 42 37 CC Roger, Al.
05 11 42 46 CDR ..., my friendly gnomon. In all that ... activity yesterday, I forgot all about him sitting here.
05 11 44 19 CDR What you up to, Al?
05 11 44 21 LMP Getting this camera set.
05 11 44 22 CDR Okay. Got SRC 2 - Working away here.
05 11 44 53 LMP Okay. Let me check all the circuit breakers and I'll be out with you.
05 11 44 57 CDR Okay.
05 11 45 11 CDR Down that side.
05 11 45 15 LMP Do you have enough?
05 11 45 42 CDR I'll tell you, these Teflon bags don't hold up too well in a vacuum. In a lunar environment, I'll put it that way.
05 11 45 56 CC Roger, Pete. We copy that comment. Any clarification?
05 11 45 58 CDR Yes, they tend to have fatigue failures along the cracks when you go to open them up. I notice the two bags that I put in the SRC yesterday - they're that way. And, let me get back here just a second; let's see, pass LEC, ETB transfer, geology PREP, stow on HTC; contrast charts, extension handle, hammer, small shovel, and gnomon.
05 11 46 20 LMP Here I come, Pete.
Okay, have fun. Place SRC 2 on MESA, attach weighbag to scale, attach saddlebag to LMP. There's one thing that's bothering me; I don't have that saddlebag. I wonder - why I don't. Might I find one? Ah ha ha, here's one. ..., how are you doing?

Good.

Check. Okay - keep coming - you're in pretty good shape. There you go - a little - a little ...

I'm trying to close this hatch.

Oh, okay.

Right now, this stuff, this - material around the spacecraft reminds me - in this Sun angle, looking into the Sun - a very rich brown color - it reminds me of a good plowed field.

Looking down-Sun, it's still the same old ash gray, very light white ash gray.

Roger, Pete.

Okay. LMP's off the footpad.

Okay, LMP. How about let's get a - a Surveyor parts bag here?

All right, just a second, Pete. All right, and thermal visors.

Huh?

I'm going to pull down those little side visors.

They are - Houston. I think Al and I both find that these little side Sun visors are extremely handy.

Watch that rock box, I've got a strap down.

Roger, Pete. We copy.

Almost cold today on MIN cooling. How are you doing?
05 11 49 42  LMP  About the same. ... put that line right there, Pete.
05 11 49 48  CDR  Say again.
05 11 49 49  LMP  I'm going to set the tether right there and --
05 11 49 52  CDR  Okay.
05 11 49 58  LMP  Okay, and I'll put it on you here, babe.
05 11 50 03  CDR  How's that? Is that - You want me to stand low or high?
05 11 50 06  LMP  Low.
05 11 50 07  CDR  Okay. How's that?
05 11 50 10  LMP  Good.
05 11 50 12  CDR  Okay, got that one on - ... other side - Looking good so far.
05 11 50 26  LMP  You know, other than the large-size rocks - very, very difficult to determine a contact around here.
05 11 50 38  CDR  Okay - we looked.
05 11 50 48  LMP  Okay. Now, around to the side. We're putting the parts bag on Pete right now, Houston. Going on, okay. Real well ...
05 11 51 02  CC  Roger. We copy that.
05 11 51 03  LMP  Boy, Houston. That COMM is super; it sounds like you're right inside my helmet.
05 11 51 11  CC  Roger. The best SIM we've had.
05 11 51 14  LMP  I wonder what happened since yesterday?
05 11 51 21  CDR  I don't know; I think everybody learned a little --
05 11 51 23  LMP  Okay. That bag's on there; now, let's see what else.
05 11 51 26  CDR  I need to get the tool, tool, tool (singing). And before you put the tool in, we got to cut a TV cable.

05 11 51 32  LMP  All right.

05 11 51 33  CDR  Okay.

05 11 51 36  CC  That's affirmative. Cut the TV cable below the adapter --

05 11 51 38  CDR  Understand. Got it. On my way.

05 11 51 40  CC  -- about 1 inch and then -- that's 1 foot below the adapter, and then stow the TV camera in the ETB.

05 11 51 48  CDR  Okay. Hey, look at that Surveyor, Al. That's not anywheres near as bad a slope --

05 11 52 07  LMP  No --

05 11 52 08  CDR  -- Now that it's out of the shade.

05 11 52 09  LMP  Hey, Houston, that Surveyor looks a lot better today. Yes, now that the Sun's up on it, shone on it.

05 11 52 14  CDR  Get those TV cables cut. Now, wait a minute; leave it right on there for a second. Come on over and put the thing in my back and let's mount our cameras and then ETB. Is that all right?

05 11 52 24  LMP  Sounds good.

05 11 52 25  CDR  Or either that, bring it back -- I'm sorry.

05 11 52 26  LMP  It's okay. Doesn't make any difference. Here it is.

05 11 52 35  CDR  I think you got ... right here.

05 11 52 37  LMP  Got the right idea; that's the lunar walk. Okay. Stick it in here.

05 11 52 45  CDR  Look at that part number on the side of the tool.

05 11 52 55  LMP  ... that a few times.
Say, Houston, while he's putting the tool on, it's a very interesting thing. There is an angular rock that's literally 6 inches from the engine exhaust skirt. It's just sitting on the lunar surface, and I really find it hard to believe that the engine exhaust couldn't blow that rock away. It's only about 3-1/2 inches by 3-1/2 inches, and it's not stuck in the ground; it's just sitting there loosely about 6 inches from the engine bell; and, of course, the ground is blasted clean all the way around it and yet the engine exhaust blast didn't blow that rock away.

Pete, where's the saddlebag? You don't have one.

Roger, Pete. We copied that comment. Were you able to get a photo of that in the first EVA?

No, we'll get that right now. Is there one in here, Al?

Yes.

Oh.

And, Pete, now for your reference on the photos. Your shadow length now is 18 foot.

Okay.

Here's a couple of sneaky bags first ... this one.

Al, also if you would, before you start that traverse, would you get a good photo of the solar wind to show us how that foil is wrapped around?

Will do.

Okay, Houston, that won't take a second. Okay, let me attach this bag to — would you attach this bag to me, Pete?

Yes.

I'm going to slide that off at the same time. All right.
Okay, I'll tell you what, if you'd go put one camera - Here, the saddlebag's on - If you'd put one camera on, you look at those little - Go get the TV, I'll mount this other - gear on here. My compliments to the man that packed that SRC box; it looks just like the training boxes.

Hand me those tongs a second.

Yes, sir. Here's the tongs. Where are you?

Right behind you. Hold on just a second. Hold on; let's see what this is.

That's what left of --

Okay, got you.

-- some of those parts bags.

Got you.

Okay.

Okay - the core tubes. Come on; get out of there. If I didn't know better, I'd say there was solar wind up here, that blows hard enough to blow sample bags in the wrong direction. Okay, Al, three core tubes and the film.

Okay - take them.

-- got this stuff here coming up.

Okay.

Saddlebag.

Chart fits right in its back.

Worried about that.

Got it?

Yes, sir. It's in the saddlebag.

Okay. Now, here's the other thing here, that safety line.
05 11 57  22 LMP  Huh?  Oh, yes.
05 11 57  26 CDR  When I hook those on there, too, that thing's a
                  pain in the neck over there, the way they spread
                  out in the vacuum.
05 11 57  13 LMP  Okay.
05 11 57  32 CDR  And I got the gas sample tube here.
05 11 57  33 LMP  All right.
05 11 57  37 CDR  Gas sample tube coming up.
05 11 57  41 LMP  Okay.
05 11 57  42 CDR  Now, I need to get that safety line.
05 11 57  45 LMP  Okay, I'll put that over here, babe.
05 11 57  47 CDR  Okay, I'll get the safety line.  One safety line -
                    Whoops, excuse me.
05 11 57  51 LMP  That's okay.
05 11 57  53 CDR  I'll put my camera on; we'll put the TV camera in
                    the ETB, and away we go.
05 11 57  59 LMP  ... - ... take the ... There.
05 11 58  03 CDR  Thank you.
05 11 58  04 LMP  Right there.
05 11 58  08 CDR  Got it?
05 11 58  09 LMP  Yes, sir.  It's in.
05 11 58  10 CDR  Okay.  If you get your camera, I'll put that TV
                    camera in the ETB.
05 11 58  14 LMP  Okay.
05 11 58  15 CDR  Per their request.
05 11 58  23 CDR  Okay, from the local terrain, Houston, as you
                    know it right now, and with the polarizing filter,
                    have you got any particular place enroute to the
ALSEP or to head crater that you'd like polarizing pictures taken?

05 11 58 43  LMP  Hey, hold that, would you, Pete?

05 11 58 45  CC  We'll get back to you on that. Press on now -
the nominal plan right now.

05 11 58 49  CDR  Here, let me have it.

05 11 58 51  LMP  Okay, let me film the handle - -

05 11 58 52  CDR  Film the handle, yes. Hold it tight.

05 11 58 57  LMP  I got it as far as I can. Permanently mounted
that baby - -

05 11 59 08  CC  Pete, we have no preference on that. Go ahead and
take it as called out for in the cuff checklist.

05 11 59 12  CDR  Okay. Stick it in the ETB and we'll screw with
it later.

05 11 59 14  LMP  Good idea.

05 11 59 15  CDR  Handle in.

05 11 59 16  LMP  Okay.

05 11 59 17  CDR  Drop her. Okay, Houston, one TV camera in the
bag and - our plan of attack is - Al?

05 11 59 29  LMP  Go.

05 11 59 32  CDR  One picture of that rock under the descent
stage - -

05 11 59 34  LMP  Shall do.

05 11 59 35  CDR  -- Grab the handtool carrier and head for the
solar wind and grab a picture of that. In the
meantime, I'll lope off to the ALSEP and check
the SIDE's; I'll meet you at point 1 at head
 crater.

05 11 59 43  LMP  Okay.
If you see any Indians, don't shoot until you see the whites of their eyes.

Roger; we copy. And, Al, have you gotten the readings on the contrast charts?

Not yet and I plan to do that real quick.

Houston, Pete's on his way to the ALSEP. Okay.

Roger.

Roger, Al; we copy. And at ... minutes into the VA - EVA, you're pretty close to the nominal time line.

Okay. Very good.

Can the guy with the seismometer hear me running?

...

Okay.

Pete, we're watching you down here in the seismic data - looks as though you're really thundering right by it.

Yes, I - I ground to a halt there to switch to intermediate cooling. I noticed that - it is obviously a little bit hotter out here with the higher Sun angle right now. Okay, I'm approaching the infamous SIDE.

Roger. And we're able to copy your rest and now that you're moving again.

Okay. All right, Houston. The status is - Oops, I'm going to get dust in it. The cover is off, and it's pointed up at the sky at about a 60-degree angle.

Roger. Do not touch it right now, Pete. Which way is that pointing - relative to east-west?

It is pointed down-Sun.
Roger. Pete, no need to change the configuration; let's press on.

Okay. Now --

We copy that you've stopped on the seismic.

Yes. Where's me handy-dandy LMP?

He's contrast charting.

Oh, okay. Meet you at the head crater, pal.

Okay.

Oh, boy, is ... like I want that rock. Here's a dandy extra grapefruit-size-type goodie.

Find a crater with a shadow in it first; there's one.

Okay, Houston, I'm approaching a crater now, and I'm going to put the contrast chart in it - one on each side; one on the sunny side, one on the shadow side. I'll give you a report.

Roger.

There's the one on the sunny side.

Man, have I got the grapefruit rock of all grapefruit rocks. It's got to come home in the spacecraft; it'll never fit in the rock box. Okay, Houston, I'll tell you what I'm going to do. I'm going to wind up at the right place at head crater; and, while I'm waiting for Al, I'll roll a boulder for you. Okay, Houston? I'm now looking at --

Sounds good, Pete.

-- That crater is --

Okay, Houston. Can you give us a mark when you roll over --

Yes, I sure will. That crater is, by golly, a rather steep crater - a lot steeper than it looks from out the LM. It's --
05 12 04 35 LMP  Houston?
05 12 04 40 CC   Yes, go.
05 12 04 41 LMP   I'm looking at the contrast chart in the Sun, and I can see all the different shades. And I've taken a photo of it; now, look at the one in the shadow. In the shadow, I can see - Well, depends on how close I am. If I'm within about 3 feet of it or 4 feet of it, I can see all six shades. I'll take a picture here, then I'll back up.
05 12 05 08 CDR Let me ask you a question, Houston. How big a rock?
05 12 05 19 CC   Pete, Houston. I presume - whatever's a convenient size for you. We'll check that out, though.
05 12 05 25 CDR   Okay. The other rocks that I was talking to you about are pretty well buried, and they're pretty large; I don't think I could get one of them going.
05 12 05 37 LMP   Houston?
05 12 05 42 CC   Roger. We copy. Grapefruit-size or any size is fine.
05 12 05 47 CDR   Okay. Al, are you standing still?
05 12 05 51 LMP   I'll stand still; go ahead.
05 12 05 52 CDR   Okay. I'm standing still. Houston, on my mark, they're rolling -
05 12 05 58 CDR   MARK.
05 12 05 59 CDR   It's starting down - hit, hit, hit, hit. Now, it's just rolling. Roll, roll, roll, still rolling. Roll, roll, roll -
05 12 06 15 CC   Roger, Pete. We've got some jiggles that I can see here. We'll get a reading on it for you.
05 12 06 20 CDR   Still rolling - still rolling. Very slowly, still rolling. And it's stopped -
05 12 06 29 CDR   MARK.
Stop.

Okay, Houston, I looked - I'm looking at the contrast chart in the shadow; and, as I mentioned at 3 feet, I can see all six. If I back up maybe to 10 feet, as long as I stand here a moment and adapt my eyes, I can see all six also. Now, the thing that seems to have the biggest effect on it is how low the Sun is. The Sun is high now and so I don't have to squint my eyes particularly, looking in that direction. Yesterday, looking into the same crater, even though it wouldn't be any darker in there because the Sun was there, I could - I would never be able to adapt. Right now, I can see all six marks, and I've taken the photographs. Going to go out and do solar wind now.

I can't see a lot of difference in visibility -

Roger, Al.

The only major difference I've noticed is the fact that when you're out here on these - this area, if you look cross-Sun, the Moon appears one color; if you look down-Sun, it's another; if you look up-Sun, it's another. But looking into shadows or anything else like that, it's pretty much the same as on Earth.

Copy that, Al.

Okay, I'll take some pictures here of the solar wind for you.

It doesn't look as pronounced, wrapped around the pole now that I get out here, Houston. It - looks pretty much like yesterday, just sort of, I guess it was sort of an optical illusion from inside the spacecraft. I took a couple of pictures of it, but I don't think there's anything unusual going on there.

Roger, Al. And, Pete, if it's convenient, and you can find another rock there and give her a heave, Experiments sure would like to see another one.
Okay, I was setting up my rock hole and all that - good things for the polarizing light. And - Say, I was looking at a rock that has small crystals in it. One of them is shining very, very bright green, like ginger-ale-bottle green.

Okay. Al, are you on your way?

That's affirm; I'm now making sure that everything is in the tool box - handtool carrier here.

I'm mounting them pretty firmly. Hey, Houston? As I was working around the handtool carrier a moment ago, the canvas bag came loose. It took me about 2 minutes to put it back together again; it came off the metal sides. And it looks like those clips that hold it on are going to be completely inadequate, and I expect that we're going to have some trouble with it all day today. We ought to think about fixing it before next time.

Roger, Al. We copy that. Do you think once you put a little weight in it, she'll hold better?

I don't know; they don't - the - they don't seem to have a lot of friction on the sides there, and the bag just floats around it. It needs to be more firmly attached some way.

Okay.

Roger.

Al?

Yes, sir.

Where are you?

I'm just leaving the LM.

Okay.

Boy, this handtool carrier is - is light and nice. Compared to carrying it around on Earth I think
it's going to be - We might be able to just slip it right down inside the Surveyor crater with us. Piece of cake. Okay, I see you over there; I'm on the way. Oh, don't tell me, you ding-a-ling camera. Man.

05 12 11 18 LMP I can see anything - everything from fine-grain basalt as I come running across the area here, to - coarse - a few coarse-grain ones; I see some - sort of light reddish-gray colored rock that I would call - I don't know really what I would call it; it looks almost like a granite, but, of course, it probably isn't, but it has the same sort of texture. The individual components - constituents, so to speak, are crystals, but it still has that same appearance. They'll have a chance to examine one closer.

05 12 12 04 CC Roger, Al. We copy that. And, Pete, can we give you any help with that camera?

05 12 12 07 CDR I got it going - just fine.

05 12 12 14 CC Roger.

05 12 12 15 CDR I'm taking the polarized pictures right now - but Al, when you get up to me, if you'll just stop up-Sun at 15 feet and take that shot of what I'm shooting at, 11 15, two pictures; one before, one after.

05 12 12 34 LMP Okay, let me take something out of this crater hole, Pete. It's sort of unusual; it's got a lot of those little droplets on it, those blips. But - but the - the fragments in this crater looks different from - the others. Take a couple of quick pictures, then I'll be right with you.

05 12 12 52 CDR Okay. It's all working out just fine.

05 12 12 59 LMP Get me a stereopair of this. Good. We'll use the tongs here and I'll pick it up.

05 12 13 14 LMP It's right exactly - this is a very small crater, Houston, probably about 3 feet in diameter and looks like it was made at - not very fast-moving or energetic or heavy projectile. Yet, right in
the middle of the hole is some of these glass-covered rock fragments. And, on some of the other rocks that seemed to be rested in the hole, I'm putting them all in a - sample bag I here, I mean - some of the others don't have any coating on them at all. I'm picking them up with the tongs, but I can't tell how strong they are but they don't seem - they don't seem to hold together too well; they seem kind of weak. There you go. Now, I'll head on over where Pete is.

05 12 14 09 CC  Roger, Al. We copy that. If you're going to document that, try to get some of the material around the glass as well as the glass itself.

05 12 14 14 LMP  Okay. I want to - I'll just get this as a bonus, and I want to get over here to start working with Pete as a team, here. Just didn't want to have to try to remember where that was.

05 12 14 23 CC  Roger.

05 12 14 24 CDR  You're going to get a big surprise when you look into this head crater, Al. It's a heck of a lot deeper than it looks.

05 12 14 28 LMP  Okay.

05 12 14 37 CDR  Here's a nice white, small crater - a white rim on it, about a 5-foot diameter one.

05 12 14 46 LMP  I've been concentrating, Houston, as I came walking over here to head crater, to see if there were any possible changes in either texture, slope, color, anything you could think of or anything that I could think of, that would say to me that I was walking on a different surface than I was when I started. And I can't - haven't seen a thing yet; it all looks the same - it all looks like it's covered with this - black rock.

05 12 15 17 CDR  Slow up. Don't - don't - don't kick dust in the middle of my polarized picture area, here.

05 12 15 21 LMP  Okay. I'll stop right here.
05 12 15 23 CDR  Okay. Put the tool carrier down and get - get your up-Sun pictures. You see where my footsteps are, that rock that's half buried and the two rocks that I've turned over in my footsteps?

05 12 15 33 LMP  Yes.

05 12 15 34 CDR  Okay, it's 15 feet, f:ll, two shots - Now, you're not going to get the before, unfortunately.

05 12 15 44 LMP  Okay. How about right - Better have my shadow here or over there?

05 12 15 48 CDR  No, that's the pile, right there. See where my - see where I turned over the two rocks alongside the great big rock, where my foot tracks are?

05 12 15 56 LMP  Oh yes, way down there at the end.

05 12 15 58 CDR  No, right here. I'll walk over to it.

05 12 16 02 LMP  That's a good idea.

05 12 16 04 CDR  Right straight in front of me. This rock pile, right here.

05 12 16 07 LMP  Oh, okay. Want me to shoot it from right here?

05 12 16 09 CDR  Yes, and you aren't 15 feet; back up; you're ... feet.

05 12 16 11 LMP  All right. I sure will. Fifteen feet - okay, it ought to be about f:ll.

05 12 16 35 LMP  Okay, got those two. Got a couple of pictures there, Houston. Let me tell you what my camera reading is now, and then we can try to keep up with it from time to time. Next time, I'll come over here by Pete and we'll --

05 12 16 48 CDR  Yes, Houston, I've shot three - six - nine - 12, 15 - 15 pictures.

05 12 17 03 CC  Copy 15, Pete.

05 12 17 04 CDR  Okay, and on my mark, I'm going to send a slightly smaller rock into the crater. Are you ready? Get set -
05 12 17 12 CDR           MARK.
05 12 17 14 CC            Roger. We're watching.
05 12 17 16 CDR           I didn't quite kick it hard enough; wait 1 and
                          I'll do it again.
05 12 17 23 LMP           And, Houston, that sample bag that I put the
                          fragments in that I mentioned earlier, that I
                          found in the bottom of that small crater?
05 12 17 29 CDR           MARK.
05 12 17 30 LMP           That's sample bag 1-D.
05 12 17 39 CC            Copy your mark, Al, or Pete, and 1-D on that
                          sample bag.
05 12 17 44 CDR           You know, it's a funny thing, Houston, in one-
                          sixth g, these - even though slopes are steep
                          and everything, these rocks just don't want to
                          go anywhere.
05 12 17 58 LMP           Okay, Pete. I need you to --
05 12 18 00 CC            Roger, Pete. We haven't been able to pick it up
                          on the PSE here.
05 12 18 02 CDR           Okay, that was too small a rock.
05 12 18 03 LMP           -- take the filter off the front of my camera,
                          would you?
05 12 18 06 CDR           Okay. Let me set this down.
05 12 18 07 LMP           And you might want to take the ... tools in a
                          second.
05 12 18 13 CDR           Okay. Here's your camera. Filter's off.
05 12 18 18 LMP           Okay. That's it for the filter. Goodness, that
                          thing goes.
05 12 18 28 CDR           Okay. Okay, I've got a rock over here.
05 12 18 36 LMP           Okay.
What are we supposed to get here?

We probably ought to come over here to the other side; it looks the best, and do a little trench, and compare some of the soil profiles.

Okay, they wanted it - look, I've got an area right over here that looks like a good area to work in. Okay?

These little white spatterlike craters; it looks like they're very fresh impact, like that little one right there.

Yes, that's a good idea.

Let me go over here; there's three in a row, and let's work this area a little bit, which is the corner of head crater they wanted us to work.

Okay.

And we can work right here and up to the top of it.

What - what corner is this?

We're in the northwest corner.

Okay.

Right as I indicated on the map.

Okay.

Okay. Now, I don't want to get any dirt in this thing; it's pretty interesting.

Okay.

A little secondary impact crater, huh?

Okay, you want me to step - down from here?

No, I'll - I'll get the cross-Sun.

Okay. I'll set this --
Well, you've got to, also got to be careful with this tool carrier, Houston. Did you want to put the gnomon in, Pete?

Oh, yes, let me have my tool.

Okay.

Wait 1.

Here's your — grabber.

Grabber — ... at it.

Roger, Al. We copy that comment; and, on the northwest rim, we're looking for two partial PAN's.

Okay, that's —

All right.

We'll get them — in a little —

Okay, wait, let me get my pictures, Pete.

Okay.

Let me get over here and get the gnomon and — a sample of this rock right here; this rock is very — typical of all the fragments around here.

Okay.

Hey, that's interesting; look where you kicked. Got some lighter material there.

Boy, sure did, didn't I!

Yes, that's interesting; that's the first time we've seen that.

In fact, you know what it looks like here, it looks like it may be this darker material — Well, I don't know —

I'm going to photograph that, too. Let me get —
Okay.

-- let me get this. Houston, kind of interesting here. Pete walked across one edge of the rim here. We're about - oh, 50 feet inside the - the upper rim and he happened to scrape an area there with his foot. It's a much lighter-colored soil --

Like cement.

Yes. Let me take --

Get your picture?

I got it.

Roger, Al.

Here, let me get my bag, Pete. You got to be careful with that handtool carrier; it'll fall over.

Right.

It's light and --

Sample bag number 13, okay?

Oh.

Okay. Al, let me photograph this thing, and let's trench this whole area.

Okay.

I dropped the gnomon in right here over my footsteps and the light soil versus the dark, and we can trench there --

Okay, I just put it into 3-D. In just a second.

3-D, Al.

Okay.

Let's see. Five feet, f:8, 1/250th. Okay.
05 12 22 04 LMP  Okay, and let me get a picture of what you're doing.
05 12 22 05 CDR  Get the stereopair on, I think.
05 12 22 08 LMP  Okay. You're going to trench right there, huh?
05 12 22 11 CDR  Yes, let me get my shovel.
05 12 22 14 LMP  Okay.
05 12 22 25 LMP  Okay. That's going to make an interesting shot. What can I give you, Pete.
05 12 22 31 CDR  I need the shovel.
05 12 22 32 LMP  All right. I'll hold the tool carrier while you grab at it. Got her?
05 12 22 37 CDR  Yes. Let me have the handle.
05 12 22 38 LMP  Need the handle?
05 12 22 40 CDR  Wait a minute.
05 12 22 41 LMP  Can I get it?
05 12 22 42 CDR  No.
05 12 22 43 LMP  Okay. Move over here where I can bag it better for you.
05 12 22 56 CDR  Okay.
05 12 22 57 LMP  Very interesting things about this side of the mountain - I mean, this side of the crater - is that these boulders aren't uniformly distributed around. They all seem to be over here on the western side. If you look over the eastern side or the north or south, you can see some; but there's quite a bit more over here on the west, for some reason. ... - -
05 12 23 19 CDR  Here you go, Al - quit baloneying and help me.
05 12 23 22 LMP  Okay.
Roger, Al. We copy that.

Okay.

Look at that.

Stick it right in there --

In that white soil with the brown, huh?

Yes.

There you go. Now, let me trench it.

Okay.

We get some photos of that.

Okay, look, you can see where you dug in that; there's still some under you; why don't you give me another scoop right in there?

Okay. A good idea.

There's not much in here. Okay. Where Pete digs up -- sure enough, right underneath the surface, you find some much lighter gray - Boy, I don't exactly know why at this point, and you can look around now and see several places where we've walked that the same thing's occurred. We never have seen this at all - Boy, that's going to make a good picture, Pete. Never seen this at all on the area we were before. Hey, that looks nice. There's really quite a contrast there between the --

Roger, Al. We copy that; you think it could be the Sun angle?

Listen. No, not at all. This is definitely a change to light gray as you go down, and the deeper Pete goes - he's down about 4 inches now -- it still remains this light gray. It's - this soil must be of a different makeup than that we were on outside the crater, because we have to --
05 12 24 43 CDR Say, this is different than around the spacecraft, because we've kicked up all kinds of stuff around the spacecraft and it's all the same color --

05 12 24 50 LMP Top and bottom, this is quite a bit different.

05 12 24 52 CDR But this soil looks like it --

05 12 24 56 LMP I tell you what we should do here, Pete.

05 12 24 58 CDR What?

05 12 24 59 LMP Why don't you dig deep --

05 12 25 00 CDR Deep?

05 12 25 01 LMP Yes, dig as deep as you can, then get me a sample right out of the bottom, because this will be something new. I'll put it in sample bag number 5-D.

05 12 25 13 CDR Kind of hard to get down in there --

05 12 25 15 CC Al, we copy 5-D. And would you give your location relative to the center of head crater? Specifically, are you just on the west side of it, where we have the triple crater?

05 12 25 22 LMP We aren't; we're on the northwest corner of it --

05 12 25 25 CDR Right where you told us to go, Houston.

05 12 25 29 LMP Give me another shovelful there, Pete.

05 12 25 32 CC Roger. You should be very close to that triple crater.

05 12 25 33 CDR Triple crater. Well, there's one crater right here --

05 12 25 37 LMP There's a couple of craters right over the rim here; we're sort of -- Pete's down now about --

05 12 25 44 CDR That's not a good one, Al, let me get another one --
— down about 6 inches and — looks just light gray down there. Now, in the bag, you'll find there's some darker gray material that fell in off the side.

There you go.

Hey, I want to — —

Let's throw this little rock in that I dug up from down deep.

Is that a rock?

Yes, sir.

Okay.

Get another sample bag.

All right.

That's a good one, because I don't want — —

Well, wait a minute; let me get a picture of it first.

I dug it up out of a hole. It's hard to keep this soil in the bag. Stereopair. Okay, in bag D.

There's, of course, a little of the top soil mixed in because the sides collapsed. Angle of repose is about 85 degrees, but — —

The minute you bump the side, it falls in.

— it's not cohesive at all, even though it — it seems to remain nearly vertical; I guess it's the low gravity. Hey, that's a nice rock. Pete just handed me a rock from the bottom of the hole, and it's covered with gray; I can't see anything in it other than just the gray dirt covering, soil covering. Let me get a final shot, Pete.

Okay.
Okay. That's good.

Okay. As you move off, Pete, every once in a while, I can see some white; but, most of the time - Hey, you kicked over a rock that had a white bottom - quite a bit different than the top. Right behind you; you might - you might want to take a picture of that. It's quite a bit different than those others.

Houston. You're going to have to budget our time now. How long do you want us to spend it - in head crater?

Because it looks like we could just spend all our time here if we wanted to - -

That's what's bothering me; we could do that any place right here on the Moon.

Pete, we show that you're 58 minutes into the EVA, and we'd like to get you over to bench crater, and leaving there something on the order of 1 plus 12; we can slip that a bit. So, we suggest you finish up where you are - what you're doing there at head and move on.

Okay. Al, where's the map?

Got the map right here, Pete. Let you take a look at this.

By the way, this is the smartest idea we came up with, Houston; this map just works great out here.

Okay, let me take a picture of this rock. I'm going - -

This isn't going to show much.

Let me - let me use your shovel.

All right. Now, I'm trying to find the triple craters they're referring to.

Kick it around - be right over - -
Pete, that triple crater is just south of your present position, and why don't you just go ahead and move on?

Okay. I got you.

Okay. Now, there's a good picture, Pete; let me get that one.

Okay, now, let me see which side is which.

Well, we've got it; turn over one of the rocks on the rim. The bottom part of the rock is gray, about a half of it; this rock happens to be about a 6-inch-diameter rock. I'll give you stereo of it. And the top is the same color as the --

Wait a minute. You got it in your shadow.

I do. Take another one. Pete, maybe you want it.

Even these rocks out in here - even the ones that are almost completely covered with the soil; if I look at them, I can see glints of crystals or something.

Yes, every one of them.

All right, let me have that.

There's your tube.

All right, we're going to head for bench crater.

Okay. Now, did we - We didn't get a PAN view, did we?

No, and I'm going to get it when I get to the triple craters, which is right over here.

Sounds good.

They think they're right over here; I can't see them; I've got to look over the hill.

All right.
Here they are. Ho, ho, ho.

Hey, things are quite a bit lighter gray up here on the top of the hill.

Yes.

The ... we're approaching --

Oh, look - look - at these craters, Al.

Boy.

Now, Houston, do you want head crater - from triple craters? Is that what you want or do you want the triple craters?

Pete, we suggest you just move on to bench - and a comment on that double core tube; if you find a spot that looks soft, go ahead and sink the double core tube.

We'll do it at bench. It's really a shame, Houston --

Roger.

-- we could -- we could work out here for 8 or 9 hours. The work is no strain at all.

I took three quick pictures of triple craters, Houston.

We're not going to get to that other one - bench, is it; but that looks like a real interesting area in - on the far corner of bench, Al. See all those big rocks? Some of them look as if they could be bedrock out of somewhere.

I'm kind of wondering, we're passing up these here - and they got to be bedrock from somewhere; we need to get a pretty large-sized one here, before we leave this area, Pete.

I'll tell you what we'll do is, I'll stop right here and take a PAN.
Okay.

How's that grab you?

Because these rocks obviously came out of the crater, because they're scattered more uniformly around it. There's a bunch of them on the rim and there's not many far away. We probably ought to grab a big one of them.

... 4.

We're moving - straight south now.

There's an interesting rock; let's - Hey, that's all right; let's get it.

Let me read your camera and you can read mine, if you would. Help them out a bit down there.

Just a minute. Okay, your camera right now is on 36. How about mine?

That's 36 also.

Okay, move.

Did you copy that, Houston? Every crater you come - -

Roger. We got it, Al.

--- every crater you come to and look in, you see the glass beads. Move out of your way, Pete.

Okay, now. Back to rock-taking settings, 5 feet, f:8, 1/250th. Okay. All right, Al, where do you want to grab the sample here?

Right here, I'd like to grab that rock right there, because it's got kind of a sharp edge on it and all the rest of them are - I don't know, it's got kind of a - an oblique edge on it, and you don't see many like that around here.

Which one you mean?
This one right here, this gray one. It looks a little bit different than the rest.

No, right there, a little bit further - that one right there. I'll just grab it and put it in the box, if we can pick it up.

This one, the big one?

Okay. If we can do that, we can just put it in the bag. I think that's kind of a different-looking rock. This rock is different, Houston - just in the way it's shaped, and it's partly rounded and got some oblique angles on it. Maybe under all that dirt is something a little bit different.

Okay. I got it.

Roger, Al. We copy that.

Sorry.

That's all right. All right. Picking it up; don't sweat.

Okay.

That a boy. We know you got the rock; that's what counts.

Okay.

Okay, put it in the bag.

The thing that was giving it that unusual shape was the dirt that was adhering to it (laughter). That's okay; we'll take it back with us.

Good rock.
And this is probably typical of the rocks around this crater, Houston. So, it will be a good sample for us.

I'd say in the area we're moving along now as we head south - is, what do you say, Pete, there's about 5 percent rocks?

Something like that; yes, they go anywhere from 2-1/2, 3 feet all the way down to small fragments.

That's right. There's even one by you there that's 3 feet that's ... - Look at the fillets around that rock.

Look, that's deep fillets ... - -

That's a beauty. Wait a minute; I'd better stop and get that. Hold the tongs.

Okay, let's do; let's - -

In fact, maybe we can take it on two or three sides. Have to watch - The trouble is - There you go; that's a - that's a good rock. Hey, look at the pits in it, too. That's obviously been struck a lot by - meteoroids; this is going to be a good rock, Houston. It's about 3 feet in diameter, about 2 feet thick - -

Got to back around it.

- - well-rounded, got a lot of surface pits in it. I can see the glitter -

I got to back off to 15 feet on this one.

Okay.

Get a good stereopair.

Okay.

Don't want to fall down in the crater behind me there; wait a minute.
05 12 35 49 LMP  Don't back up --

05 12 35 50 CC  Roger, Al. We copy that. Are you able to find any chips from that rock in the near vicinity?

05 12 35 55 LMP  This is not unlike all the other rocks around here, Houston. All the rocks are just about --

05 12 35 59 CDR  Al, did you get some off the far side - of that?

05 12 36 04 LMP  Yes, let's get that. That's a good idea. All the rocks we've been looking at, Houston, in this area, seem to be the same. They seem to have a - The rock has got dirt built up on all sides of it, all directions.

05 12 36 16 CDR  Sure does; looks about equal too, doesn't it?

05 12 36 18 LMP  It looks about equal; that's right. Very interesting. I don't know what the means of transport, but it's - it's just built up around it.

05 12 36 26 CDR  Here's something here. Go ahead. I want to look here, for a second.

05 12 36 34 LMP  If you look real closely at the rock, the surface of it is coarse pitted and there's some pits that are maybe even up to three-eighths of an inch in diameter on it; however, most of them are small. It doesn't look like a basalt, although the grains are too small for me to see anything - identify any specific one. Some of the pits have glass in it, which is not too surprising; and many of them don't. That's about all we can say about that rock, Houston, and that's typical of the - of the ones in this area.

05 12 37 16 CC  Roger, Al. Could you give us a sample bag number and then press on?

05 12 37 18 LMP  Okay. Well, we didn't take a sample there. The couple that we did take a sample of previously are the same types, so the last couple of samples have been of the same type rocks that we're discussing.
Okay, Houston, I'm coming up on bench crater right now. I loped off and left Al. And I'll get you a PAN in bench crater. This looks like a very interesting crater; it's different. Oh, and I see some really different rocks - a big one. Hey, that looks like bedrock. Gee, what a crater. Wow. Oh, boy. Hey, Al, look at - Come on over here.

I'm coming.

Ought to get some of this. Let me get some cans in there.

Sounds interesting, Al. And, Pete, sounds as though you're getting down to bedrock. Is that affirm?

Yes. They got to be bedrock, and this one in the bottom is - As a matter of fact ---

Boy, there's some big fragments around here.

-- get the pictures. It looks to me like stuff is melted in the bottom of it. I can't swear that, but I'll get you some pictures. Starting right now. f:8 - B - I - fix. Okay. Let me go over on the other - little bit here. Get you a good PAN.

Yes. This rock looks pretty much the same from a distance, Houston.

Yes, there's --

Soil.

-- we kicked out of this crater.

I'm just sorry you guys --

Beautiful!

-- aren't all here.

What a fantastic sight. Al, look in the bottom of that crater.

Hey, look at that.
Do you think that stuff melted or what? What's that look like to you?

Well, it looks to me - Those rocks look - What it looks to me like is, we've got one of those central - little bitty central peaks, you know - little rebound there, like the - -

Yes. But don't they look melted on the top? Don't they look like they've been - they were molten? They're not - they're not completely jagged.

No, they're not; it's hard to tell. I noticed when I was looking at that rock back there, up real close, that it had been hit by meteoroids so much, I guess, it had given it a rounded appearance, something like those in the hole, except there's a couple over there, like you say, that don't look that way. We ought to grab one of these pieces of - -

-- me, I want to cover the ground.

Okay. I'm going to beat your ...

You can baloney about it all day long in the LRL; the name of the game is to get the business done.

Okay.

One potato - ... potatoes; there's another one.

All right.

Look at that baby; that rock looks a little different.

Okay. I don't think - don't think it's going to fit. Let's put it in one of these bags. It'll fit in there, Pete.

Okay.

It's going to go in sample bag ... 4. I think it's - -
Come here, you pesky booger. C-4. It might fit in there.

Ch, it won't fit in there, Pete; that box is too big.

Let's just put it in here, and we got a nice picture of it, so we can tell where it's from --

That's a super rock.

-- why don't you pick up two or three others - little ones, and put them in 64 here, from that same area? Here, all this - all this stuff is from head crater --

Copy. Sample 64.

-- from -- ... rock. Get some here that we took the picture of.

Yes. Wait a minute.

Okay.

Yes, I don't think I got that in the picture.

Okay. May not have.

Hey, you notice that underneath this soil on the rim, too, it's the light gray.

Looks. See that stuff over - Let's go over to that corner and try to get a - break off a piece of that big rock, huh?

That's a good idea.

Looks like bedrock to me.

Let's do that. Okay, I'm putting 64 in there, Houston. There are a couple of small rocks that we just picked up from the area we've been discussing. It doesn't -- I don't think they appeared in the photo, but that won't make any difference. It's just typical of the other rocks around here.
05 12 41 43  CDR  Holy Christmas! What's this? Look at this, Al. We're kicking up the same sort of light gray.

05 12 41 50  LMP  Apparently, on the rims here, you get that light gray, out in the --

05 12 41 57  CDR  No, no, look at this stuff.

05 12 41 59  LMP  Hey, that's interesting.

05 12 42 00  CDR  What do you suppose that is?

05 12 42 02  LMP  Hey, we can't -- Here's something interesting, Houston. Hey, it looks like a surface -- What we got is what looks like kind of a semiburied rock. Hey, there's a small piece of it over there to the left. See it, Pete? We'll be able to catch it and put it in the bag.

05 12 42 13  CDR  Yes.

05 12 42 14  LMP  See that over there?

05 12 42 15  CDR  Yes.

05 12 42 16  LMP  What it looks like is a -- a buried rock, not unlike the others around here, except it appears to have some sort of coating on it that's very iridescent. A lot of crystals shining in it --

05 12 42 27  CDR  I'll tell you what's happened is it -- it -- it's been laying in the ground and it's been hit by another fragment.

05 12 42 32  LMP  Think so?

05 12 42 33  CDR  Yes. Look at the glass beads, too. They're all over the place.

05 12 42 37  LMP  I know.

05 12 42 38  CDR  Okay, you want to -- you want to catch that --

05 12 42 40  LMP  Yes --

05 12 42 41  CDR  -- piece over there and I'll put it --
Yes, let me get the - let me get the - the sample of it.

Okay.

All right.

Sample in sample bag ... - the numbers.

Copy, 7. And would you go ahead and give us some picture numbers, also?

Okay. We'll give you some in just a minute. Pete's picking up a small piece of this rock. Maybe you could get a piece that's fractured right off the middle.

That's what I wanted to do.

Okay. Let me get out of your way so you can see it. Let me hand you the scoop - There it is, right there. Okay.

It's got an interesting coating on it; it's different from what we've seen. Maybe this is more newly exposed - struck ...

Is that all you want to put in that bag?

Listen. Hand me the scoop --

Okay.

- - let me get some of those glass beads and stuff there --

All right. Let me get you the scoop.

Okay. How long have we been going, Houston?

Got it, Pete. 1 plus 15.

No, more than that.

Pete, we show you're 1 plus 14 into the EVA, and we'd like you to move on from this crater at about 1 plus 27. If you could, then, go on down and take a look at the bedrock on the bench.
Hey, I - I'd better not put that in there; that's what we wanted to show, was the - -
Okay.
Let me get you another sample bag.
I hate to try and get down to the bottom of this fellow; it's awful steep.
Yes, I don't think we want to do that.
In fact, I couldn't get down in there.
Let's forget that - -
Okay. Then hold off on that; don't go ahead.
But - but - but I'm going to get you -
Negative on the request.
-- We're trying to get you some of the bedrock; it looks like it's up in the lip here. All of it looks the same - on the edge, Houston.
I'm working on it; I'm working on it.
It's 8-D.
Ridiculous, Pete!
What happened to 1, 2, 3, 4, 5?
(Laughter) Catch you another one, okay? What we're putting in here now, Houston, is some soil that's right next to the rock that we previously described; in fact, Pete's got a nice fragment of that rock that's going to end up in this bag, too. Oh, catch that one.
Oh - ooo.
That's a beauty. That thing is barely - a weak - it fractures right off - -

(Laughter)
You've got to get some control there, babe; you're overpowering it. This one-sixth g up here, Houston; you lift something up in your scoop; and, when you stop the scoop, it just keeps going up in the air.

I'll tong it (laughter) if I can't do it the other way.

Looked good, though. Okay. Put that in the bag. There you go.

We need to put more samples per - in the bag.

And they're saying they can't hardly use those little ones.

They won't fit in it any bigger.

Here, I'll get it.

Okay.

Thank you. Okay?

Okay. Let's go over here and get some of this good rock. Like bedrock to me.

Okay.

Looks a lot like the fragments we've been seeing laying all over the place, but this stuff obviously - I'll bet you we have a total of about 3 pounds of rocks right now.

Okay. I'm with you.

Okay. We're going to have to grab some bigger ... better ones.

Got to dip down in the side of the crater there; see how it is going up and down --

Yes - it would be - down --

Boy, this is interesting here; I want to get this area right here and see if I can't sample it --
Good move.

-- if I don't fall down in the crater. Go. That's a boy. Well, this is different; look at this, Al; this is different; we'll get some of this.

Okay.

Al, Houston. Over.

Go ahead, Houston.

Al, we'd like you to go to intermediate flow for a minute and a half. We'll give you a call.

Okay. What's the problem?

We're looking at a slightly lower than nominal feedwater pressure.

Okay. Been cooling real fine. Look at the glass all over those rocks.

Yes. I need to -

I want to bring this back; look at it.

Okay.

Here, let me put this - put that in there.

If you fall, it's going to fall.

There you go.

Hold it.

Huh?

Let me get up here. Okay?

Watch it - it - You're going to -

Okay. Now, you're going to - I'm going to get a bunch of these.
Let's do; let's get a bunch of them and then they'll - have any rocks to bring back.

Doing the best I can.

There you go; there's a good one. Put that thing in here.

Oh!

Except I'm closing the bag, but we'll make it work.

I had to take that big piece right there. ... of it got spattered glass or something all over it.

Let's take it. Why don't we take a big piece of it? And - sample bag - what's wrong with these sample bags, whether they're the - the round ones, or the square ones, or the flat ones, they're all the same size. What you need are sample bags - little ones for these and some big ones for the bigger rocks. Okay, 9-B is the sample we just picked up and described, Houston.

Okay. Put this right in here, Pete.

No. Wait a minute; here's a better one.

Okay. Now, we are working on sample bag - 10-B.

10-B. Wait for me.

Roger. Copy 10-B; and, on your way out, would you get that partial PAN with a 75-foot base line?

We'll sure do that, Houston --

I already got the PAN.

Well, Pete says he's already got it.

Got a stereo partial PAN. Okay?

Roger.

Okay. That's a good rock, and that fills that one up.
Okay, Pete, what's your next pleasure?

I don't know. What do you think, Houston?

You're looking in good shape. You can press on along the traverse over to sharp crater.

Okay.

Why don't you take your - Oh, you already got a snapshot of this, didn't you, Pete?

Wait, wait - Sharp crater, that's funny; I can't locate it.

Here, let me - let me - show you the map, again.

Pete, from your present position, that's about 400 feet southwest.

Nice one, 400 feet south -

-- Al, it's got to be over that hill, right there.

About right there.

Right here.

Okay. Let's try it.

400 feet southwest.

All right. Now, we want to get the core tube and that gas sample and a bunch of good things, right, Houston?

That's affirmative, Pete. All those good things at sharp crater.

Got to find it first.

Oh, man, I got to just --

Al, you can go ahead and put that diverter valve to your choice. Your feedwater pressure's holding even; looks as though it's working well. It's slightly lower than nominal.
Okay, Houston.

Sharp crater, where are you?

Got it pinpointed, Pete?

No. I can't find it.

Well, we're going in about the right direction.

There's one right over here to - kind of more to your right. Trouble is, I'm looking down zero phase, you know, and that's - There it is. That's got to be it, right there.

Hey, I see it.

Boy, there's big fragments out here.

You can say that again.

Have you got the shovel?

I sure do.

Good boy. No, that's not it either.

Why don't we stop here and look at the chart a little bit more closely?

Man, does that LM look small back there. I'll tell you what. I'd better get a tie anyhow. Look at the chart.

Okay.

Okay.

Okay.

Roger. Are you going to give us a back-side survey at that point, Pete?

Yes. I'll make it a full PAN. So darn far out, I might as well.
Okay. A full PAN over when you get to sharp. We show you are 1 plus 23 into the EVA, and we're looking to leave sharp crater around 1 plus 51, so you got lots of time.

We got to find sharp crater first.

Pete, I kind of agree with you; where is it?

I don't know. We should be right here. I got a - How big is sharp crater?

Looks pretty small. It looks to me to be about 30 meters.

Okay. I got it. It's right here in front of me.

Okay?

Yes. That's it.

Okay. Load box - ...

This has got to be sharp crater right here. Let's - We'll drive that double core tube in there.

All right.

Yes. This has a nice white rim - a white rim on it. In fact, the rim of this looks pretty much like the area we kicked over on the previous craters. I'm not sure this is sharp crater, but it's - Let's use it anyway, because it's the only one out here.

I know. I can see - nothing out here. Darnedest thing I've ever saw.

We're estimating a diameter of sharp crater, Pete, for about 40 feet.

40 feet, huh?

Al, this may be it!

This is it - it's got to be it. It's got a nice raised rim on it.
05 12 54 11 CDR Yes. Look at that.
05 12 54 12 LMP It's raised up about - What do you say, 2 feet? This is the same color as all that subsurface material.
05 12 54 25 CDR It's awful soft in here; watch it.
05 12 54 27 LMP Okay.
05 12 54 28 CDR Holy Christmas! Look at the bottom of that.
05 12 54 29 LMP Say, you know something, Houston?
05 12 54 31 CDR Hey, Houston. This crater looks like - -
05 12 54 34 CC Go ahead, Pete.
05 12 54 37 CDR - - blast effect coming out of it. Looks like it's got blast effects radial all around. This has got to be fairly fresh to the - Look at that, Al. Isn't that neat? I - we might get some pictures of that.
05 12 54 50 LMP Okay.
05 12 54 51 CDR I don't know what to set it on - 74, I guess. We're not that far away.
05 12 54 54 LMP Boy, the - the rim is soft here, isn't it?
05 12 54 57 CDR Sure is.
05 12 54 58 LMP Quite a bit softer than the others. We --
05 12 54 59 CDR But look at the radial spray pattern. Look at that. I guess I'm supposed to drive the what - double core tube here or something?
05 12 55 07 LMP Yes. Set that baby up. Look at that - skip.
05 12 55 10 CDR We got to dig a trench? Gas sample, we're out --
05 12 55 16 CC Al, we'd like to get the trench site sample there, and you can hold off on that double core tube until you get over to halo crater.
Okay. Good. We're supposed to look west for Copernican rays here, too.

Houston, there's no way to tell the difference - from that that was there when - I mean, right on the surface before the crater was formed. There's no - there's no differentiation at all.

Let's see. Which sample do you want now?

That's the - deep trench -

Al, we're looking for the trench site sample. That includes your environmental sample of trench and the gas analyses you can put in there, too.

Okay. We'll do the whole smash here for you.

You want it right in the crater rim?

That's what it says.

Okay. I get it. That's good.

Okay, let me get out -

That's affirmative. That would be perhaps the easiest and best place to do it, and you can get that one core tube down in the bottom of the trench.

Yes, yes, yes.

Okay. Pete, before you do that, help - you're going to have to lift this up so that I can take the sample out.

Wait 1. Okay, I'll be right with you.

Okay.

You going to do it right there?

Yes. Lift it up and I'll reach in there and grab the - put the - This will be the one for the soil here.
Hey, one thing I've noticed, Houston, carrying the tools and but although your gloves you don't feel any of the temperature here. Turns out nice and bright, but it's nice and cool in here, except when you're carrying something metal, like the handtool carrier or the shovel or something. Then your hand starts to get warm.

Could you - could you get out of the -

Yes.

Could you just slide a little bit?

Okay. Let me slide right over here. That's a new one.

Oh, wait a minute. I've got to do it over here.

Hey, Houston? Did you take a picture before, Al?

Pete, go ahead.

No.

Oh. No - noth - nothing, Houston; we're okay.

I'll take one right now, Pete.

Good spot right there, I believe.

Okay. Go ahead, Pete.

Dig in that stuff.

Wow!

You could drive three core tubes down there.

You sure could; it's soft.

Yes. Down about 8 inches.

Yes. Pete's digging in the - digging a nice clean trench.

Wait, wait, wait, wait. Let me get the trench pictures.
Okay.

And I'm in the wrong setting as usual

Okay, Al. Could we have some numbers along with those pictures?

Okay. We'll have to give them to you, Houston. We've been delinquent there. Fine gray. Very fine soil here.

Okay, Al. Okay. I'm ready to - take - take - take a look at my - What's the number?

Okay. You're on number 105.

Ow.
05 12 58 51  LMP  That's okay. Well, I'll trade cameras with you because you've been ..., okay?
05 12 58 54  CDR  Okay.
05 12 58 56  LMP  All right. Now what do you want to - want to do? Fill that with dirt and - and rocks?
05 12 59 00  CDR  We sure do.
05 12 59 01  LMP  Huh?
05 12 59 02  CDR  Fill the big container with dirt.
05 12 59 06  LMP  Okay.
05 12 59 10  CDR  Be careful now --
05 12 59 12  CC  Pete, we copy you're on 105.
05 12 59 13  LMP  Wait a minute, wait. The tools didn't go in.
05 12 59 20  CDR  That's okay.
05 12 59 21  LMP  That stuff is really funny. Now, I can't see the trench and I know you can't.
05 12 59 26  CDR  That's - that a boy. Yes. Let's get organized. Okay?
05 12 59 30  LMP  Yes.
05 12 59 31  CDR  And when you get it in there, try to tap it; maybe it will come out --
05 12 59 33  LMP  You got to come - got to come this way.
05 12 59 34  CDR  Okay.
05 12 59 36  LMP  See, what's happening is my arm is being turned by the cables. There.
05 12 59 39  CDR  There.
05 12 59 42  LMP  Maybe you could grab the handles closer to the thingamajig there --
05 12 59 47  CDR  Yes.
05 12 59 48  LMP  -- when you lift it up. Okay. We need some more. There you go. Wait a minute.
05 12 59 53  CDR  There; that's the game.
05 12 59 54  LMP  Wait a minute.
05 12 59 55  CDR  That's the game.
05 12 59 57  LMP  Yes, lost half of it that way.
05 13 00 03  CDR  Well, you still need some more - there; one more scoop ought to do it, though. Ah, that's soft (laughter).
05 13 00 10  LMP  Watch yourself; you're getting close to the crater.
05 13 00 14  CDR  (Laughter)
05 13 00 15  LMP  You get about 10 percent in there --
05 13 00 17  CDR  ... now?
05 13 00 18  LMP  Want to do more, or is that good?
05 13 00 19  CDR  Okay (laughter).
05 13 00 20  LMP  One more and you'll make it.
05 13 00 23  CDR  (Laughter)
05 13 00 32  LMP  That soil - I'll just have to - There isn't anything holding it together. It takes me back in my childhood when I just - you know, you wanted to fling things in every direction (laughter).
05 13 00 44  CDR  Okay, that's it. Bag's full. Now, let me put the lid on.
05 13 00 49  CDR  I'm sorry, but I (laughter) dropped this ... for the core tube.
05 13 00 50  LMP  Okay. Can I help you with that? Wait, wait, wait, wait.
05 13 00 51 CDR  Yes. Why don't you? I'll hold this and you get the lid.

05 13 00 58 CDR  Right here.

05 13 00 59 LMP  Okay.

05 13 01 02 CDR  Let go. I got it. Okay, you put the lid on.

05 13 01 05 LMP  All right. Here's the lid.

05 13 01 08 CDR  Boy.

05 13 01 10 LMP  Right on the top. Houston, this dirt came from about 8 inches down. Wait a minute--

05 13 01 22 CC  Copied. Eight inches down, and what's the sample bag number on that?

05 13 01 24 LMP  This is the deep trench sample in the - Doesn't fit right there - All right - Okay, - Okay, on this? Now, lower it.

05 13 01 43 CDR  Isn't that ridiculous?

05 13 01 44 LMP  Done this a million times.

05 13 01 47 CDR  I'm just jamming on it. It's not sliding.

05 13 01 52 LMP  I just made ..., I know. Now, you hold it nice and tight.

05 13 01 55 CDR  I'll tell you what's the matter, that thing - you're getting - getting friction. Wait, wait. Hold her tight.

05 13 02 03 LMP  Here, I'll get it.

05 13 02 04 CDR  Here you go.

05 13 02 07 LMP  You got it.

05 13 02 08 CDR  No oil. Suppose you're getting some vacuum welding? Huh?

05 13 02 15 LMP  No. That's okay.
That's it. Put her down tight.
A little bit more.
Go ahead. That's a boy.
Will you snap the top on?
Okay.
That's a good top in that one. Hold on. Don't let go. Good.
Okay. Now, you need a core tube in the bottom of that trench. Is that right, Houston? Okay. The tube's here --
That's affirmative. And, Al, when you get a chance, can we get your photo numbers?
That's right - 50. And this is core tube number 2.
Core tube 2 and I'll need the - There you go. Ought to be a good place, Pete. Relatively fresh stuff here.
Yes. You'd better believe it. Very good. Okay.
This kind of ..., you could almost drive it without a hammer; but, if you'll hand it to me, I'll get --
Just a second. I want to take a couple more shots of this before we leave.
There. Okay.
They're all in. I'll get the pictures.
All right.
It's driving in real easy, Houston.
Go on; just drive her all the way. I can't lean down too far now.
Roger.
And we're driving it all the way in pretty easy.

That a boy. Wait l. Stop. That's it.

Okay. Just a second; let's put this up. Let me take a picture of it, Pete - make sure we got it documented.

Let's do.

There's the stereopictures.

Okay.

All right. This dirt's gotten on my camera and I can't see the settings anymore; I'm going to have to do something about that.

Okay. You ready to put the top on this core tube?

You'd better believe it.

Okay. Here we come. I hope that soil stays in there.

See if it did.

Probably did because it stayed in your scoop so well.

You'd better believe it. It's full.

Okay.

Come over here with it.

All right. There you go. Better.

Good sample.

Yes. It is. A good sample.

There you go.

Ah, got the cap on the can.
<table>
<thead>
<tr>
<th>Time</th>
<th>Caller</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 13 05 04</td>
<td>CDR</td>
<td>That a boy.</td>
</tr>
<tr>
<td>05 13 05 05</td>
<td>LMP</td>
<td>Okay. Just a minute. Hunch. Got it.</td>
</tr>
<tr>
<td>05 13 05 10</td>
<td>CDR</td>
<td>Careful --</td>
</tr>
<tr>
<td>05 13 05 11</td>
<td>LMP</td>
<td>Okay?</td>
</tr>
<tr>
<td>05 13 05 12</td>
<td>CDR</td>
<td>-- put the scoop back on. All right? And I'll stow it.</td>
</tr>
<tr>
<td>05 13 05 14</td>
<td>CDR</td>
<td>Okay, Houston. What else do you want here? Just a little environmental sample?</td>
</tr>
<tr>
<td>05 13 05 21</td>
<td>CC</td>
<td>Okay. We show you should have gotten in the trench site sample, the core tube samples from the end - from the bottom, and also the gas analysis sample.</td>
</tr>
<tr>
<td>04 13 05 29</td>
<td>LMP</td>
<td>Okay. We need some little rock fragments from here, Pete. You'll have to hold up the bag so I can reach it.</td>
</tr>
<tr>
<td>05 13 05 36</td>
<td>CDR</td>
<td>Okay. Just a second.</td>
</tr>
<tr>
<td>05 13 05 37</td>
<td>CC</td>
<td>Roger. That's surface rock fragments.</td>
</tr>
<tr>
<td>05 13 05 38</td>
<td>CDR</td>
<td>Yes. We're going - going to get it; hold the phone.</td>
</tr>
<tr>
<td>05 13 05 39</td>
<td>LMP</td>
<td>Better find it first. Do you know where the ... went?</td>
</tr>
<tr>
<td>05 13 05 47</td>
<td>CDR</td>
<td>... just a little ...</td>
</tr>
<tr>
<td>05 13 06 00</td>
<td>LMP</td>
<td>I'll move it around and see if you see it.</td>
</tr>
<tr>
<td>05 13 06 03</td>
<td>CDR</td>
<td>Yes. Yes. Stick your hand straight down. Towards your knee; that a boy; you ought to have it.</td>
</tr>
<tr>
<td>05 13 06 09</td>
<td>LMP</td>
<td>Got it; I almost got it.</td>
</tr>
<tr>
<td>05 13 06 12</td>
<td>CDR</td>
<td>Some little rocks in here --</td>
</tr>
<tr>
<td>05 13 06 13</td>
<td>LMP</td>
<td>Okay, just little rocks. ... now, push it.</td>
</tr>
</tbody>
</table>
Roger. Copy. You got some rocks and the gas analysis and would also confirm that you've gotten the environmental sample?

Pete, have you got the --

We got the environmental sample, we got the trench and core tube, and I'm trying to find a little rock. Little rock? There - there's a lot --

There's a neat one. There it is right there.

Ho-ho, just right for that little can.

Give me a few.

Thing has shrunk.

Here's a couple of nice ones right here, Pete.

Where?

See them?

Al, your PLSS feedwater is back up to nominal and all looks good.

Okay. Thank you very much, Houston. See those bright shiny ones there?

Yes, yes, yes, yes.

Wait. Let me get a shot of them. Just move - just a second, Pete.

Okay.

Okay. Got a picture of them.

Careful. These - there. How about those right - right there? There. Right - there. See them shine?

The little ones?
No, no. Move over this way. This way. Up - you're near about - right there.

No. Hey, that's a neat - Oh, that's glass; look at that.

Right next to it.

Yes, here. One at a time. Be a good sample for them.

And that piece right next to it, there.

Okay.

Houston, how far are we from the LM?

(Laughter)

Stand by.

... tricky; wish we had -

(Laughter)

Hey, we need some more, Pete. Give me a bigger rock. There's not enough in there to do any --

(Laughter) Hey, come on, I'm getting tired of picking up those little things.

There's nothing in there.

I can't - Where is my stupid tool? There it is.

Get a big one. There's one right there.

Get a big what? Here, this one?

Yes.

I don't think that will fit.

Let's try it.

No, that won't --
No - ...

There's a good one.

Pete and Al, we show you 1200 feet from the LM.

Okay. Come on, Al, we're wasting time.

There you go.

Pete, as soon as you finish up there, you can head on back toward the east, towards halo crater. No need to go any further west.

Got it, Pete?

Yes. Wait; let go a minute.

I'm with you, Houston.

Hey, good show, Pete; good turning.

There you go. The front of my lens is clean - relatively speaking. Nothing else is.

Okay. Want me to put that up?

Yes.

Okay. We got it.

Okay. Give me one gnomon and my shovel.

Here's your shovel.

Head for halo crater.

Okay, Pete. We'll give you a radar vector on this one.

That's good.

If you'll go over - just directly east of bench crater, and you can continue on east until you're just about directly opposite the LM. And then a couple of more steps ought to take you right to halo crater.
Sounds like a pretty good vector. That also says that we're running right into the Sun. Does that agree with you?

That's affirmative. You will be running right into the Sun; and directly at your 9 o'clock position, you'll see the LM; a couple of more steps and you'll be right there.

I've got the LM in sight to my 10 o'clock. You know what I feel like, Al?

What?

Did you ever see those pictures of giraffes running in slow motion?

That's what I feel like.

-- That's exactly what I feel like (laughter).

Say, would you giraffes give us some comment on your boot penetration as you move across there, what you're doing now, and what you had back there at sharp crater?

Oh, it's much firmer here. We don't sink in anywhere near as much. Now, I'm crossing some of my own tracks.

Yes.

The toes sink in a bit, Pete, as you push off. You land flat-footed so your heels don't sink in; but, as you push off with your toes, they sink in down about 3 inches. Your heels are only sunk in -- perhaps an eighth of an inch. Also, right as you kick off on your toe --

Roger. Thank you, Al.

-- Every time he lands he sends a -- little particles spraying out ahead of him and beside him and everywhere else, and they go out to distances maybe -- maybe 2 feet to 3 feet around him.
Okay. We're back at bench crater. Now, have we gone too close towards the LM?

Going on the south side of bench crater, Houston.

Okay. Now, if you'll just go directly to the east of the center of bench crater and then continue directly east right into the Sun; and then at 9 o'clock, you'll see the LM, and a couple of more steps and you'll be there.

Okay.

I've got the decided feeling I'm going to sleep tonight.

Pete, the crater you're looking for, halo crater, is just about the same size as sharp crater and should resemble it.

I think I have it in sight, but I'm not sure. There's a couple of them here. I'll tell you what I'm going to do, Houston; I'm going to take an EMU break. How you doing, Al?

Okay.

Pete, the dimension on halo crater is about 20 feet, so that would make it half of what you saw at sharp.

Okay. Now, halo. I wonder if I'm standing - You suppose this is it, Al?

Well, it doesn't have any halo around it.

Yes, I know. But you never can tell from here.

You can look at the map when you get here.

Tell you one thing I'd go for is a good drink of ice water.

Quit thinking that. Let me look in the map, Pete.

Okay.

I can't imagine them seeing this one from --
Pete and Al, can we have an EMU check?

You sure could.

And one way to locate it, also, is that it should be right on the rim of Surveyor crater, and you ought to see Surveyor off directly to the north-east.

Okay. I - I - I know where we are. An EMU check, mine reads about 55 percent O₂, Houston.

Mine reads 55 O₂ also, Houston. Just beautiful --

Copy. Fifty-five both.

Round glass ball they got to have, Al. Quarter of an inch.

And the sample bag.

Coming. Coming.

Look at that.

Okay; just a second. First time I’ve worked up a heart rate, I think.

Okay.

This is sample bag 11-D.

I didn't take a picture. I just wanted to --

Okay. Watch that crater behind you; don't step back.

Wait a minute.

This is glass beads.

I know. I was thinking of this. We got a total now of about 5 pounds of rocks.

Okay.
05 13 14 55 LMP I'd hate to – I'd hate to have us get back to the LM and then have to fill it up around here again.

05 13 15 00 CDR Ah, we're going to the Surveyor crater.

05 13 15 03 LMP Okay.

05 13 15 04 CDR ... get to the bottom of that baby.

05 13 15 06 LMP Why don't you take a rest here?

05 13 15 07 CDR Yes.

05 13 15 08 LMP Funny. Do – do your hands get hot holding that shovel?

05 13 15 12 CDR My hands just get hot, period. I guess – I don't know whether it is the shovel or what.

05 13 15 16 LMP You know, as long as it – like now, mine are cool. But the minute I start carrying this tool carrier, they start warming up. Wouldn't think the thing would be that hot.

05 13 15 23 CDR Yes. Yes – I – I'll tell you what – Let's see, we're cross-Sun, right? Look over here at me and smile.

05 13 15 30 LMP Okay. Have a picture. You're right there by a crater.

05 13 15 34 CDR There's the LM. Right in the background. Great. There you go.

05 13 15 47 CDR All right. Let's – let's ease off at a nice –

05 13 15 49 LMP Okay.

05 13 15 50 CDR – – at a slower pace. Just like you're going now. I think this is halo crater right up here in front of us.

05 13 16 09 LMP Hey, Ed, you might tell Fred Haise he ought to quit working on running and start working on holding things in his hands – –

CONFIDENTIAL
There he is.

My legs don't get a bit tired, but your hands get tired carrying these tools, particularly the handtool carrier.

Roger, Al. Sure will.

Yes. You wouldn't - -

I'm sure he's listening.

Yes, I think that's - that's funny; it - you wouldn't think it that way.

Tell Jim Lovell to practice digging (laughter).

Boy, look at - look at all the texturing - Look here, Pete; now, we are crossing across something that's got a completely different texture than what we have been on.

You're right.

Look at all - looky here. We got all sorts of --

This is halo - Let's take some pictures here.

This - We've run across a sort of a textural contact. We're suddenly on a - on an area that's quite - not so smooth; it's got dimples and wrinkles in it. You want me to take some pictures or what, Pete?

Yes. Why don't you come up here - -

Okay.

-- and we'll take a couple of good dirt bag samples of this stuff.

Okay.

I'll get the --
It's interesting. You know, I think this looks like that material that we talked about the first day in front of the LM. Maybe it runs past the LM down into this area. But it's sure different than where we've been. It - like it's more - the material is more cohesive and forms clumps, instead of being so nice and smooth. ... around behind you.

I was waiting for the gnomon to damp out, but --

Okay. Right here. Good shot here, Pete.

I wanted to get my foot - footprints in it too, so they could see that.

Okay.

Uh-oh.

You know, I think I'll take some a little further away. Back up a little, and shoot a 15-foot one, if it's okay.

Yes. I'm going to dig.

All right. I'll be back to collect in just a second; let me get this 15 footer.

It's halo crater. It has slightly big - Yes.

Hey, I'm shooting about four here. Okay. Quite interesting that this --

Just get some sample bags and we'll --

Okay, Pete.

-- scoop this stuff.

Okay.

Let me - Boy, it sure is fine; it's kind of like over at the other - at sharp crater.

Yes. Looks the same, except on the surface it just seems --
Except it looks almost finer.

Yes.

Wait a minute and I'll get you another bag --

It's funny though. If you saw this on Earth, you'd think it was a - a real soft dirt that had just been rained on recently.

... 

Not hard rain, but just a sprinkle, so that the droplets --

There you go.

Now, that's a good sample bag full.

That's 12-D, Houston, the sample bag number --

Is halo crater a shallow crater, Houston?

Copy. 12-D.

With a couple or three dimple craters in the south side of it?

Stand by, Pete.

We can collect a rock while we wait, Pete.

Well, I - Well, look; I think this is halo crater right here --

All right. Let's ease over there.

-- and let's go get some rocks from it and everything; we're seeing it right; we - we - we're - We've actually got the soil sample from part of it.

Okay.

But this isn't 20 feet in diameter. Is it right on the rim of the Surveyor crater, Houston?
That's affirmative; and, from your comments on the three dimples, we show that you're there.

Okay. What do you want in it?

It's a 20-foot-diameter crater?

About 20.

We'd like to get the PAN and a double core tube.

I can't believe we're at the right place.

I - I'm not sure that we're at the right place, either. Let me look at the top of this hill, here. This is Surveyor crater. Let me look at the chart.

There's a nice rock right there.

Here's Surveyor.

Let me look at the map. Not even hardly a crater worth looking at where we are.

Okay. ... crater.

Okay, Pete. It's your call there; you're the local experts. If you see a better location for that double core tube, go ahead.

Yes. We're just trying to find the right - right crater, Houston.

Hey, Pete. I think it's that area right over there -

Where?

That's the - Halo is this first one right here, the little one, and then all those others are next over, according to the chart.

Okay.

So we can just go over there and --
05 13 21 25 CDR Which one's halo? This one right here?
05 13 21 27 LMP This - no, it's right - See where I'm pointing?
05 13 21 29 CDR No.
05 13 21 30 LMP As I see it, it's that one right over there.
05 13 21 32 CDR Okay. Let's go.
05 13 21 34 LMP Okay.
05 13 21 35 CDR And I have the double core tube?
05 13 21 36 LMP All right.
05 13 21 37 CDR And you want what, Houston, a partial PAN?
05 13 21 46 CC That's affirmative.
05 13 21 47 CDR I guess we're trying to get these - -
05 13 21 49 CC We'd like a full PAN at that point, Pete.
05 13 21 53 CC And also, Al, if you could give us some sort of an estimate of how hard it is to get the core tube in. That is, what's the force you have to use; how many pounds and how much force.
05 13 21 59 LMP Sure will.
05 13 22 00 CDR Hey, look at this little neat-o crater right here. It's a good place to sample.
05 13 22 14 LMP Oh, look at all the glass in the bottom of that baby. Got a lot of that, though.
05 13 22 18 CDR Huh?
05 13 22 19 LMP Got a lot of glass.
05 13 22 20 CDR Out there?
05 13 22 21 LMP Yes.
05 13 22 22 CDR I think that's halo right there.
05 13 22 23  LMP  Which one?
05 13 22 24  CDR  The one you're looking at. Right over - it's that one - that one right there.
05 13 22 27  LMP  Too big.
05 13 22 28  CDR  Too big, huh?
05 13 22 29  LMP  Let's take this one right here.
05 13 22 32  CDR  All right. That's good. ... glass out of the bottom of this baby, don't we?
05 13 22 36  LMP  Okay.
05 13 22 44  CC   Pete and Al, could we have a readout on the cameras at this point?
05 13 22 45  LMP  Sure could. Just a second. Yes. See mine probably, Pete.
You'd better take all these pictures; I'm running out.

Well, I'd better change cameras because --

Sixty - 60 for Al.

You've got - 110. You still got plenty to go.

Hey, I - You know what's happened?

This thing hasn't been taking every picture.

Take a picture and let's see.

I - I just caught it. I - I mean, it's been doing it - intermittently.

Okay. Now, get out and make the double core tube here.

Pete, we copy 60 and 110 on the film.

That's affirm.

Here, look at the chart a minute, Pete, while --


Pete and Al, we'd like you to go ahead and get the PAN's taken on the LMP's camera. You can either have Al do the PAN's or switch cameras. Your choice.

Okay. Roger-Roger.

Okay, Pete. You'll have to unscrew - pull the pin and unscrew that if you can.

Okay.

Good luck on unscrewing it. Hey, wait. Hold it just a second.

I'll get it.
<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 13 24 32</td>
<td>LMP</td>
<td>Okay. Hey, good show.</td>
</tr>
<tr>
<td>05 13 24 37</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>05 13 24 40</td>
<td>CDR</td>
<td>Double core tube. Drive it. Give it a go.</td>
</tr>
<tr>
<td>05 13 24 45</td>
<td>LMP</td>
<td>I'm going to hand you the hammer. I'm not sure that double core tube screws on as far as it should. Try it again.</td>
</tr>
<tr>
<td>05 13 24 59</td>
<td>CC</td>
<td>Pete and Al, Houston. Be sure you give us the number of the lower core tube, please.</td>
</tr>
<tr>
<td>05 13 25 03</td>
<td>LMP</td>
<td>Okay. The lower core tube is number 3, I think. Yes.</td>
</tr>
<tr>
<td>05 13 25 07</td>
<td>CDR</td>
<td>Three?</td>
</tr>
<tr>
<td>05 13 25 08</td>
<td>LMP</td>
<td>Three, and the upper one's 1. Okay.</td>
</tr>
<tr>
<td>05 13 25 11</td>
<td>CDR</td>
<td>Ready to pound it.</td>
</tr>
<tr>
<td>05 13 25 12</td>
<td>LMP</td>
<td>Where are you going to drive it?</td>
</tr>
<tr>
<td>05 13 25 14</td>
<td>CDR</td>
<td>Where would you recommend?</td>
</tr>
<tr>
<td>05 13 25 15</td>
<td>LMP</td>
<td>Well, let's go over to this crater, right here.</td>
</tr>
<tr>
<td>05 13 25 17</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>05 13 25 21</td>
<td>LMP</td>
<td>Where it's soft around those little - craters.</td>
</tr>
<tr>
<td>05 13 25 27</td>
<td>LMP</td>
<td>About right here.</td>
</tr>
<tr>
<td>05 13 25 29</td>
<td>CDR</td>
<td>Yes.</td>
</tr>
<tr>
<td>05 13 25 31</td>
<td>LMP</td>
<td>Want to take a picture?</td>
</tr>
<tr>
<td>05 13 25 33</td>
<td>CDR</td>
<td>Yes.</td>
</tr>
<tr>
<td>05 13 25 34</td>
<td>LMP</td>
<td>I can shove it in a little - I hope this is a good soft place. It seems to be. Oh, I hit something solid there. Well, I shoved it in - I used all my weight, Houston, and shoved it in about 11 inches. Now, I'll just pound on it awhile and see what we can do. It's going in okay. Yes. It's going on down.</td>
</tr>
</tbody>
</table>
05 13 25 48 CDR Keep augering.

05 13 26 00 LMP No. We've got a good spot. I don't think this is the right place. Some of those things aren't so obvious.

05 13 26 09 CDR Got awful solid, didn't it?

05 13 26 11 LMP Oh, it's going. Let me wiggle it a bit. It's got one core tube completely in, now. Have to hit it harder.

05 13 26 29 LMP Hey, Houston. This hammer - when you hit on the side of it, like you have to do to ... it within this suit, it knocks little chips of metal off the side of the hammer. I don't think that's too good.

05 13 26 48 CC Roger, Al. Is it damaging the hammer or the core tube?

05 13 26 53 LMP I'm afraid some of the fragments will damage the suit. It's not damaging itself. You know, it's - it's just breaking the - Hey, I'm better left-handed than right. There goes another fragment. Do you see it, Pete?

05 13 27 04 CDR Yes, I'm watching.

05 13 27 09 LMP You even hit it with the front end and some of them pop off. They're flying all over the place.

05 13 27 15 CDR Okay. He's up to the bottom of the handgrip portion of the upper tube. He's really driving that baby.

05 13 27 22 LMP Look at that ham - look at that - look at that (laughter). Looks like it's got a coating over the hammer, Pete, and I'm knocking the coating. Instead of being a steel or aluminum hammer, it's - -

05 13 27 32 CDR Yes.

05 13 27 33 LMP - - some sort of coated arrangement. Beating the heck out of it, isn't it?

05 13 27 39 CC That's affirmative, Al. There is a coating on that hammer and that's probably what you're
knocking off. And also, we want to be sure to get the site there documented.

05 13 27 45 CDR We'll document it for you.
05 13 27 48 LMP Coming up.
05 13 27 49 CDR We almost got it.
05 13 27 50 LMP Ooh! Almost.
05 13 27 52 CDR Hit something solid there, didn't you?
05 13 27 54 LMP No. It's just getting down there, Pete.
05 13 27 56 CDR Hey, that baby is in the ground.
05 13 27 58 LMP We've got a double; now, the question is, can we pull it out?
05 13 28 00 CDR (Laughter)
LMP ... solid ...
05 13 28 01 CDR Let me take - let me get the down-Sun shot. I hope that's a good spot.
05 13 28 06 LMP I do, too.
05 13 28 13 CDR Ought to get some of these rocks nearby here.
05 13 28 19 LMP Come on. Let's see - 250, 11. All right.
05 13 28 30 LMP You give them that low PAN or something, so they can see where this came from. So they --
05 13 28 33 CDR You - you do it; I don't have that much film.
05 13 28 35 LMP Okay. Why don't I just trade you cameras? That's probably the smart way.
05 13 28 39 CDR All right.
05 13 28 46 LMP Hey, would you lift mine off, when you're through?
05 13 28 49 LMP Sure will.
<table>
<thead>
<tr>
<th>Time</th>
<th>Actor</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 13 28 50</td>
<td>CDR</td>
<td>I can't pull those things right. They tend to vacuum weld a little bit or something, I think.</td>
</tr>
<tr>
<td>05 13 28 57</td>
<td>CDR</td>
<td>Now, you hold that one -</td>
</tr>
<tr>
<td>05 13 28 59</td>
<td>LMP</td>
<td>Hey, that's about to come apart.</td>
</tr>
<tr>
<td>05 13 29 00</td>
<td>CDR</td>
<td>Be damned if it isn't; I'll fix it, hold the handle there. Back - ... come apart.</td>
</tr>
<tr>
<td>05 13 29 06</td>
<td>CDR</td>
<td>Whoa!</td>
</tr>
<tr>
<td>05 13 29 07</td>
<td>LMP</td>
<td>It did come apart. It did come apart.</td>
</tr>
<tr>
<td>05 13 29 09</td>
<td>LMP</td>
<td>Son of a gun.</td>
</tr>
<tr>
<td>05 13 29 11</td>
<td>CDR</td>
<td>Well, that kind of bombed out. I tell you what, the only thing we can - did it - -</td>
</tr>
<tr>
<td>05 13 29 16</td>
<td>LMP</td>
<td>It broke!</td>
</tr>
<tr>
<td>05 13 29 17</td>
<td>CDR</td>
<td>Sure did break.</td>
</tr>
<tr>
<td>05 13 29 20</td>
<td>LMP</td>
<td>Well - the nut that holds the handle of the camera on broke off; and so, the handle's free, but that's okay; we'll just carry it around.</td>
</tr>
<tr>
<td>05 13 29 24</td>
<td>CDR</td>
<td>Let me ask you a question. Is mine tight?</td>
</tr>
<tr>
<td>05 13 29 40</td>
<td>CC</td>
<td>Roger, Al. We got you. We - we understand that the nut broke, but you - The camera is still usable, right?</td>
</tr>
<tr>
<td>05 13 29 44</td>
<td>LMP</td>
<td>Yes. And your nut's loose too, Pete. Stay - stay there. Let me tighten it up for you. They work loose in one-sixth g; yet, we - we knew that; we should have - watched it more carefully.</td>
</tr>
<tr>
<td>05 13 29 50</td>
<td>CDR</td>
<td>Finished?</td>
</tr>
<tr>
<td>05 13 29 59</td>
<td>LMP</td>
<td>Can you help do that yourself?</td>
</tr>
<tr>
<td>05 13 30 02</td>
<td>CDR</td>
<td>Yes.</td>
</tr>
<tr>
<td>05 13 30 03</td>
<td>LMP</td>
<td>Because it's hard for me to do.</td>
</tr>
<tr>
<td>05 13 30 04</td>
<td>CDR</td>
<td>Yes.</td>
</tr>
</tbody>
</table>
Let me go put the hammer up and this camera somewhere and - There goes the bracket, but that's okay. Still got the camera.

But you're going to have to help me get this camera off; I can't get it off.

Okay. There's no need to get it off now.

Okay. I'll leave it on. No, I want to give it to you.

And you're going to use this one?

Al, you got to take the Surveyor pictures, so why don't I give you the camera?

Okay. That's good enough.

But it's still got 50 pictures or so. Now, watch it; make sure it takes a picture each time it turns.

Okay.

And just - Why don't you - The camera - I'll tell you what - Well, here, I'll hold it and you take this one off.

Okay. You got that camera. Take this one off. Help me take it off; now, I'll tighten the nut. And I'm going to tip it down a little bit.

Wait a minute; I'll hold that down.

There you go. Tip it - Push - push your RCU down a little bit more.

I'm trying to.

A bit more, it's almost off, Pete. Push down some more.

I can't.

There you go. Okay, now. I can tighten this thing. Yes, I'm tightening so it'll get tight. Okay. I got enough, there; that'll be enough. Drop it right there.
All right. I'll drop that one in here.

Well, why don't you --

... carry it.

That's what I'd do; carry it or something.

But - but I got too much other stuff.

I - Let me carry part of it or something. Okay. Let me go pull out the core tube.

No, I tell you what. We can always take the magazine off this and put it on the other one.

That's what we can do, I guess.

Yes. We just drop it in here.

Okay.

All right. Let's go get your core tube. I'll go get it.

Okay. You go get it. Here I'll --

Get the cap off.

Take the cap, right here.

Okay. Hey, you sure beat on it.

That's what it took to get it in the ground.

It's coming up real easy.

What?

I say it's coming up real easy.

Looked for a minute like you were going down real easy (laughter). The core tube hangs in and your feet just sink down. Okay, hold.

Hey, we made a tactical error here.

In what fashion?
I think we dropped an end of the tube we shouldn't have dropped.

No.

Yes. We got to take them apart. Remember?

Okay. Well, what we'll have to do is pick it up, right over there.

Where is it?

It's right over here.

Okay.

Hold - hold on. We'll find it.

It's right back there; it's someplace buried in the dirt. I see it. Ha, ha. Right here. Wait a minute. I'll get it with the - Here, you hold the core tube.


Where's my sample stir?

Right there. You got it, Pete. All right. You got your hose, too. Pull - There you go. Good show.

Uh-oh.

What?

Hey, this ain't going to work, gang.

Why?

Well, see the - Here, wait a minute. Reach inside the core tube. Wait. Which goes which way - There you go. Beautiful. Put that in there. You got it? You got that one? Okay?

Yes.

Boy, I drove a nice core tube in there.
Well, it doesn't look any different, though, to the eye - halfway down.

Loan me the tweezers a moment. See that cap right there? The cap right there. Okay.

Ooh. Can you haul the camera now?

Sure. I can just lift - Why don't I just lift this up?

Well, there goes the shovel, but we can get that in a minute.

Okay. That's good.

Wait.

Just a little closer?

Now, wait a - wait. Hold it right there.

Okay.

That a boy. That's the way to go.

Good show there, Commander.

Let me hold on to that thing.

Right.

Just lift it, okay? You got her?

Is this on there tight enough?

Yes.

Okay. Put the shovel back on here? I'll get it. Okay. Looks good, Pete.

Pete, we copy that you finished the core tube. Is that affirm?

Yes, sir. We got a double core tube and all put together correctly.
Very good. Well done. Have you gotten the panorama?

No, I'm going to get Al to do that right now. He's using my camera. His camera's had it. With the handle off it and everything; by the time we got done handling it, we got dirt all over the lens. We run out of film; we happen to have another magazine with us, or we could change that one --

-- Don't change that; just take that one off.

Or we could do that or --

Of course, we don't want to, but if we have to, I guess we can. Okay. Let me start this PAN.

Seventy-four.

Seventy-four it is, f:11, 250. Okay?

Okay, Houston. What else would you like here?

Okay, Pete. You're 2 hours and 7 minutes into the EVA. And we show you leaving halo at around 2:15. And now, that's for a 4-hour EVA. We've extended you 30 minutes for a total EVA of 4 hours. We'd like, before you go on, to have a good EMU check and sit down and regroup and figure out a plan of attack on the Surveyor. One thing we would like to make sure is that you remain away from directly below the Surveyor as you move up to it; that is, move up to it on one side or the other, either north or south.

Okay. We concurred with that. We were talking about it last night. We're going to approach it from the side.

Roger.

That's it, Pete; PAN's complete. Probably ought to get rocks -- one of these rocks here; just throw it in the bag --

Yes. I think we ought to.
How about - You want to get this one?

... for a sample bag.

Let's - let's sample a couple of these laying right over here.

Good idea. That a boy.

Oh, wow, my ears just came back down.

Just a second. I shouldn't have done that.

Okay. Here, take one quick picture so we can save some film.

All right. Here it goes.

Where it came from.

Okay. Just a second.

Those little holders for this - for these sample bags are ridiculous, you know. In this light gravity up here, if you put anything in the holder and move, it flips it right out of it. Come out of there, sample bag. There you go. Funny how this one - Go in there. Go in - That a boy. Give me some of that dirt around there, too, Pete. Drop it right in. This is going in sample bag 13-D, Houston. Looks pretty good, Pete.

Roger, Al.

Al, let's move up on the rim of the Surveyor crater and start getting some rocks, gnomon, - And we'll figure out - There you go.

Al, could we have some sample bag numbers while you're working along there?

Sure could. I thought I - Didn't I call out 13-D, Houston? I guess I didn't call it out loud enough. I think it was 13-D. Then, let me - I'll check the next one and if you - The next time we stop I'll tell you the next one for sure and then you'll know what it is.
Roger. Thank you, Al.

Al, look at these rocks; they look a little bit different. Let's grab some.

Yes, sir.

Look at that glass in the bottom of that one. They look like granites, don't they?

They do; they look just like granite. Here's a beauty over - Here's a beauty.

Where?

Right here. That is a nice rock.

Huh?

Right around here. Let's get this one for sure. Right there.

Okay.

Won't fit in the bag, but it's sure different. It seems to have some --

Got a big glass splotch on it.

Yes. That's a good one. That's a real good rock. Get some pictures --


That's a beauty. That gnomon doesn't really damp as fast as it should, you know, Pete? I think it does great in one g, but one-sixth g, it won't doesn't seem to damp right. Let me get the cross-Suns too. Oops, got to get over where you are.

Okay.

We will just put that in; that's a beautiful rock.

Okay. You going to scoop it up? You know, you need some tongs that will get bigger samples than we've got.
Watch that.

You know, seeing that, I just thought -

Hey, that's beautiful. It's got a lot of - Hold it!

Don't drop it.

Nearly dropped it. Tough to hold it.

Okay. Now, I want some of these granites over here - or what looks like granite.

Okay. Let's try that.

Doesn't that LM look neat, sitting on the other side of that crater?

(Laughter) Yes. It does; we ought to get a shot of that.

Yes. Get a shot of home.

Okay. Let me see, how many pictures have I got now, Pete?

143.

143, okay -

You're getting close to the end - We ought to --

Okay. That's 14-D, Houston, is the next sample bag, so the last one was 13-D. Let me take a picture quick here.

Ah-uh-ow.

Roger, Intrepid. We copy that.

Al, why don't you step across over here?

All right.

Step across over there; photograph that rock right there - Wait until I drop the gnomon in --
Okay.

-- and do it in such a manner as to get this crater that it came out of.

That's a good idea. Let me see if I can; I'll have to back -- Let me get a 15-foot shot.

Yes. That's just what I was just thinking.

15-foot.

Pete, could we have your present position?

Roger. We're -- If you were looking at the Surveyor crater and west with 12 o'clock, we're at the 9 o'clock position on the Surveyor crater.

Okay, Pete.

Roger. Copy that. Copy you're right on the rim, and we'd like to get a good EMU check and a rest here before you proceed.

That's a good idea, Houston --

Okay, Houston. That's a good idea. What -- what we're going to do is I'm getting this --

Wait -- wait 1 -- wait, Pete; I've got an idea.

What?

This rock -- might be good for 13. Let me reach back here and grab this strap.

Okay, now?

Go. Okay. Let me roll a little bit over.

That a boy. Back up. Now, if they had a strap like that, they could just hold the other guy while he leaned over and picked up a rock.

Hey, that's a --
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<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 13 44 33 CDR</td>
<td>It works pretty good. It sure saves time. Look at the sheer face on that rock, something whistled by it or something.</td>
<td></td>
</tr>
<tr>
<td>05 13 44 41 LMP</td>
<td>It's fractured a bit; it's got some - pretty interesting fracture marks on it. It also has got some - what looks like abrasion marks on it; maybe that's just hard-packed dirt. Boy, there's a lot of flashing crystals in that rock - crystal faces. It's a good rock.</td>
<td></td>
</tr>
<tr>
<td>05 13 44 59 CDR</td>
<td>Listen, I'll tell you what I recommend we do while we're taking - -</td>
<td></td>
</tr>
<tr>
<td>05 13 45 01 LMP</td>
<td>Okay. Let me get a - -</td>
<td></td>
</tr>
<tr>
<td>05 13 45 02 CDR</td>
<td>- - an EMU break.</td>
<td></td>
</tr>
<tr>
<td>05 13 45 03 LMP</td>
<td>Okay. Let me take the - the picture of that where the rock was. Right there.</td>
<td></td>
</tr>
<tr>
<td>05 13 45 09 CDR</td>
<td>Okay. What I recommend we do is change film packs.</td>
<td></td>
</tr>
<tr>
<td>05 13 45 13 LMP</td>
<td>All right. That's a good idea. We'll do that next.</td>
<td></td>
</tr>
</tbody>
</table>
Okay. Why don't I - Okay, I'll get this camera out -

Stay right there just a second.

Shoot a - shoot a good - shoot a PAN and get the Surveyor - use up that film.

Hey, that's good. I didn't - That ought to be good. Ah, it's a bad place to shoot, but I'll try it, though.

Al, what I think we can do is walk down here about 300 feet and walk straight down that slope to it.

I do, too. It doesn't look so bad from here, does it, Pete?

No.

Okay. Want to change the cameras, now?

Pete, will that direction of your travel be to the northeast direction?

No, what we do is go directly east and then walk directly short of north, you know, curving right around and down to it. It doesn't look bad - it's - I'll tell you, getting - -

Roger. Copy. You're going directly east and then you'll be curving around going up north towards the Surveyor.

Yes. You get a - kind of an optical illusion, depending on where you're standing.

Trade me one. Trade me magazines.

Okay. Wait a minute.

Careful when you undo it.

I'll tell you what. You'd better put that one in.

No, we want the dark.
05 13 46 53  CDR  Okay.
05 13 46 54  LMP  I wanted to put it back on here, Pete.
05 13 46 57  CDR  All right. I'll try.
05 13 46 58  LMP  I don't think it makes any difference. We just put it in here. You're right.
05 13 47 02  CDR  All right.
05 13 47 03  LMP  Just put it right in there with the rocks.
05 13 47 05  CDR  Yes. Yes. Thank you.
05 13 47 10  LMP  Let me - let me hold the camera, see - Wait a minute. Okay. Go. Boy, these cameras got dirty, didn't they? That won't be any trouble.
05 13 47 24  CC  Pete, a reminder on that film pack, cycle one frame before you start.
05 13 47 29  LMP  Roger. We cycled one before we took it off, too. I think we're in good shape, Houston.
05 13 47 37  CDR  Good thing we've practiced this a few times. I tell you what. Why don't you let me hold it for you? Okay?
05 13 47 44  LMP  Just a second. Here, I'll show you what you need to do. Pull this out of the way. The rock is what's driving me buggy. Wait, wait. Hold the camera. Hold it there.
05 13 47 58  CDR  Okay.
05 13 47 59  LMP  That's - that's it.
05 13 48 10  LMP  Hold the camera.
05 13 48 11  CDR  Okay. Got it?
05 13 48 19  LMP  ...
05 13 48 27  CDR  That's it. You got it.
05 13 48 28  LMP  We got it.
05 13 48 29 CDR Good show. Hot dog.

05 13 48 32 LMP Wait a minute; wait a minute. Okay, keep the trigger pulled. Trigger pulled. Let her go. Now try it again. Try it again. That's it, babe. No strain. Okay, let me put it on.

05 13 48 45 CDR That lens is good and clean, too.

05 13 48 48 LMP Okay. Hope we didn't get anything on the reseau lens inside. I bet we got some dust on it. Where am I? Okay.

05 13 48 56 CDR Huh?

05 13 48 58 LMP Great. Got her on there, Pete.

05 13 48 59 CDR There you go. Okay. Let's wander over here.

05 13 49 09 LMP Yes. I think a strap on you or something like that so - each of you, so if you want to lean over and pick up a rock, the other guy just holds the strap; you lean over and pick up the rock and go. Some bigger sample bags. Hey, Pete, why don't I - I'll bring it back.

05 13 49 26 CDR What do you want?

05 13 49 28 LMP I was going to say as long as you're --

05 13 49 29 CC Good thought, Al.

05 13 49 34 CDR We're moving on, Houston.

05 13 49 46 LMP A few minutes ago, Pete wanted to pick up a rock, so I held onto a - that strap of the Surveyor bag and he leaned right over and picked it up and I helped him get back up. It's not that you're heavy or anything, it's the fact that you don't - you have such poor balance.

05 13 50 00 CDR Look at that glass - ...

05 13 50 06 CC Pete and Al, Houston. Before you go much further, could you stop and have a little break there before you proceed on down the slope.
Sure can.

Yes. We're just going to move to the area, where we could stop and case the joint. Al, grab a shot of that beaded glass there and we'll bag it.

Okay.

That's better than the Hope diamond.

Set her up.

Better take that.

There you are in here.

Okay.

Okay. I got it, Pete.

Got her?

Yes. Got a lot of those; we've - got too many of them.

Oh, you did get a lot of these?

Yes. Why don't you get that? Pick it up --

Get the rock with it. Look.

Okay. Get some rocks with it. That's a good id - Hey, here's some rocks right here. There's good rocks. You know, we keep collecting a lot of the same type of rocks, because there just doesn't seem to be any other kinds around. I haven't seen any microbreccia the whole day; I've looked around for it. All I have seen is some basalt; I've seen nothing that looked vesicular at all, except on the surface.

I haven't either.

You know, that's real strange; it's - it's not at all like Neil's rocks. Close as it comes is that gabbro --
Roger. We copy those comments. Pete and Al, we show you're 2 plus 23 into the EVA; and, based on a 4-hour EVA, you'd be leaving the Surveyor at 2 plus 50. But don't rush; we'd like to make sure you get a good rest before you go into it.

Okay.

Why don't you give me a rock or two, Pete, and I'll stick in there. Got any spares? There you go. Good rock. Good rock.

Get a load of this crazy juggling act.

Treasure. Okay. That will hit. We just made a sample of - glass bead and some local rock on the south edge of the Surveyor crater, Houston. And they're going into bag 14-D.

I'm remembering back to all of our training.

14-D.

I'm trying to remember who the guy was that kept saying, "Whatever you do, don't get dust on the gnomon."

(Laughter)

Okay. We're going to jog on here for a little bit, Houston, and get a little bit closer to the Surveyor and look her over.

Yes. Hey, that's coming in from the south; looks like a good way, Pete.

I'll tell you what I'm going to do, Al. I'm just going to lope right around here.

That's what I mean. If you stay at this level, you'll end up at Surveyor.

You're right.

Follow the contour lines.

No problem at all, Houston. ... the scoop and you couldn't see that before. It's kind of --
05 13 53 20  CC  Pete and Al, could you give us a comment on how far you're sinking in?

05 13 53 22  CDR  Not sinking in very far at all; this is fairly firm stuff. And I'm down in the crater about the same distance down that Surveyor is. I'm just going around it radially. Wouldn't you say so, Al?

05 13 53 39  LMP  Yes, I would say that - I think Houston is just concerned about us getting down in this crater. We been thinking about it, too, Houston.

05 13 53 47  CDR  Okay. Don't worry about it, Houston, because it's really, it's no strain; I'm 200 feet away from it --

05 13 54 00  LMP  That's right.

05 13 54 03  CDR  -- It isn't exactly like we thought it was going to be last night, when we were talking about it.

05 13 54 05  CC  Roger. Sounds good.

05 13 54 06  LMP  Yes, it is. I don't think there'll be any sweat about it.

05 13 54 07  CDR  Al, I'll tell you what let's do. Let's go right over here, and we'll park all our gear, take ourselves a little rest, go over your photo plan, and then we'll have at it.

05 13 54 18  LMP  Okay. Let's go right over here.

05 13 54 20  CDR  I'll tell you what, why don't you get a photograph of it right now?

05 13 54 23  LMP  That's a good place. Okay. Will do. I can do it right here.

05 13 54 27  CDR  I'm trying to see which way it landed.

05 13 54 35  CC  Okay, Pete and Al, when you are looking at it there, would you also try to determine whether there is any effect from the dust during the descent? That is, could you determine whether
there is more dust on either the west or the east side of any of the bays, and the north or the south side of the camera?

05 13 54 55 CDR
Okay. We sure will. I actually flew around it; however, I probably passed closer to it than I am parked to it right now. No, that's not really true. I'll tell you, the way that dust was going, it probably went right over top of it.

05 13 55 13 LMP
Yes. That's right. Any dust you hit on the edge would never go down in this crater.

05 13 55 17 CDR
Yes. What happened to your volume, Al?

05 13 55 20 LMP
I don't know. How does - Sounds good to me.

05 13 55 22 CDR
You're just a little bit down in the mud.

05 13 55 24 LMP
Okay. I'm not talking loud enough.

05 13 55 27 CC
We read you both loud and clear.

05 13 55 28 CDR
Okay. No problem.

05 13 55 29 LMP
I'm going to mosey up here just a little, Pete, without any tools, which makes it pretty easy.

05 13 55 33 CDR
Look, I'll tell you what. Let's leave the whole - Tell you what, let's take the tool carrier with us -

05 13 55 38 LMP
Yes.

05 13 55 39 CDR
-- I think we can go right up the other rim and around to --

05 13 55 40 LMP
Sure.

05 13 55 41 CDR
-- and --

05 13 55 42 LMP
-- Right on out --

05 13 55 43 CDR
-- that big blocky baby there and --

05 13 55 44 LMP
-- Hey, maybe we can get that bedrock --
05 13 55 45 CDR  -- ... right over there at that - that --
05 13 55 47 LMP  Huh?
05 13 55 48 CDR  -- neat crater. Where all that rock is just --
05 13 55 49 LMP  -- ... 
05 13 55 50 CDR  -- back of the LM.
05 13 55 53 LMP  ... -- 
05 13 55 54 CDR  You know, I could have landed the LM in the bottom of that crater. It would have scared me to death, but --
05 13 56 13 LMP  Okay. Okay, Pete. Why don't - Would you carry the handtool carrier down there?
05 13 56 17 CDR  Whoop.
05 13 56 18 LMP  And let me take some pictures up here around it?
05 13 56 20 CDR  Okay.
05 13 56 21 LMP  Now, look. You can see which way it came in. See the way these gearpads dug in over there --
05 13 56 25 CDR  Yes.
05 13 56 26 LMP  -- dug up dirt? They're still setting there.
05 13 56 28 CDR  Yes.
05 13 56 29 LMP  This is going to make a good shot. We're not supposed to take pictures with that MAG; we'll have to do it, though.
05 13 56 43 LMP  Beautiful. Beautiful sight. You know, this one's brown and I don't remember ours being brown there at the Cape. Kind of a light tan or maybe that - maybe that's the way it's changed color. What color was this one, Houston, white? When - when it started out?
05 13 57 02 CC  Stand by on that.
05 13 57 03 CDR  Yes. It looks a light tan now.
Hey, this crater isn't as steep as we thought, Pete.

No. I'd better be careful; I'm going to get dust on her. Yes.

I'll stop here, and this'll be my last picture.

Al, the equipment bays were white on the side, and the scoop itself was a light blue.

Well, it's kind of a - Well, we'll get down there and get closer inspection. What was the general color of all the structure? For example, all the struts and the like? Tell you what, it looks like --

That's all white. The equipment bays and the primary structure was all painted with a white paint.

Really turned tan or something; we'll have to look at it more closely.

Yes. That's what happened. It just changed color, huh?

It sure has. Something has cooked that paint brown. Can't imagine what. You know, it's funny; on the slopes here, it's just a little bit softer. But there's no tendency to slip down or anything like that.

I know.

I don't think it's any deeper. A little softer maybe, maybe a little deeper. Why don't I move this down here just a little bit closer, Pete?

Okay.

Then we'll take the rest down here where we can see it better.

Okay. Let's just make sure we don't get any dirt down there on it.

Okay. We'll walk real slow.
Hey, you can see — Look at there where it dug those scoops. You can still see the —

Boy, that's going to make some beautiful pictures on the way that's weathered since —

Doesn't look like the pictures we saw of this a long time ago.

That's going to be good.

Oh, that is interesting! What in the hell?

Look at how it's kind of made them into — Once again, it looks like something has rained on it. They've taken on a little —

Wonder if that was from us?

Oh, no. I don't think so. As you notice, there's a general trend of lines along here from the north — that would be the northeast or the southwest — See those little lines running along through the crater here?

Yes.

I'll take a picture of that. Boy, this thing is dusty. ... 8. Just do this.

Yes, this has those lineal patterns here, Houston. Right down inside the crater; and they're not — they're not laying at all in the same direction — I mean, it's not from us — not from the LM.

No.

Roger.

Hey, Al, did you get a picture right across there?

Yes, I did, Pete.

Why don't — why don't you go ahead and put this together?

Okay. — your tongs while you're there. Just a second. I'll give them back to you.
05 14 00 08 LMP  Good place to rest.
05 14 00 22 LMP  I may not --
05 14 00 23 CDR  Is that the way that thing goes?
05 14 00 25 LMP  Yes. I'll check.
05 14 00 30 CDR  Let me hold one end of it.
05 14 00 31 LMP  There you go. Push it; there you go. I think
                  that's it.
05 14 00 48 LMP  Pete, could you hold - hold that a minute?
05 14 00 50 CDR  Wait just a second.
05 14 00 51 LMP  Okay. What are you trying to get?
05 14 00 53 CDR  I dropped something down in there. Okay, there. Now, I can
                  hold it. What do you want me to hold?
05 14 01 00 LMP  Hold that camera a second. Got it?
05 14 01 04 CDR  Why don't we just throw that camera away?
05 14 01 06 LMP  Well, I was thinking of that earlier and decided
                  that, since this one broke, we might have to put
                  that one on.
05 14 01 11 CDR  --
05 14 01 12 LMP  The reliability ... not to make it.
05 14 01 42 LMP  Makes me kind of mad.
05 14 01 44 CDR  Huh?
05 14 01 45 LMP  Look down there just once more.
05 14 01 55 LMP  There you go.
05 14 02 09 CDR  Oh, boy.
05 14 02 18 LMP  ... 
05 14 02 20 CDR  Yes. I'm holding it with this post.
Okay.

Wait a minute. What's in your bag, here?

There's a film magazine.

Let me borrow your little thing, here, while we rest.

Move that handle and throw it away.

Okay. That's a good idea.

... out of there we don't need.

Turn this in.

Bad. Had it.

Huh? I'll get it.

I'll tell you what, why don't you mosey down there and start taking some photographs?

That's a good idea. Got you cuff checklist there?

There.

Okay.

The first thing is photo bay A, 11, 15 feet, one picture.

11, 15; let me get a check. 11, 15. Boy, that's turned just kind of a light tan, hasn't it, Pete?

It sure has.

And some of the things are even a dark brown.

Now, you're closer than 15; don't go any closer.

Yes. Maybe I'd better back up a little.

That a boy.

How's that?
05 14 05 17 CDR That a boy --
05 14 05 19 LMP Photo bay A -- 11, 15, one picture.
05 14 05 22 CC Hey, Pete, do you think there's a chance you're at the wrong Surveyor?
05 14 05 24 CDR No, sir.
05 14 05 26 LMP Boy, it sure dug in the ground, didn't it? Oh, look at those pad marks. They're still there. Still the waffle imprints on it. Okay. What's next?
05 14 05 34 CDR Photo TV sector, f:8, 15, three pictures.
05 14 05 39 LMP Okay. Let me move down.
05 14 05 41 CDR Hey, this cuff checklist sure helps do the job.
05 14 05 45 LMP It sure does.
05 14 05 48 CDR Cadet Gibson checklist. Okay, Al. Look at that dirt's still on the footpad. It's going to make a great --
05 14 05 54 LMP -- - - and compliments to the CAP COMM.
05 14 05 57 CDR Hey, we got a nice brown Surveyor here, Houston. Even the tanks which were --
05 14 06 03 LMP Yes. Raise the visor and it's not so brown, but it's tan.
05 14 06 07 CDR The glass is still on the top.
05 14 06 09 LMP Not a bit of it is fractured.
05 14 06 10 CDR Yes.
05 14 06 11 LMP Amazing.
05 14 06 12 CDR Okay. Shovel is gray. Take the Surveyor scene here.
05 14 06 18 LMP I don't want to kick any of this dirt up because I'd like to get a picture of the compacting of the dirt there.
05 14 06 22 CDR Yes.
05 14 06 23 LMP It's going to be a tough shot.
05 14 06 25 CDR That's photo TV sector, f:8, 15, and three. Now, I have photoscoop imprints, f:8, 5, two in stereo.
05 14 06 35 LMP Okay. Wait. I'm not, I'm not finished yet.
05 14 06 43 LMP Boy, that color chart has sure changed colors these days.
05 14 06 47 CDR Okay.
05 14 06 48 LMP Let me get a quick shot here. About 15 feet and I'll shoot.
05 14 06 53 CDR Okay. Now, I want the footpad photoscoop imprints f:8, 5 feet, two in stereo.
05 14 07 02 LMP Okay. Those scoop imprints look different than I imagined.
05 14 07 06 CDR Okay.
05 14 07 07 LMP Let me try them. And a little closer.
05 14 07 11 CDR You have to really bend over.
05 14 07 13 LMP You do.
05 14 07 14 CDR Back up. Say, where you're shooting, Al?
05 14 07 19 LMP Shooting right there where the scoops made the scoops.
05 14 07 20 CDR Oh, I'm sorry. Yes. The next one is photo the footpads: two prints, f:8, 5, two in stereo.
05 14 07 30 LMP Wait just a second; I'll get it. I'm going to - I know what I'm going to do.

05 14 07 37 CDR Okay.

05 14 07 38 LMP Okay. I'll get the footpads now. And I'll also get the dirt that's on them. That looks good. Okay. What's next, Pete?

05 14 07 51 CDR Disturbed surface by the footpad-2 area. Okay. Then take photo. FP-2 area, f:8, 5, in stereo.

05 14 08 01 LMP Okay. Will do. Did it - yes, that disturbed it all right. Well, we'll be able to get the rocks that the Surveyor's on - No strain. Get a bunch. There's one. Okay. Next one, Pete.

05 14 08 24 CDR Photo vernier engine bay A, f:11, 5 feet, one picture.

05 14 08 31 LMP Okay. A little bit to the east of - - *** pretty good. The engine is still green.

05 14 08 34 CDR Yes.

05 14 08 35 LMP In fact, that green seems to have had less change than most of the rest. Okay, Pete. That's complete.

05 14 08 47 CDR Photo large box A, f:8, 5 feet, one picture.

05 14 08 53 LMP Okay. Say that again now. I was checking something else real quick.

05 14 09 00 CDR Okay. The big box.

05 14 09 02 LMP Okay.

05 14 09 03 CDR At 5 feet.

05 19 09 04 LMP Five feet.

05 14 09 05 CDR f:8.

05 14 09 07 LMP Okay. Will do.

05 14 09 11 CDR Okay. Now be careful about the glass.
And they want you to smoke that over carefully and photo wipe and then photo the --

Now be careful. Let me look and see what it looks like. Houston, not a bit of this glass is cracked. One little piece down here looks like it no longer reflects, but other than that, it's in perfect condition. A little warped - segments warped, but other than that, it looks pretty much the same. The thing that's the most amazing to me is how it's turned so brown. I want to wipe it a little bit, Pete.

Wipe it with my --

Roger. We copy that, Al.

I'm going to wipe it, but not with my glove. I'm going to wipe it with this little cloth that protects my wrist ring. It doesn't have any structural thing - anything structurally associated with it.

It wipes off just like you'd expect us to wipe off glass.

*** wipe a couple of spots, so it might be - It's going to be tough to show this, Pete. It's in the shadow. Give it a go, though. I don't think the pictures are going to show you much, Houston. Because it's - Well, we'll give it a go, but --

They're better than no pictures at all.

That's right. That's exactly right. Okay. Got it there, Pete. Ready for the next one.

Okay. Photo small box f:8, 5, one.

Okay. Now, that's pretty much in the shadow. I'm going to open it up a little bit.
05 14 10 41 LMP  No, no, no. It's in the shadow of the landing radar or the instrument box.

05 14 10 45 CDR  I think you ought to photo that scoop there, the way it dug in.

05 14 10 48 LMP  I did.

05 14 10 50 CDR  There's no way that thing can slide down the hill on us the way it's dug in.

05 14 10 57 LMP  Okay, now let me get that footpad. That's a beautiful shot there. We're going to do footpad 3, I guess it is, or is that 1?

05 14 11 03 CDR  That's 3.

05 14 11 04 LMP  Okay. And that's going to be in f:8, probably. It's pretty low; let me try 5.6.

05 14 11 12 CDR  That aft honeycomb shock absorber struck the dirt and looks like it took some of the shock. Other than that, the front one didn't appear to do that.

05 14 11 24 LMP  Sure isn't going to slide down the hill though, that's for sure. Okay, Pete. What's next? Back up 15 feet and take it.

05 14 11 30 CDR  Photo bay B --

05 14 11 32 LMP  Okay. Let me get over here.

05 14 11 33 CDR  f:11, 15, l --

05 14 11 35 LMP  It's going to be a tough shot, because it's in the Sun, but I'll get - let it go. Get over here; that might help it.

05 14 11 51 LMP  Back up a little bit more. How's that for 15 feet, Pete?

05 14 12 02 CDR  You're more than 15.

05 14 12 03 LMP  Okay?

05 14 12 06 CDR  Now, you're good.
Okay.

*** too high.

I know it. I'm trying to shoot the top ... again. Give them a few extras. Okay. Go ahead.

Okay. Photo solar array; got photo, footpad 3. Those solar arrays are not blue anymore; they're black.

Hey, how do you do that? Let me try it from here. Oops - what's the solar array setting?

5.6, 15 feet, one photo.

Right on track. Okay, shot.

Okay, move around to the front.

Next one?

Photo, footpad 3, f:11, 5 feet, one photo.

All right, got it in sight. It dug in real well, too. It's probably - it's right, in fact, it's right - dug in right to the top of the --

And another thing we're going to photo is the scoop trenches, f:8, 5 feet, at 2.

Okay.

There's the Canopus seeker.

God! There's some - Hey, let me get the top of this little instrument box, because the glass is fractured there.

Okay.

They're interested in that, if I can get it. See up the hill here. Oh, look! There's where it hit. See?

Is that your warning tone or something else?

No. Nothing I know of.
That's that noise again that we had yesterday, remember?

Okay. Now I photograph the trenches, right?

Yes.

Okay.

Hey, this is - this is so much easier working around than in one g in our practice; it's unbelievable.

Pete, can you move? You're shadowing the situation.

Yes, sir.

Trenches at 5 feet?

Roger, Pete. Good way to have it.

Five feet or 15 feet?

What are you photoing, Al?

The trenches.

Photo the scoop trenches at 5 feet, f:8, in stereo. Watch it - watch it now; you're going to get dust on us.

I'm watching real close.

Now, you're farther than 5 feet.

... You're right.

That a boy. That's it.

Camera's moving all the time, so I guess we're getting it.

Okay. Photo the TV mirror.
05 14 14 53 LMP  f:8, 5 ...
05 14 14 57 CDR  The TV mirror is brown.
05 14 14 59 LMP  Yes.
05 14 15 01 CDR  It's no longer a mirror.
05 14 15 03 LMP  No, it's brown because it's looking at brown, isn't it?
05 14 15 05 CDR  No, it looks like --
05 14 15 06 LMP  Maybe it's got some coating on it. Yes. It does.
05 14 15 09 CDR  Why don't you stay right there, and I'll come in and wipe it?
05 14 15 13 LMP  Okay. Come on in and wipe it. Look it over close.
05 14 15 16 CDR  See the mechanical components down inside it.
05 14 15 19 LMP  Okay.
05 14 15 27 CDR  It's just got a fine dust on it.
05 14 15 28 LMP  Fine dust on it. I'll be darned! Yes. Get a shot of that; that will be a good - Let me see if I'm set right. No, I'm not set right! Did you tell me 5.6?
05 14 15 40 CDR  No. Photo TV mirror: f:8, 5 feet --
05 14 15 47 LMP  Oh, no! Okay, I goofed it. I'll take it again. Hey, get over here, Pete. Get one more shot.
05 14 15 54 CDR  Okay.
05 14 15 57 LMP  You don't get a chance like this every day, now. Shoot up the extras; we've got lots of film.
05 14 16 03 CDR  There you go. Okay? Why didn't you get yourself in the photo, too?
05 14 16 12 LMP  Okay. Just a second. Back up just a little, Pete. Try for 15 feet. Okay. That ought to be good. How's that look to you?
05 14 16 37  CDR  Good. Come in just a foot.
05 14 16 41  LMP  You got a calibrated eye? Oh, that camera is not right on the money; it's out of focus.
05 14 16 52  CDR  Okay. Okay, Houston. I - I'm jiggling it. The Surveyor is firmly planted here. That's no problem. Okay, Al. We're ready to start getting the TV camera.
05 14 17 01  LMP  Okay.
05 14 17 07  CDR  Now, do you want to do something for me first?
05 14 17 09  LMP  Yes, sir. Okay. I sure will.
05 14 17 28  CDR  I'll be darned. All soft dirt.
05 14 17 39  LMP  Give me a big smile.
05 14 17 40  CDR  Okay.
05 14 17 41  LMP  Okay.
05 14 17 43  CDR  Okay. Get him back on the front. I'll tell you what I'm going to do. Okay. Let's go - Wait a minute. ... can you get the tool off my back?
05 14 18 07  LMP  Yes, just a second.
05 14 18 13  CDR  All right, we're going to have to start moving out.
05 14 18 16  LMP  I know it. Okay. Retrieve cutter and can. Okay. Here we go. There's the cutter. Hey, this is easier in one-sixth g. Here comes your cutter, babes. Okay. You still don't have a cutter. Now, let me get the can.
05 14 18 43  LMP  Okay. One cutter. Okay. Looking good. Houston, can you hear us okay?
05 14 18 58  LMP  Suppose they can't hear us anymore?
05 14 18 59  CC  Al, say again.
05 14 19 01  LMP  Okay. ... under a white. We just wondered --
Negative, Al. We read you loud and clear.

Okay. I thought so, but that cable's arranged a little bit differently from the one we trained on.

Yes. It looks it.

... ready to capture that cable.

Yes, ready.

Okay. Now, this cable here - It's not a Y-cable at all, is it?

No. Well, it is a Y-cable but it's of a different manner. Hey, here's something else they didn't tell us either. Look at that.

A few extra ones.

I'll tell you what. You're just going to have to get that - reach in under enough to cut it on the other side.

Just wait a second. Let me get in there.

Okay.

Drop that in the can. That's the only piece they're going to get that way. Okay. ... Watch it.

Yes. I've got to cut the cable back here, though. Okay.

Why don't you - Why don't you give that a cut right there, Pete? Give them a couple of pieces. There you go.

All right, back off.

Okay, you've got to - Hey, you've got to cut this cable, too, Pete.
No, it goes around the camera.

All right. Oh, no, it doesn't either. Under those tubes, isn't it?

Yes.

And here's a few extras. And it's wired entirely different --

Wait a minute. You've got to cut the other side of that little hole.

Yes, I know.

There you go.

Now, you've got it.

Gosh, did you see that material disintegrate? Hey, that cuts easy. Now, which tube did you want to give me, Pete? Do you want me to hold one of those tubes?

Yes.

Let me get in there close.

I got it.

Yes. Okay. Go. Got to be careful.

Got it?

No, it's too big.

Too big? Wait, wait, wait, wait, wait!

Okay.

Okay. Let me put the top on.

It has sort of weathered a little bit in 3-1/2 - 31 months, hasn't it? ... here, though.

Hey, what?
05 14 22 06  CDR  That antenna is still pointed right to Earth.  
... normal, though. It never had to move.

05 14 22 16  CDR  Okay, that's done. Captured that.

05 14 22 21  LMP  Okay, we've got the - got the sample, Houston.  
The sterile sample, the cable, and tube. Okay, 
that's in there good; let me make sure that's in 
there tight, Pete.

05 14 22 38  CDR  Okay, one shiny tube coming up. Okay, wait a 
minute. Be around there in a minute. Look at how 
all that stuff fractured and fell on the ground.

05 14 22 49  LMP  Yes.

05 14 22 50  CDR  The paint's flaked off.

05 14 22 51  LMP  Yes. That looks like a shiny mirror, some kind of 
thermal coating.

05 14 22 57  CDR  I hate to tell you this, but the Surveyor tool is 
giving me --

05 14 23 02  LMP  Hey, that's a tougher tube than we're supposed to 
have, gang. I'd say forget that tube and find 
another one.

05 14 23 07  CDR  Yes, or I'm going to break the tool.

05 14 23 09  LMP  I know it. That's --

05 14 23 10  CDR  That tube on the back we are supposed to collect, 
Houston, is just a little bit stronger than it's 
supposed to be, for a glass mirror.

05 14 23 19  LMP  Okay. We're going to have to pick another tube. 
How about right here, Pete?

05 14 23 20  CDR  Wait a minute.

05 14 23 22  CC  Roger. We copy.

05 14 23 23  LMP  That's a shiny tube; that would be a good one if 
we could cut it.

05 14 23 27  CDR  Where?
05 14 23 28 LMP Right there.
05 14 23 29 CDR Oh, that's even thicker.
05 14 23 30 LMP Yes, I guess it looks it, doesn't it?
05 14 23 31 CDR Get the camera. Forget the tube.
05 14 23 34 LMP Why don't you bang your way out of that glass?
05 14 23 36 CDR ... or break the tool, no kidding.
05 14 23 41 LMP Hey, Pete.
05 14 23 42 CDR Huh?
05 14 23 43 LMP Why don't you bang that glass one?
05 14 23 46 CDR Won't even break (laughter). That's pretty good
glass, Houston. Can't even break it with our --
05 14 23 53 LMP There you go. Take a piece off, and I'll collect it and put it in.
05 14 23 58 CDR Kind of crunches, doesn't it? Man, that's not
glass. Terrible! Man, forget it.
05 14 24 04 LMP I don't know what it is.
05 14 24 06 CDR That's sure not what we tried out in Houston --
I mean at the Cape. That's metal with glass on top of it.
05 14 24 13 LMP You'd better take a picture of it.
05 14 24 21 LMP Amazing. That's a tough shot, too. Let's get over on this side of it.
05 14 24 26 CDR Okay.
05 14 24 27 LMP Okay, that'll be a good shot, I think. Just a minute. Okay, Pete.
05 14 24 41 CDR Come on, boy; we got to move.
05 14 24 43 LMP Wait a second.
Got it? Okay, whip around the other side of that scoop and let's get that camera.

All right. All right. Wait, I got to open your bag.

I'm not going anywhere.

Okay. I just got to open your bag.

That one's good. All the parts are working.

Okay. Thanks to Joe Roberts, this bag's going to do the job, I think. There. He worked hard on this thing. Let me reach down in there and open it up now.

Okay?

Yes, it works great. Thing popped out wide open.

That's ...

Uh-oh.

What's the matter?

Well, it's not - Get a little open here. Every second I spend opening it up is worth about 2 minutes when you try to put it in the bag. Okay. I think it's open now.

Hey, I got a shiny tube for you.

Okay. Let me get it. Let me get it. You sure do. That's a good one, too. Here. Wait a minute. Watch your hand.

Okay.


Little more, Pete.

Okay, two more tubes on that TV camera and that baby's ours.

Okay.
05 14 26 38  CDR  Good.
05 14 26 40  LMP  All right. Let's get them.
05 14 26 45  CDR  There's one.
05 14 26 49  LMP  Let me get a grip on him now.
05 14 26 50  CDR  Okay. It's ours!
05 14 26 58  LMP  (Laughter) ... we got her.
05 14 27 02  CDR  Beautiful.
05 14 27 03  LMP  Turn around.
05 14 27 04  CDR  Let me lay it on you, man (laughter). It'll fit
                   right in that sack. Hey, is this ever lighter
                   than that one in Houston?
05 14 27 14  CDR  Let's get the scoop while we're at it.
05 14 27 16  LMP  Okay. I think I can hold that thing with one
                   hand and open the bag. Get in there. Get in that
                   bag.
05 14 27 22  CDR  There you go.
05 14 27 24  LMP  In the bag. In the bag.
05 14 27 25  CDR  In the bag?
05 14 27 27  LMP  Here, wait a second. Now, I've got to zip it up.
05 14 27 29  CDR  Good show.
05 14 27 33  CC   Copy. It's in the bag.
05 14 27 34  LMP  It's in the bag.
05 14 27 48  LMP  Okay, let me get around to the other side of you.
                   It's a little hard to zip. This is one of the
                   hard parts.
05 14 27 53  CDR  Okay. Want me to bend over a little bit?
Yes. I sure would. Okay. And lean back. That'll do it. Just like that.

Don't turn it over.

I won't. I won't. That'll do right there. One more pull and I've got it.

Okay.

I've got lots of oxygen.

Yes, same here. Okay. Now, let me put the covers down on it.

Before you get that thing buried too deep, how about letting me cut this scoop off?

Well, okay, scoop goes right in here.

Oh, you've got a place for it.

Well, sure. You didn't think you were going to leave without a scoop, did you?

No.

Okay, grab the scoop.

Man, there - that's the problem.

That's what they said, but - Let me hold it. Maybe --

Wait a minute. Wait a minute. Let me - let me help.

You got it.

Broke.

That's good.

Oh, smooth as silk.
Cut it apart right here. Now, that's right. They wanted it - No, they wanted it just after that joint. So cut it right there.

Okay. Good cut, but they wanted that joint if they could get it. Are you at the root? No, you're okay.

That's it. That's it.

One scoop.

That's dandy! It's even got dirt in it. Bring back some of the original dirt. Okay. Got an extra sample for you, Houston. The scoop's got dirt in it. Okay.

Well done, troops. Say, when you move out from here, right? - Well, first of all, we show you're 3 hours into the EVA; and you're about 10 minutes behind nominal traverse we had figured out for a 4-hour EVA. However, your PLSS consumables are holding out real well, so we suggest you go on with the nominal traverse. We may want you to cut down to perhaps just one sample at blocky crater.

Okay, that's what I wanted to do is go to blocky crater if you agree - -

Hey! Hey, look - look at this, Pete.

What?
We thought this thing had changed color, but I think it's just dust. Look, we rubbed into that battery, and it's getting shiny again. Let me get a shot on it.

Okay, go ahead.

I think that's what — maybe this thing's just collecting all this red dust.

Well, they'll know when they get that TV camera back ...

Okay, Pete and Al, before you leave there, also, would you get some of those geosamples which we've discussed, as well as some of the loose soil from that area?

Will do. We'll do it right now.

Okay.

Let's do it.

Here's this rock right here. Let me give the Surveyor tool a heave.

Okay.

We don't need it for anything, do we?

Houston, we don't need this Surveyor tool anymore, do we?

If you've got the TV back at the LM already cut off, then there is no more need for it.

Okay.

That TV's ... Okay. Al, have I got my scoop on?

Do you?

You've got your full measure of rock right here. Okay. Let me go get the sample bags.

Hey, that's a good one.
I don't think the TV could see that one, though, I figure it was too close. How about this one?

... down with you.

Okay. All right, now. Trying to remember where that - they got a ... one.

Here's a square one. I see one up there, right now.

Where's the one that had the lines in it?

I think it's right over - right up here on the - There's a crater, right up - I'll show you. Looks like a brick over there.

Come on, I've got these two rocks over here. Let me dump them --

Pete and Al, Houston. Before you leave the area of the Surveyor, would you take a look back at the Surveyor and see whether the direction of the sunlight has any effect on the colors which you see?

Direction of the --

Wait, wait! Let me get this in the bag, too.

Sorry. Didn't know you had it, Pete.

Okay. No, it's light brown wherever you look at it, up-Sun, down-Sun, or cross-Sun.

But, strangely enough, that light brown rubs off. That's the funny part.

Yes.

That's funny, because the dirt here is not brown.

Look, is that the rock right there? You know, these rocks, as they showed in the Surveyor pictures, all have this soil buildup around them.

Yes, they're still there - all the fillets around them.
05 14 32 26  CC   Roger, Pete.
05 14 32 28  CDR   I'm trying to remember where - I can't orient myself to the pictures, can you?
05 14 32 33  LMP   No, there's - I think it's about --
05 14 32 35  CDR   Should we grab this one right here?
05 14 32 37  LMP   That's a good rock right there.
05 14 32 39  CDR   I don't know whether I can get that or not. Let me see.
05 14 32 49  LMP   We'll get it. That a boy. There you go.
05 14 33 00  CDR   Okay, let's head for blocky crater; pick up a couple of more of these enroute.
05 14 33 09  LMP   Sounds good to me.
05 14 33 10  CDR   Let's get that brick-looking one over there. I think that's one of them they saw there. Up the hill a little bit - ways. That was one they saw.
05 14 33 20  CC   Pete and Al, we have comment on what you just said about brushing up against the battery case.
05 14 33 24  CDR   Yes.
05 14 33 25  CC   Would you make sure that anything which you picked up against that battery case you clean off your EMU?
05 14 33 30  LMP   Yes. We're thinking about that --
05 14 33 32  CDR   There wasn't any signs of KOH anywhere. --
05 14 33 34  LMP   Yes. We've looked, and --
05 14 33 35  CDR   The battery case was tight. Nice and tight and brown.
05 14 33 39  LMP   Right here's the one, the square one, Pete.
05 14 33 43  CDR   Where?
05 14 33 44  LMP   There.
Roger.

Okay. That's about enough rocks, pal.

I think it is, that is, for here. Let me get it. Okay, you got it. Good show.

Okay, let's head for blocky crater.

Okay. And go to the - -

Al, do you have a sample bag number on that last one?

... All those rocks are too big for sample bags - -

They are big rocks, Houston. They're all at least 6 inches in diameter, and I think these are some of the ones you wanted. It's kind of hard to tell without having a photograph on hand or something that's standing there and studying it for a lot longer than I think we care to do it, just which rocks are which.

Roger.

It's pretty easy to move along on this slope. It's just a little bit deeper and it a little bit softer.

I'm going to take a break here, Pete, for just a few seconds.

All right. I'm right with you. Can't get up your pace when you're running on the side of a slope.

No.

You don't have a chance to go from side to side, like on level ground. Look at that huge boulder out there at - boy, I wish we could go over there.

Where?

Look at that boulder.
05 14 35 11 LMP Where?
05 14 35 13 CDR Straight ahead. See it there? Alan?
05 14 35 18 LMP No, where?
05 14 35 20 CDR Over the top of the hill.
05 14 35 23 LMP Don't see where you are looking.
05 14 35 25 CDR Right on the other side of the - about 200 yards that way. See that big boulder sitting up there; the biggest one we've seen since we've been here.
05 14 35 35 LMP I don't see which one you're referring to - that one right there?
05 14 35 38 CDR Yes.
05 14 35 41 LMP Yes. Oh, these down in here are bigger than that. Look at that right here. Look at that right there on your left. Look.
05 14 35 48 CDR Let me turn around and look.
05 14 35 50 LMP Gigantic right there. There's a big one.
05 14 35 52 CDR What?
05 14 35 53 LMP Come further left. That's a pretty good sized one.
05 14 35 58 CDR I've got it. Let's get up out of the crater where we can get up on the level ground. Okay.
05 14 36 08 LMP Hey, Pete.
05 14 36 09 CDR Huh?
05 14 36 11 LMP This - There it was kind of hung up on the gnomon. Let me get the gnomon and pick it up. It's not usually on there - no gnomon.
05 14 36 32 CDR There you go. Okay, let's document up a sample here, and I think you ought to photo that whole blocky crater right there. That thing's spectacular.
It is. What is it?

CDR: That's got to be bedrock there, babe. Yes. Let's get some samples of that.

LMP: Got to be.

CDR: Hey, Houston - is the dimple crater right behind the LM? Is that - it's a big blocky impact crater.

LMP: That may be cool enough back in MIN cooling.

CDR: It's funny. I don't have any - I kind of thought it would be tough down in the crater, losing your balance, but it doesn't seem to be; it's just harder walking, that's all.

CC: Pete and Al, could we have EMU check?

CDR: Sure could. We're right at the top of the rim, we can get a good place to rest. I am reading 36 percent oxygen.

LMP: We're okay.

CDR: We're going to sample - I'll tell you what we're going to do, Houston. We're going to get an EMU check here; we're going to pick up one sample out of this blocky crater; give you a partial PAN of it because it's a pretty fantastically interesting crater with a lot of bedrock. Big chunky rocks blown up out of it -

LMP: Very angular. Very sharp.

CDR: -- and get a sample of the double craters on the side of the Surveyor crater, and then my recommendation is, we've got so much gear and so many rocks, that we head for the LM and start packing it all up.

CC: Roger. We concur; that's a good idea. Al, could you give us your percent?

LMP: I sure could. Looks like about 36 percent.

CC: Copy. 36 on both, and how are you doing on that film?
05 14 38 40 LMP  My camera is completely dust-covered, Houston. I just hope that the lens is open — ... 121. How's the lens? — —

05 14 38 50 CDR  Your lens is in good shape. Now, why don't you stand right here and get a partial PAN while you're resting on this crater? Either side.

05 14 38 56 LMP  Hey, wait a minute. Look at this.

05 14 38 57 CDR  What?

05 14 38 59 LMP  I can't — Forget it. I thought I saw something.

05 14 39 08 CDR  I'm beginning to think that these rocks that look red to us, if we'd just crack them open, we'd find they're plain old basalt rock on the inside. We just don't ever have any cracked. We ought to pound one of those things with a hammer in a minute.

05 14 39 20 LMP  Okay, you want me to do a PAN of this little part or the whole crater, Pete?

05 14 39 23 CDR  No, get the whole crater. Get about four shots across it and then move over and get another four.

05 14 39 28 LMP  Okey-doke. 74.

05 14 39 35 CDR  Funny, I can notice that TV camera on my back. It moves my c.g. further in.

05 14 39 41 LMP  Does it feel okay back there?

05 14 39 43 CDR  Oh, it feels okay; sure the way to carry gear; it sure beats that thing. That's a pain. Now, wait a minute; where are you shooting, Al? I want you to shoot down in that crater right there.

05 14 39 53 LMP  Sorry, that's what I — Okay, read you.

05 14 39 57 CDR  Shoot way down into it; get a stereo of that thing with those big blocks down there.

05 14 40 01 LMP  Okey-doke. It's kind of dark, but I think we can get something good. Okay, move over here. This is probably the most spectacular crater we've
come to, I think. It must have just - The original
craters took it down to bedrock and then, I guess,
more recently then, this one came in here and really
banged it out. These blocks are a lot more sharp
cornered than any we've seen anywhere else. I
guess this must be the most recent one we've been
around.

No. I got the idea that the bedrock's not too
deep, and that this was a big crater, but it's
very, very, very, very old. And then this thing
came along and hit it --

That's right.

-- and broke into the side of the bedrock that's
been sticking out into this ... --

Yes, and then threw it all out again.

I think - Let's get a sample of that rock.

Yes. Let's do. I think it's going to be the
same --

And then let's get out of here.

Okay. Want to get a docu - We document and a
couple of the big pieces. How's that?

Yes. That's a good idea. Let's see. What looks
like all the same. Right here?

Yes. Let me get a shot at it, Pete, cross-Sun.

Okay. Get a stereopair right here. We don't
need the gnomon; I'll put the --

By the way, when I shot that crater down there,
I had my distance set on 30 feet. I thought that
would be right, but that's the only one we haven't
shot on the numbers.

Get further back, Bean.

Okay. Let me get some rocks. Okay. This is
going to be sample bag number - number 15-D,
Houston.
Okay. Pete, you ought to put two or three rocks in here, just generally; and I'll photograph them, and we can see what you took. Couple of more. Those are good. Okay. You know, most of the rocks we've seen today is exactly like this. Going to pound one of these with a hammer in a minute.

Hey, there's some of that light-colored undersoil.

You're right. Okay. You want me to get another sample bag?

No. I want to start moving out.

Okay. Go.

All right.

I'll just pick up this one big rock here, Pete, and stick it in the bag.

Okay.

Good. That's a good rock.

Okay, Houston. Now, I'm going to go pack up the doc'ed samples box, and I'll understand you're going to allow me 20 pounds of other rocks. Is that right?

Pete, I've got a pretty good load here, so I'm just going to trail along behind --

Pete, what we'd like to do is to get an estimate from you of how much you think you've got in the first SRC in terms of volume or weight.

Well, in comparison to the zero-g airplane, let's see, the maximum load is 80 total pounds, right? I'm going to guess that the mass that I sent up was about a 60-pounder. Just the box.

Roger, Pete. From what you said in the first EVA and basic calculations on Apollo 11 data, we come up with about 5½ pounds.
05 14 43 46  CDR  Very good. I think that we're fairly close.
05 14 43 55  LMP  I just bet you everything we got here is really black basalt. All been colored just like that Surveyor. Hey, that bag is bouncing a little bit too much back there, Pete.
05 14 44 02  CDR  Huh?
05 14 44 06  LMP  Surveyor bag is bouncing.
05 14 44 07  CDR  Well, that's okay. It's not hurting anything.
05 14 44 34  CDR  Al, you've got to get that closeup stereocamera going.
05 14 44 37  LMP  Okay.
05 14 45 00  CDR  Okay, Houston. ... is back in the LM.
05 14 45 15  CC  Roger, Pete. You're 3 plus 16 into the EVA, and for a 4-hour EVA, you're right on.
05 14 45 19  CDR  Okay. Very good.
05 14 45 38  LMP  Hey, did you know that our EVA antenna didn't go straight up? It's on a--
05 14 45 43  CDR  I noticed that when I was running back. I'll tell you.--
05 14 45 58  CC  Roger, Al. Copy. How far off the nominal position was it?
05 14 46 00  CDR  Looks like--
05 14 46 01  LMP  It's sticking up about 65 degrees.
05 14 46 03  CDR  This thing is driving me buggy.
05 14 46 10  CC  Roger, Al.
05 14 46 39  LMP  Hey, I think all this stuff is just fine-grain basalt, Pete. We haven't seen anything else but that. We haven't seen anything at any of the places that we've gone except the same type of fine-grained basalt. It's been different colors
because of how long it's been out on the surface or where it's been. It'll be interesting when we get them to Houston and they crack them open.

05 14 47 05 CDR Hopefully.

05 14 47 10 LMP Take a rest here a moment. I used to have to push the legs down in that lunar handtool carrier, but I don't have to anymore. He just pushes his own legs; got enough rocks in there.

05 14 47 32 LMP Hey, Houston. Here's where that engine moved some dirt. You can see it here.

05 14 47 46 CC Where are you on that, Al?

05 14 47 47 LMP I'm right to the left rear of the - It looks like I'm between the plus Y and minus Z strut, and it looks like it really washed a lot of dirt off in this direction. If I look back behind me, --

05 14 48 01 CDR Hey, Al? Al? Let's get the --

05 14 48 06 LMP Need some rocks?

05 14 48 07 CDR Get the rocks over here. Come on. We can't baloney all day. We've got to get out of here. Okay. I want you to put the - put the tool carrier right here.

05 14 48 19 LMP There it is.

05 14 48 20 CDR Stick your camera in the ETB and get the film can out of there, and I'm going to start packing up the gear.

05 14 48 36 LMP Okay, here is the camera.

05 14 48 39 CDR I'm not sure - I wonder - Yes, I guess all this will fit in here; our cameras and everything, complete with this TV camera.

05 14 48 46 LMP Okay.

05 14 48 50 CDR Don't lift it up, Al, or my rock box to go.

05 14 48 51 LMP Okay.
That a boy. Okay. Do you want to take my saddle-bag off?

Okay. Here.

No, hammer.

Okay.

Got it?

No. Okay. Now I'll go do stereo closeup photos.

I'll tell you what, you go get me the solar wind, first.

Solar wind first? I'll go get it for you.

That a boy.

You want me - Let me take that little bag out there with me.

There it is, right there. Wait. Al, wait a minute - wait, wait, wait! You're all tangled up in the TV cable. I'll tell you, that TV cable is going to be - is really making me mad. There you go. That - wait, wait, wait. Wait, wait. Let's take the Surveyor - TV camera.

Huh?

Put it at the footpad.

Is that what you want to do with it?

I want you to put it at the footpad.

Oh, okay.

All right.

Let me set this down, then I'll go get it. Just a second.

Thank you. You're all tangled up again. I'll tell you, that's a trap. Okay.
Put this on the bottom one, Pete. It fits better.

Go ahead and turn this way, would you? Okay. We're much lighter. We're not going to have any trouble running this one up the LEC.

Okay. That's off there.

Where'd you put it?

Got it right here. Where would you like it?

Don't - don't drop this LEC. Oh boy, I made a mistake. I should have brought the - -

Want me to take it and move it out of the area?

I just tried to throw it under the LM now -

I can grab one end and just pull it out if you want. Why don't I do that?

It's all tangled up in the LEC, now. This happens every damn time.

Okay, I'll put this - Where do you want me to put this? Right here - right in the footpad.

I'm going to straighten this LEC out right now.

There you go.

Now, look, when I disappear with the LEC, you get that TV cable and get it out of here.

Okay.

There you go. Now, just throw the TV cable under the spacecraft.

Okay. Just a second.

There we go. That's better. Thing cost me 10 minutes!

Okay, I want you to get the solar wind.
Okay. Let me get this TV cable out of the way.

I could be packing some rocks.

Pete, would you hold this just one second, and then we'll get rid of this cable forever? Pull that.

Where do you want me to go with it?

Just stand right there. Then I can get this out over here, see. Before that, I couldn't.

There, now you've only got one place --

That's right.

Is that right? ...

Okay.

Leave the door ...

Okay.

Tell me when. This bag - This the bag you want me to use, Pete?

Yes.

Okay.

Solar wind doesn't like to roll up much. Little rascal - doesn't want to roll up. Just wrap it around here best I can without getting any dirt on it.

This is really ridiculous. I got dust all over the rock box, and I'm trying to blow it off. You going to manage that.

Okay. We got that solar wind.

Good boy!

Houston, we got that solar wind, but it didn't roll up in a very neat package.
Roger, Al. We copy. That's all right.

Hey, it sure didn't, did it?

No. It just didn't. It split right near the top.

Can I help you?

Yes. You can hold that, and I'll just try to roll it up as best I can without getting any — I already got a little dirt on it ... You know what I mean?

Yes.

Not a lot I can do about it. I'm sure it's a good experiment. That thing is fragile.

Here, let me hold this end, and you just wrap it tight. That's what I'm afraid of right there in the top of it. We squashed it in so it's right — Let me get this right now, babe. There you go.

Okay. It just doesn't look so good, Houston.

Give me a hand getting this rock box closed.

Okay. Will do. Hey, that's a nice full box.

That's what I'm afraid of right there in the top of it.

Now, just what we need. Wait.

Now, I've got to get this dirt off it somehow. Hey, I know. Reach right in there. There's a brush and a scribe.
Wait a minute.

Oh, why didn't I think of that earlier.

Got it? Then you can just take out the seal - There you go. Good show, Pete.

Pete, that glass brush should be over there on the handtool carrier if that will be of use to you.

We're using it right now. Works good, too. That's it. Okay, Al. Put that back in.

Back in.

Now.


Looks like you did it.

Yes. I hope so.

Okay. Got it, Pete. It looks good. Rock box 2 is closed, Houston.

Al, I want all the big ones. That looks like about 1 inch to me.

Yes.

That's it. The extra bag.

Okay, you got some of those bedrock ones in there, didn't you?
05 14 59 26 CDR Yes.
05 14 59 27 LMP Good show.
05 14 59 29 LMP Okay. What do you want me to do with that?
05 14 59 31 CC Pete, Houston.
05 14 59 32 CDR Yes. Put that up in the --
05 14 59 37 CC Okay. We'd like to give you a little weight summary for the rock boxes. If - We estimate you probably got about the same in rock box 2 as you did in rock box 1. No problem there. The Surveyor parts and TV camera will show a nominal 25 pounds in 15. What you could put in your bag that goes on the floor is about 15 pounds worth of rocks.
05 14 59 56 CDR That's it, Houston.
05 14 59 57 CC And in the left-hand side stowage bag, you can put about 25 pounds of rock. So I guess those are the two you are working for now. Fifteen pounds' worth of rocks in the bag on the floor, and 25 pounds on the left-hand side stowage bag.
05 15 00 12 CDR We - we don't have that many rocks, Houston. I'll tell you what we've got. We've got - SRC 2 is full and closed. It's - gosh, I hope I got it all in there, let me see: Solar wind, core tubes, environmental gas sample, documented samples all made it in. And the box is full, and I closed it, and I've got about - What's 1 inch on my scale? - I've got about 1 inch worth of rocks in another bag. And that's it; that's all the rocks we've got. A bunch.
05 15 00 44 CC Roger, stand by for that number, Pete. Pete, that 1-inch displacement is about 10 to 15 pounds. No problem, pack it up.
05 15 00 59 CDR Okay. That's good. Okay, now, let me ask you another question. I can get some more rocks. Why don't I do that? While Al is taking stereophotos. We'll see if I can get myself --
05 15 01 19 LMP Okay, I'm going to - I don't have a camera to go along with this, so I'll just tell Houston when I'm taking a picture and then they'll know. So
they can keep up with it. Okay, Houston. On this stereocamera, I'm taking a picture now, about 10 feet from the LM between the plus Y and minus Z strut, and I am hoping to show the effects of the engine exhaust on the lunar surface. I'm going to - That was number 800. There's one at 801. It's moving around here ... I'm going to take another one. The little counter doesn't seem to be working. Everything is working okay but the little counter. And I am taking the fourth picture right up next to the engine, here. Okay, another one close to the engine. About 2 feet from the engine. Okay, Houston. The little counter on top of the experiment's not working, so I'll just tell you what I take next. And the light and everything seems to be working so I assume it's probably taking pictures. I'm going to go look for a crater that is undisturbed and take a picture down inside it. Here's one of the --

05 15 02 57 CC Roger, Al.

05 15 02 68 LMP Okay. Here's one of a rock. Take two of the rocks. Now, I am taking a picture of Pete's footprint in the soil. You can take a look at the interaction of that. Take another one.

05 15 03 52 LMP I'm in an area now, Houston. It looks like -

05 15 03 55 CC Pete, Houston.

05 15 03 56 CDR Yes, go ahead.

05 15 04 01 CC Okay, we recommend that you pack up where you are and start trying to pack up the excess rocks you just got and think about ingress.

05 15 04 09 CDR Okay, very good. Houston, I'd like to comment to all the people who are involved in this EVA, my congratulations.

05 15 04 32 CC Well, I think you two folks did an excellent job.

05 15 04 42 LMP I'll take some of these pictures until you give me a call, Pete.

05 15 04 46 CDR Why don't you just start working your way over here, Al? And we've got an awful lot of gear, and we will start getting her up.
05 15 04 53 LMP All right. Will do.
05 15 04 55 CDR We've got about 22 minutes by my clock - 23 minutes.
05 15 05 01 LMP All right.
05 15 05 03 CDR And we got a long day in front of us. --
05 15 05 05 LMP Okay. Okay. Oh, this is so much fun. I can jump up about 3 feet and do a - 180. You might do a - 360!
05 15 05 24 CDR You got to watch it though. You get all that mass going around and you get in trouble.
05 15 05 28 LMP Okay.
05 15 06 09 CDR What's up with Yankee Clipper this morning, Houston?
05 15 06 20 CC Pete, Yankee Clipper looks real good. He's been doing P22's and rolling right off.
05 15 06 24 CDR Good.
05 15 06 25 LMP Okay, Pete, I'll take this as my last one.
05 15 06 27 CDR Okay. If he can see the Surveyor, has he been able to see us out there?
05 15 06 33 LMP Okay, that did it, Pete.
05 15 06 35 CDR All right. I don't know how many we've got there, and --
05 15 06 40 CC No report on that, Pete.
05 15 06 44 CDR All right.
05 15 06 46 LMP Here's a red one.
05 15 06 51 CDR Got it.
05 15 06 53 LMP Okay.
05 15 06 56 CDR Okay, lift her up. Now we - I'm going to put it in the ETB.
05 15 07 01 LMP Okay. There goes.
Hey, wait. I want to watch.

Ready?

Yes.

Okay.

Okay.

Okay. I think we got all the film in, didn't we, Pete?

Yes.

I tell you what. Let's send the ... and, okay, clean me, and I'll get in there, and we'll start pulling this thing because we've got quite a load.

Yes. Now, one thing I need to do is - hand me the Surveyor - Surveyor bag. Surveyor bag coming up.

... out of the way, babe. Here you are right here. Here's the two hooks.

That solves that one. All right. That's one.

Yes, it is.

Don't lock them. They never need locking anyway. I don't think we need to lock anyway. Just leave well enough alone.

That's right. Damn things are getting jammed. Okay? Is that it?

Yes.

Let's see, put it back on the footpad. Okay? Not supposed to get too dirty.

Okay. Now, let's brush you off.

Okay.

Why don't you hop up on the ladder, and let me brush you off from the ladder?
Okay, why don't you brush me off up high here and then I'll hop up and you can get me.

Okay. I'm not getting much off.

Okay.

It's a start.

Let me try you, babe.

Okay.

Oh, that isn't as hard to get off. Let me get up here. Now, I'm going to kick my feet, so it's going to get this Surveyor bag dirty.

Owl! They shock.

Okay. Let me hit you.

All right. Okay. Let me kick my shoes.

Climbing up ... I think I'm making myself dirtier. Boy, I tell you something. These lanyards get grimy black.

Is that it?

Yes.

Okay, I'll go in.

Man the camera.

Okay.

Okay, I'll watch you in the hatch.

Okay. Okay, just a second. Just let me get the door open. There's door wide open. You want my golden buzzer?

Get in.

Am I lined up okay?
You might want to turn off your PLSS feedwater when you get all the way in.

Pretty good thinking. Okay.

That a boy.

... does it.

Roll a little left. Yes, that's it. That's it. Okay, just a second. No rush. Take your time.

I've got to get this sequence camera out of the way; I don't want to leave it in here when I'm in here.

Did you ever get the picture of the LM and Earth?

No.

Oh, that's a shame.

I know it.

Hi, Earth; I can see us. It's up over the LM now. It's the first time I've had a chance to look. You're about a quarter Earth.

Let me mount the bag. Hey, you got to give me a little slack, Pete.

Oh, okay. More?

Just a second; I'll be okay. Don't put any weight on it yet. Can you hold the weight --

Wait, wait, wait - Just a second. There you go.

Now hold on. Wait, wait, wait, wait.

There you go.

Now, heave away.

Okey-doke.

It's all yours.
05 15 11 54 LMP Okay, babe, you just pull in like this. All right. Got it.

05 15 12 13 CDR Hey, Houston, the Surveyor gear is up, coming back for SRC 2.

05 15 12 23 CC Roger, Pete. Copy Surveyor parts bag in.


05 15 12 56 CDR Huh?

05 15 12 57 LMP Take it away.

05 15 12 58 CDR Okay. And the game is don't rush and do it right.

05 15 13 02 LMP Okay.

05 15 13 05 CDR Here I go get you the rock box. Okay. Like a rock box?

05 15 13 18 CDR I need some more line, Al.

05 15 13 23 LMP Okay. I've got that much more. That's the end. You may have it tangled on something, Pete.

05 15 13 32 CDR I see what the problem is.

05 15 13 35 LMP There, it's on the hatch; there you go.

05 15 13 53 CDR Okay. Lift away, you've got a rock box.

05 15 13 55 LMP Okay. Feel how heavy this thing is.

05 15 14 01 CDR Wait a minute, wait.

05 15 14 03 LMP Okay.

05 15 14 04 CDR Wait a minute. There you go.

05 15 14 08 LMP All right. Now do it.

05 15 14 10 CDR I'm going to have to use the pull-in feature; just a second. All right, ready?
Go.

Give her one big heave.

Made it.

Okay. I can't see. That darn Sun is in --

Can you take up some tension and I'll pull it in?

Got it.

That's it.

Rock box 2 is in, Houston.

Roger. Rock box 2 in.

And am I filthy dirty from that LEC. Wow, wow, wow!

Okay, Pete. Go ahead.

(Humming) ... getting in and out of these shadows really gets eerie looking. Okay, Al, if you'll wait just a minute. There you go.

Okey-dokey.

Coming in. Okay, just a second. Passing over the thing.

You'd better believe it.

I can't see.

Okay, pull up a little bit and I'll bring it in.

The Sun's shining right in my eyes.

That's it.

In?

It's in.

Beautiful job; just throw the LEC out. Okay, Houston. ETB is in with the camera and all the film, and so forth and so on.
Roger, Pete. Copy you got the ETB in with the TV camera, closeup stereo, and the film packs.

Okay, now, Pete, here comes the LEC, so watch out.

All right (laughter).

Man, that really comes out, doesn't it? Gee, that went 50 feet.

Okay, let's see. Have I forgotten anything? Forgotten anything?

Pete, you didn't roger the film pack. Do you have all the film packs and the closeup stereofilm, as well as the TV in that ETB?

Okay. Closeup stereofilm was in the ETB, two black-and-white magazines and one camera. I threw the other camera away because it was broken — went up. And the TV camera went up, so I believe we've got everything, Ed.

Okay. You got the — Also the one camera which had the third film pack on?

The third film pack never got used.

Yes, it did too, Pete.

Oh, did you?

Yes.

Oh, I'm sorry. Okay, we got three film packs and one camera up there right now. How's that?

Did you send the film back up?

Yes.

Okay, we sent all three film packs back up. Oh, oh, oh, oh. There is something I wanted to — That's my low water pressure, Houston. I just turned off my water. That's good.

Stand by on that, Al. Pete, also how about the tools?
05 15 18 58 CDR  Yes, sir.
05 15 19 21 LMP  You might want to turn off your water too, Pete.
05 15 19 24 CDR  Yes, I was sitting here thinking there was something I ought to do. Mine's off.
05 15 19 40 LMP  Okay. Out of your way.
05 15 19 43 CDR  Okay. Houston, I guess you can mark me off the lunar surface; I'm on the footpad.
05 15 19 59 CC  Roger. We got that, Pete, at 3 hours and 50 minutes into the EVA.
05 15 20 09 CDR  Okay, up on the ladder I come, Hi-ho, hi-ho, hi-ho. Roy, I'll tell you, Al, that LEC really got me dirty.
05 15 20 22 LMP  Yes, it flips that dirt all around.
05 15 20 46 CDR  Hi-ho. Oh, wait a minute; I know what I want to do. There we go.
05 15 21 06 LMP  You want to give me that piece of paper?
05 15 21 08 CDR  I couldn't get it up. I dropped it.
05 15 21 10 LMP  That's too bad.
05 15 21 12 CDR  Okay, Houston, that's my PLSS feedwater, no sweat.
05 15 21 15 LMP  Head down, come down. That's better. Move to your left slightly.
05 15 21 20 CC  Roger, Pete.
05 15 21 21 LMP  That's it; come on in. Come to your left a little bit. Okay, come on up. Little more to the left. Just right.
05 15 21 34 CDR  Huh?
05 15 21 35 LMP  You're just right. Scoot in there. Got to kind of scoot a little bit further in. You got it made. Bump into me, now. Okay. Okay.
05 15 21 53 CDR  ... let me close the hatch.
... out of the way, and I wonder what that's from.

What?

That little ... maybe ...

I think that came from off of the landing.

Lock her up, babe; you are nice and clean. Gordon will be glad to see you.

One hatch closed.

Okay, check that for AUTO; I think it is, but you can see it down there.

Yes. I'm flipping. You just - Go to hatch AUTO.

Yankee Clipper, Houston.

Okay, let me move out of the way.

Both to AUTO? Tell me when - lighting: ANUNCIATOR and NUMERICS, BRIGHT.

Wait a minute.

Okay. CABIN REPRESS valve, AUTO. AUTO.

PRESS REG's A and P, CABIN; MASTER ALARM will come on, and cabin warning light. Okay, here comes the O₂. And the pressure is rising. Looks good right this minute. Okay, that's normal. PLSS O₂, OFF.

Say again.

PLSS O₂, OFF, when you get to 3.1.

I can't get mine. Can you get it?

Let me see if I can.

I can't get it, Al.

Just a second. Let me get mine, too.

Okay? Could you get mine off?
Roger. ... Just a second.
I can't hear you.
Your O₂ is OFF.
Everything's off, Pete. And the cabin pressure is --
Cabin, 4 pounds.
Okay, you want me to turn the ... off?
That's it, that's it, babe. ... the checklist.
I hope that seal is good.
Say again.
I didn't check that seal real closely.
I didn't either.
Okay. It says here: Verify cabin pressure increasing. Now, let me tell you. PLSS O₂, OFF; activate OPS PURGE valve to DEPRESS, suit as required.
Ah, that's better. Hey, don't take your helmet off!
That's right.
Just your gloves.
Do we do that?
Yes, we do, because we have to put on our other ones.
Okay. Okay, let me read you.
Yes. Okay.
Okay, just a second. SUIT FAN 1 is closed.

SUIT FAN DELTA-P, closed. Okay. They're going to get some ECS CAUTION and H₂O SEP component lights out.

I can't hear you. What?

ECS CAUTION and H₂O SEP component lights will go out in a minute. Doff your glove.

Everything's out.

Okay. That H₂O valve open? Okay, that's a good idea boy. Purge valves --

Now, we don't have anything left but a little rendezvous (laughter).

Ascent and rendezvous, babe.

Give me your purge valve fitting; I'll put it in the TSB. Okay, let me give you my purge valve. Okay?

You got it.

This suit stuff has got all that dirt on it; I think it's - is this mine?

There you go, Pete.

I can't turn it ...

Sure, sure. ... purge valve because it has to rotate with the other. Got your ...? Let's find it.

I know. Here somewhere. Is that H₂O valve open? Turn it over.

Purge valve and OPS O₂ hose, stow purge valves in TSB.

Just throw it in there, I'll find the ball.

Oh, may have thrown it over. May be behind you.

..., these things won't come undone.
I think they got a lot of that dust on them.

Here, would you turn this, please?

Yes, I sure will. There you go.

I don't understand why I can't ... there.

Okay.

They're sticking.

Connect your LM hoses. Red to red; blue to blue. ... so I'll hand you your hoses, Pete.

So far, we haven't touched one of those circuit breakers as far as I can tell, around in here.

There's your hoses, Pete. Got them?

Yes. Okay. Here's mine. Okay.

Red to red; blue to blue; ISOLATION, both to SUIT FLOW.

Okay, would you turn mine on? Thank you.

Got it.

Does that feel good!

Okay. Let's get to the PLSS PUMP, OFF; and FAN, OFF; and the backpressure in your fan.

Okay, that's good.

Disconnect PLSS H₂O from PGA; connect LM H₂O.

I'll get yours and you get mine.

Lift up your RCU a little bit, Pete. RCU, there you go.

That did it. That did it. ...

Okay?
<table>
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<tr>
<th>Time</th>
<th>Message</th>
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<tr>
<td>05 15 30 49 LMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>05 15 30 50 CDR</td>
<td>LCD PUMP, in.</td>
</tr>
<tr>
<td>05 15 30 53 LMP</td>
<td>Okay. You're going to get two of them, probably. Do you see them?</td>
</tr>
<tr>
<td>05 15 30 55 CDR</td>
<td>PLSS MODE, both of them 0, up.</td>
</tr>
<tr>
<td>05 15 31 01 LMP</td>
<td>Okay. Hello there.</td>
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<tr>
<td>05 15 32 06 LMP</td>
<td>Okay, turn your VHF A, OFF, and B, OFF.</td>
</tr>
<tr>
<td>05 15 32 09 CDR</td>
<td>A, OFF and B is OFF.</td>
</tr>
<tr>
<td>05 15 32 10 LMP</td>
<td>MODE, ICS/PUSH-TO-TALK.</td>
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<tr>
<td>05 15 32 14 CDR</td>
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<tr>
<td>05 15 32 16 LMP</td>
<td>Okay, RELAY, OFF.</td>
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<tr>
<td>05 15 32 17 CDR</td>
<td>My RELAY is OFF.</td>
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</table>
05 15 32 18 LMF You're out of VOX, right?
05 15 32 19 CDR Yes, sir.
05 15 32 20 LMF Okay.
05 15 32 21 CDR Hello, Houston. How do you read?
05 15 32 25 LMF COMM, Okay? VHF, OFF, OFF.
05 15 32 31 CDR OFF. Hello, Houston; Intrepid hooked up on
the Intrepid system. How do you read?
05 15 32 39 LMF They never told us to turn our tape recorder on.
05 22 21 31 CDR Okay. You're on your way.
05 22 21 33 LMF Okay.
05 22 21 43 CC We got it, Dick. Go ahead.
05 22 21 45 CCF Roger. I've got some good torquing angles here.
I guess you really don't need them, do you?
05 22 21 54 CDR We read you, Dick. Do you read us?
05 22 21 56 CC Negative. We don't need them.
05 22 21 58 CCF That's affirm. I read you now, Pete, loud and
clear.
05 22 22 03 CDR Okay, he should be looking. He should be looking
right at it - -
05 22 22 05 LMF I'm ready when you are, babe.
05 22 22 08 CDR Okay. There's a - an ENTER. There's a PRO, 54.
05 22 22 16 LMF Okay.
05 22 22 20 CDR What do you want?
05 22 22 21 LMF I'm letting it drift just a minute. Okay.
Pitch up and left.
05 22 22 27 CDR That's enough. That's enough. Now that's one
pulse; that's it.
05 22 22 31 LMP I know it. Down and right.
05 22 22 45 LMP Up and left.
05 22 22 55 LMP That did it.
05 22 22 56 CDR Okay. There you go. Beautiful, Al.
05 22 23 03 LMP Stick with me, babe.
05 22 23 04 CDR Okay, Houston. Are you looking at the DSKY? There are the torquing angles.
05 22 23 14 CC Roger. We're looking at them, Pete. Sterling.
05 22 23 18 CDR Okay. Okay. We're going to PRO.
05 22 23 23 CC Yankee Clipper, Houston. Over.
05 22 23 26 CMP Go ahead.
05 22 23 27 CDR Turn up the lights, Al. Floodlights in, please.
05 22 23 30 LMP Coming on, babe.
05 22 23 31 CC Roger, Dick. How about turning down your S-band thumbwheel and make a VHF check? And, if you're in good shape on VHF, we're going to break down this relay again.
05 22 23 38 CMP He's breaking now, Jerry; I can hear them now.
05 22 23 42 CDR Okay. Which one you hearing us on, Dick? A or B?
05 22 23 47 CMP Are you supposed to be on RANGING right now? I thought you were supposed to be transmitting on A.
05 22 23 53 CDR That's where we were a while ago. Nothing's changed.
05 22 24 03 CDR Let's get them the antenna.
05 22 24 21 LMP You get one of these straps on, babe?
05 22 24 39 CDR There we go. Keeps me in my corner.
05 22 24 45 LMP Be with you in a minute, Pete.
05 22 25 07  CMP   Intrepid, Clipper. I have you in my big eye.
05 22 25 16  CDR   Okay. That's good.
05 22 25 23  CDR   Okay. Now you've got --
05 22 25 24  LMP   Can you put that thing down so I can read it, Pete? Thank you.
05 22 25 45  LMP   Okay. Would you pull the AOT LAMP, Pete?
05 22 25 51  CDR   Huh? Oh, AOT LAMP. Yes.
05 22 25 58  LMP   Okay. ... your radar.
05 22 26 05  CDR   Okay.
05 22 26 06  LMP   Okay.
05 22 26 14  CDR   Dick, I hold you at 351 feet a second at 200 miles.
05 22 26 30  LMP   Okay, Pete. There's going to be a noise. I'm go -
05 22 26 32  CMP   I concur on that, Pete.
05 22 26 34  CDR   Say - say again, Dick.
05 22 26 36  CMP   I concur. I concur.
05 22 26 38  CDR   Okay. I'm just starting P20.
05 22 26 41  LMP   Go back in EGRESS, Pete.
05 22 26 43  CDR   Okay.
05 22 27 02  CDR   417 plus 1.
05 22 27 05  LMP   2.6 and nothing.
05 22 27 08  CDR   Okay. Excuse me.
05 22 27 10  LMP   Just a minute. 2.6, that's a nothing.
05 22 27 21  CDR   What do you need?
05 22 27 23  LMP   You'd have to see it, Pete (laughter).
I'm sorry. You're - get - get a number. It's got to be here.

We're in good shape.

I know it; we're in good shape.

Okay.

Stand by for an ARM. Got your CSI PAD? You got it right there, right?

Right there, babe.

Okay. Let me get one more mark in and see what happens. VERB 37, ENTER, 32, ENTER --

Looks like ...

VERB 25, ENTER. Plus 0014.2.

Wait, wait, wait, wait.

No. You're running. Plus 0014.3.

3. 1?

That's right. And 050 --

05060 --

That's it, babe.

ENTER. Okay. When do we lose the high gain?

Just a few seconds. Houston, Intrepid. We're going to go over to OMNI's now.

There's PCM in LOW.

Down.

Antenna -

Intrepid, Houston. You've about 45 seconds from LOS.

That's good.
05 22 28 55  LMP  I was glad I reminded them.  S-band --
05 22 29 00  CC    Intrepid, Houston.  We'll see you at 143:16.
05 22 29 05  CDR  Roger-Roger.
05 22 29 09  CDR  Okay.
05 22 29 11  LMP  Excuse me, Pete.
05 22 29 12  CDR  Now, I need the TPI time minus - TPI time.  144 --
05 22 29 20  CC    Intrepid, Houston.  Your --
05 22 29 22  LMP  38.
05 22 29 23  CC    -- CSI DELTA-V is going to be about 46.5.  Over.
05 22 29 27  CDR  Roger.  46.5.  Just write it anywhere.
05 22 29 32  LMP  Okay.
05 22 29 33  CDR  Okay.  Now.  144:38 --
05 22 29 37  LMP  38, 00.
05 22 29 40  CDR  Okay.  ENTER.  All zips.
05 22 29 43  LMP  Okay.
05 22 29 44  CDR  And we're on our way.
05 22 29 46  LMP  ... plus 19.
05 22 29 49  CDR  We are on our way.  Want to get a clock countdown there?
05 22 29 53  LMP  Okay, if you'll do that, I'll get one of these marks in I've heard so much about.
05 22 29 56  CDR  (Laughter) I'll get the clock.  Go ahead.
05 22 30 01  LMP  VERB 83, set ORDEAL.
05 22 30 03  CC    Houston, Intrepid --
05 22 30 04  CDR  Okay, VERB 83 --
05 22 30 05 CC  -- We've got LOS on the Clipper, and we'll see him at 13.

05 22 30 09 CDR  Okay. Say again our AOS time?

05 22 30 17 CC  Your AOS time is 143:16.

05 22 30 21 CDR  143:16, By-by.

05 22 30 24 CC  Roger. Nominal in the flight plan.

05 22 30 28 LMP  Okay; 415 plus 10 000; 31 --

05 22 30 35 CC  Intrepid, Houston. Go LOW BIT RATE.

05 22 30 40 LMP  LOW.

05 22 30 45 LMP  Okay, Pete. When this thing drifts through there, I'm going to punch an ENTER.

05 22 30 49 CDR  ENTER.

05 22 30 50 LMP  Six degrees. There you go.

05 22 30 52 CDR  Clear. Now I need a range, which happens to be 186.

05 22 30 57 LMP  316 plus 01860.

05 22 31 02 CDR  ENTER. Can I do this?

05 22 31 09 LMP  What is it?

05 22 31 10 CDR  Oh, yes, sorry.

05 22 31 11 LMP  Okay, I had it.

05 22 31 13 CDR  On my mark.

05 22 31 14 LMP  Okay. We're on the schedule here.

05 22 31 16 CDR  Six more minutes - which will be 24. We're right on it.

05 22 31 18 LMP  Okay.

05 22 31 22 CDR  Hey, that was a beautiful alignment.
We can do it, babe (laughter).

I'm just sorry that damned thing stuck.

You'd never know I hit it three times and it didn't, and all of a sudden it just did, when I was up there just doing the other.

That's okay. I backed off 32 feet, that's all. Cost us a little gas. So I got interested - I had to stop and think, "What did it mean?"

I need to chart the R-dot.

And I went right through that 100 feet per second, that's all.

What's the R-dot?


There you go.

What straps are holding you down? All of them?

Yes. What ...

You got this thing back in EGRESS - in EGRESS again?

Yes, sir.

Something smells terrible in here. You notice that?

Probably in this - Probably all this stuff flying this around, maybe.

Well, but the suit loop's buttoned up.

Yes.

It smells like ammonia.

I don't smell it and I got a real good sniffer.

Okay.
Okay, I'm going to go ahead and take her - a mark here and get on this schedule.

Yes.

415 plus 10 000. ENTER. 80 --

Say, Clipper.

280 --

We're smoking right along; it looks like --

50 --

-- We got a good solution. Tell you what happened to us there. Al went to close the main shutoffs and system A indicated barber pole, and I started to do something with him and I didn't shut off the ascent engine and we smoked overburned about 32 feet, but I backed it all out and looks like we're nominal. What did they give us for a nominal CSI before? 49, right?

Yes, 49.2. The others had a 46 - 503 and that's -- minus 273; 5030 --

Look, is our recorder off?

-- 27330. No, it's on.

Okay.

...

Well, I'll tell you; we're bringing you a dirty, grubby spacecraft.

MARK.

178, CLEAR, 316, plus 01780. I hope we make a good AGS solution here. Like to do it. CLEAR. 415, plus 10 000. Standing by to make the next set of marks. Okay, Pete. Things are looking good. Man, it was spectacular looking out. You should have seen that descent stage - that - all that jazz.
I saw it.

Did you? And then it - when we pitched over, I could see the descent stage like you said.

Yes, I couldn't see it. That camera stopped. It would've been fantastic. I don't know when it stopped --

Son of a bitch --

File of junk.

Really pisses you off, doesn't it?

It does, that's a fantastic thing to show somebody.

27. I'm going to take an R-dot right here. Clipper, that'd be 253, 254, 252, CLEAR, 503, minus 0, 2540.

Two more marks and I'll get a look at a solution for you.

Okay.

ENTER. 173, 873 miles, 73 miles, CLEAR.

What'd you do, break lock, Dick?

... You see us lift off?

Negative.

Hey, ... See that? It is working.

Okay.

That main shutoff valve has done it again.

I got to ask Dick something and see if he'll do something for me. Hey, Dick. Call me back when you got - have about 2 or 3 minutes.

...
How about giving me a long count?

Roger. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10; 10, 9, 8, 7, 6, 5, 4, 3, 2, 1. Over.

Okay. Do you hear me okay?

Yes. I hear you fine.

Roger. Is your ranging on?

Yes. It's okay.

Okay, babe.

How's ... down there; I'm locked on again.

168.2, CLEAR, 503, minus 1682, ENTER. I did that wrong. I bombed that damn AGS right there.

What did you do?

I entered a RANGE instead of a RANGE RATE. Let me see what it says - let me see what it says. R-dot. See, bombed the hell out of it.

Well, put it right back in again. It won't bomb it. Hurry. Put in - push a right RANGE RATE in.

It won't work.

Why?

Watch it. It drives it way out, there's no way to bring it back. Just give me an update.

All right. I can't do it right now.

Whenever you can.

All right, here, let's copy this down; 16.8 DELTA-H.

Wait a second. 16.8.

58:11.
05 22 38 28 CDR 37:59.
05 22 38 31 LMP Okay.
05 22 38 32 CDR PRO.
05 22 38 37 CDR 47.0.
05 22 38 38 LMP 47.0.
05 22 38 40 CDR Okay, Dick. My first solution is 47.0.
05 22 38 43 CMP ......
05 22 38 47 CDR Okay, my CSI-CDH looks like minus 7.9 and minus 8.3.
05 22 38 57 CDR Okay, we're counting.
05 22 38 58 LMP Okay.
05 22 38 59 CDR Okay, I'll looksee.
05 22 39 07 CDR Where'd that -0 VERB 90 at 15. Okay.
05 22 39 09 LMP Give me - give me an update, would you? Just a second, just a second.
05 22 39 15 CDR HIGH BIT RATE. What a dope!
05 22 39 19 LMF Okay, go. If we start new, maybe I can do better.
05 22 39 29 CDR All right. I can't hardly tell the difference between one-sixth g - -
05 22 39 40 CMP Okay. Sounds good. I'll be working on out-of-plane here for you.
05 22 39 48 CDR Okay, Dick. You say you're working on the out-of-plane. You're very garbled.
05 22 39 55 CMP Roger. Give me the CSI time again.
05 22 39 58 CDR CSI time, 143:01:50.60.
05 22 40 07 CMP Okay. I - I got my attitude.
05 22 40 21 LMP  Can you look here, Pete?
05 22 40 38 LMP  Do it right this time if it hurts. 162, .... Son of a bitch, beat you yet. Going to get a ...
05 22 41 16 CDR  Coming up on 20.
05 22 41 27 LMP  Guess if we really did run it on AGS alone, I'd have to do the charts right now.
05 22 41 50 LMP  VERB 67.
05 22 42 03 CDR  Okay.
05 22 42 04 CMP  Hey, Pete, your out-of-plane is plus 1.8 feet per second.
05 22 42 09 CDR  Okay. Well, forget it.
05 22 42 39 LMP  59, CLEAR, 6 plus 0, 590. Hit her.
05 22 42 51 CMP  And I had to circle ... AUTO ...
05 22 42 54 CDR  How much?
05 22 42 56 CMP  A third of a mile.
05 22 42 58 CDR  A third of a mile?
05 22 42 59 CMP  That's affirmative.
05 22 43 00 CDR  Okay. You're very garbled.
05 22 43 09 CMP  How do you read me now?
05 22 43 11 CDR  Just a little bit better, but you're still --
05 22 43 12 LMP  Check RCS, EPS, and the whole smash.
05 22 43 14 CDR  -- garbled.
05 22 43 15 CMP  ... ...
05 22 43 18 CDR  Okay.
05 22 43 20 LMP  Hey, why are we using so much system B?
05 22 43 23 CDR  Probably because that's what we're on.
Okay.

We're on - we're on 11.

Are we in the right DAP, you suppose?

System B. I'll switch it. Can't switch it?

...

..., Pete.

You're hard to read, Dick, babe.

What did you ... after CSI?

It had 46.5, Dick.

It did?

Where'd we go?

Huh? Oh, no, I just let it - I'm flying it. I was just trying to save some gas.

Yes, well, we're off ... Wonder why it's using so much?

I don't save a hell of a lot of gas. That system was low when we started.

I'm going to go back into AUTO here.

I think the thing to do - I think one of the things we might want to do - -

I'm in the 1-degree deadband.

Bugs me.

I'm ... in ... 38.8 ... 

How much, 48.8?

38.8.

38.8. That's not very good, Dick.
05 22 45 39 CMP Just a minute ........ there.

05 22 45 48 CDR We - we agree almost exactly with the ground.

05 22 46 34 LMP DPS and ECS; CPS and ECS. What a dope.

05 22 47 16 CDR You're sure doing a lot of thinking. Forget it.
I show 0.26 miles out of plane, Dick, and minus 0.4, so I'm going to forget them.

05 22 47 38 CMP Got that.

05 22 47 41 CDR Hey, I'm going to let this go to 8 minutes.

05 22 47 44 LMP Okay.

05 22 48 06 CDR I was dumbhead for letting that son of a bitch overspeed, wasn't I?

05 22 48 10 LMP Both of us were dumbheads.

05 22 48 13 CDR Huh?

05 22 48 15 LMP Both of us --

05 22 48 16 CDR Hey, that was a no sweat. You know that?

05 22 48 18 LMP Sure, it was a no-sweat.

05 22 48 19 CDR And you know what we should have done --

05 22 48 22 LMP We should have briefed for just that.

05 22 48 25 CDR All you had to do was close them anyhow and leave that crossfeed open.

05 22 48 29 LMP But I said - you didn't hear me say it?

05 22 48 30 CDR Yes. I - I just freak. That's me - I freaked up. I should have left you alone over there and stayed on my own business. My fault.

05 22 49 19 CDR Turn down the floods out a minute.

05 22 49 20 LMP Just a second, please.

05 22 49 32 LMP Boy, is that him?

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05 22 49 36  CDR  Got a goddamn star out there.
05 22 50 26  CDR  We're not in bad shape. What have we got? 80, 66.
05 22 50 41  CDR  Tell you what, if you want to even them up, we can crossfeed during this burn.
05 22 50 45  LMP  Okay.
05 22 50 54  CMP  ...... 
05 22 50 57  CDR  Darn it, Dick, you're unreadable. Say again.
05 22 51 01  CMP  Loud and clear. I was just ... to Houston, right now.
05 22 51 04  CDR  Oh, okay. You got a flashing light on or anything?
05 22 51 13  CMP  No. I've got the overhead EVA lights and the rendezvous lights on.
05 22 51 17  CDR  And we're still 150 miles away or something.
05 22 51 23  LMP  Give me an R and R-dot, would you, Pete, in 10 minutes.
05 22 51 26  CDR  R and R-dot in 10 minutes --
05 22 51 27  LMP  That's right.
05 22 51 28  CDR  Okay.
05 22 51 33  CDR  R's going to be --
05 22 51 34  LMP  Hey, I like this.
05 22 51 36  CDR  Yes.
05 22 51 42  CDR  R-dot's going to be 1 -- Let's see, it's going to be 71; no, it might be 70.
05 22 51 48  LMP  Well, let's hope the old probe works.
05 22 51 51  CDR  MARK.
05 22 51 52  CDR  148.2 at 70 feet per second.
05 22 51 57  LMP  I'm doing it. I've got a thru - 70, 76.
05 22 52 01  CMP  Okay, Pete. I got 45.9 feet.
05 22 52 06  CDR  45.9. That sounds a lot better. Okay.
05 22 52 13  CMP  .... ....
05 22 52 16  LMP  Okay. I'm going to final COMP in one more mark; just a second, it's coming up now.
05 22 52 24  CDR  That'd be 44.9 converted.
05 22 53 03  LMP  I get 45. - 45.0 off the chart.
05 22 53 09  CDR  Okay.
05 22 53 15  LMP  That's not too bad.
05 22 53 16  CMP  Al, am I supposed to maneuver?
05 22 53 18  LMP  What? Yes, go ahead and maneuver.
05 22 53 21  CDR  Maneuver yourself --
05 22 53 22  CMP  Okay.
05 22 53 27  LMP  Eight minutes.
05 22 53 42  CDR  There it is. 17.5 DELTA-H, 58:11 --
05 22 53 47  LMP  Wait, wait --
05 22 53 48  CDR  -- and 3758.
05 22 53 50  LMP  Wait.
05 22 53 51  CDR  Got it?
05 22 53 52  LMP  No.
05 22 53 53  LMP  5811?
05 22 53 55  CDR  Yes.
05 22 53 56  LMP  3758. Go ahead.

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05 22 54 00 CDR  Okay, Dick, I got 45.3 feet per second.
05 22 54 04 LMP   Okay.
05 22 54 09 CDR  Okay. Minus 9 and minus 11.4. Do you want 82?
05 22 54 15 LMP   Yes, I do. One minute.
05 22 54 17 CDR  Minus 9.7, minus 11.4.
05 22 54 21 LMP/CDR  Okay.
05 22 54 22 CDR  Better get ready for the burn.
05 22 54 24 LMP   Okay. Seven minutes.
05 22 54 27 CDR  I like to get ready.
05 22 54 28 LMP   410 plus 50 000 ... both DELTA-V's.
05 22 54 41 CDR  Did you get any NOUN 86's? There you go.
05 22 54 48 CMP   How you're doing?
05 22 54 50 CDR  Oh, we're okay, 45.3. We'll be burning in about
                6 minutes, got a good system, no reason to think
                we're not going to burn.
05 22 54 57 CMP   How you doing down there?
05 22 54 59 CDR  We're doing fine. How are you? You read me,
                Dick? Hello, Dick. Do you read me?
05 22 55 12 LMP   He doesn't read. He --
05 22 55 14 CDR  Hey, should we be on some other antenna?
05 22 55 18 LMP   Forward.
05 22 55 20 CMP   ... ...   
05 22 55 21 CDR  Oh, okay. Very good. I'm about to lose my radar
                on you.
05 22 55 33 LMP   Do you mind if I have NOUN 85 back?
05 22 55 36 CDR  I don't mind a bit, if that's what you need.

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05 22 56 06 LMP Pretty full one.
05 22 56 16 CDR Why, you want to crossfeed?
05 22 56 19 LMP Yes.
05 22 56 21 CDR Open the crossfeed.
05 22 56 23 LMP Close system B.
05 22 56 25 CDR Close system B.
05 22 56 26 LMP Now, just hope like hell system A is really and truly on. Let's watch these pressures.
05 22 56 46 CDR How you read me, Dick? Okay?
05 22 56 48 CMP Loud and clear, Pete.
05 22 56 49 CDR All right. Five minutes to the burn.
05 22 56 51 LMP Okay.
05 22 56 52 CMP Okay.
05 22 57 03 CDR Boy, I really like to watch those thrusters fire out there. That's neat-o. When do we - when do we come out in the sunrise?
05 22 57 14 CMP Right after - right after we see the Sun.
05 22 57 17 LMP Okay. I'm not so mad at myself anymore.
05 22 57 20 CDR Why?
05 22 57 21 LMP I've written those down, and I solved this thing.
05 22 57 23 CMP ... for my P56.
05 22 57 27 CDR Say again.
05 22 57 28 CMP ... ...
05 22 57 32 CDR 45.3, is that right, Al?
05 22 57 34 LMP That's right, 45.3.
05 22 57 38 CMP That's a plus 45.3, zips in, huh?
05 22 57 42 CDR That's right. I think you got to add one to it or something. I know we have to subtract one from yours.

05 22 57 47 CMP I already did.

05 22 57 48 CDR Not bad. ... --

05 22 57 50 CMP ... ... on mine, though.

05 22 57 55 LMP 144.

05 22 57 56 CMP ... - minutes to the burn in 7 seconds.

05 22 58 44 CDR Three.

05 22 59 01 CMP How are - you look about half a degree.

05 22 59 03 CDR Oh, yes. We're all set to go. No sweat, it says here in fine print.

05 22 59 13 LMP I did the DELTA DELTA-T and got 45.1, by using the DELTA DELTA-T thing.

05 22 59 20 CDR Not too bad for a dope.

05 22 59 22 LMP I'm going to do better next trip.

05 22 59 25 CDR Well, you been lonely without us?

05 22 59 28 CMP Well, just a little bit. I've been cleaning up for you.

05 22 59 34 CDR Man, we're going to dirty it up, pal. I'll tell you, we'll do our best, but we are filthy. I don't really think it's that bad, though. Most of it will stay in the LM.

05 22 59 48 LMP I hope to heck it does.

05 22 59 50 CDR Okay, Dick, 2 minutes to burn.

05 22 59 52 CMP I hear you.

05 22 59 57 CDR I see your flashing light out there, now.

05 23 00 07 CDR No, I don't either.

05 23 00 17 CDR Look at that ORDEAL; it's right on the money.
05 23 00 20 LMP  Look at your inertial ball; it's showing right on the money, too.

05 23 00 22 CDR  Yes. Everything's look good right this minute.

05 23 00 28 CMP  ... you're breaking up.

05 23 00 29 CDR  Say again. We're breaking up?

05 23 00 46 CDR  Oh, I know. You know, I spotted what I think is Dick. There's a piece of Kapton or something floating in front of the spacecraft and our flashing light flashes off it. Okay, Dick, I'll be burning in about -

05 23 01 00 CDR  MARK -

05 23 01 01 CDR  - 50 seconds.

05 23 01 16 CDR  DSKY's blank. Aver - average g. Twenty seconds. How do you read me?

05 23 01 31 CMP  ...

05 23 01 34 CDR  Not yet. No. Another 15 seconds. Wait a minute; here we come. 10, 9, 8, 7, 6, 5, 4, 3, 2, 1.

05 23 01 50 CDR  We're burning; we're burning. We're burning now, Dick. How do you hear? Burning good.

05 23 02 03 CMP  How are you doing?

05 23 02 04 CDR  Just fine. Just fine. Burn is good, Dick. Burn is good. How do you hear? Half done.

05 23 02 13 LMP  We agree.

05 23 02 14 CMP  ...

05 23 02 15 CDR  Just fine. Just fine.

05 23 02 18 CMP  ...

05 23 02 19 CDR  That fine, Dick. Fine. Very good.

05 23 02 23 LMP  You're nearly there, babe. You just let me burn them out.
05 23 04 00  CDR  God damn it! Write this time down. 144, all zeros --

05 23 04 07  LMP  Okay. Just a second.

05 23 04 09  CDR  Hello, Dick. How do you read? Over.

05 23 04 11  CMP  Loud and clear.

05 23 04 12  CDR  Okay. Now, look, something's screwy on this COMM --

05 23 04 13  LMP  Burn's complete.

05 23 04 14  CDR  Burn's complete.

05 23 04 15  LMP  We got the burn's complete.

05 23 04 16  CDR  Our burn's complete. Our burn's complete.

05 23 04 19  CMP  Okay, you're cutting in and out pretty bad. ...

05 23 04 23  CDR  Say again.

05 23 04 24  CMP  You're cutting in and out pretty badly.

05 23 04 27  CDR  Okay. Now, look, I'm transmitting to you -- Now, come on, god damn it.

05 23 04 30  LMP  Look, let me get the COMM right. Do you want me to get the COMM right or not? Something's wrong with it. Okay. I'll just leave it like it was.


05 23 04 46  LMP  It's in your G&W --

05 23 04 47  CDR  I got it, never mind. Could not read radar. All right. God -- god damn, I know what the hell's the matter here.

05 23 05 01  LMP  Lost lock, no?

05 23 05 04  CDR  No, I know what's the matter. Shit, I -- freaking around with that stupid COMM. Now, he's got it. All right, will you write this number down?
05 23 05 18 LMP I sure will.
05 23 05 21 CDR Three, six, ... 144, all zips, 1.53, that's CSI time.
05 23 05 32 LMP Okay.
05 23 05 38 CDR Dick, how do you read?
05 23 05 40 CMP I'm through, now.
05 23 05 41 CDR I'll be goddamned if I know what's wrong with it. Stupid son of a bitch. All right, we're in sunlight. Our CS - CDH time is 144:00:1 --
05 23 05 52 LMP 5.2.
05 23 05 53 CDR No. One second point 53. 1.53.
05 23 05 59 CMP Say it again. 1 point zero --
05 23 06 02 CDR 00:01.53.
05 23 06 09 CMP What time do you want the ...?
05 23 06 14 LMP Just a second. I'll figure it out.
05 23 06 28 CDR What in Christ's name is this?
05 23 06 30 LMP How about --
05 23 06 32 CDR What the hell happened to the reset - the - We're not going back to 10 010, are we?
05 23 06 43 LMP Pete, do you want me to put 143:30 as the plane-change time?
05 23 06 47 CDR That's fine, if that's what it's supposed to be.
05 23 06 50 LMP Okay. Well, that's rounding off to the nearest --
05 23 06 52 CDR Now, what happened to the damn - Hey, Dick, how about a plane change time of 143:30? Over.
05 23 07 00 CMP That sounds good.
05 23 07 02 CDR Okay. That's the one. Oh, there it is. I'm looking on the wrong page.

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' CONFIDENTIAL

Okay.

Boy, that COMM makes me mad.

Does me too. That's why I wanted to try to figure it out there for you.

No, but see, I got a PROGRAM ALARM and a TRACKER LIGHT --

Okay.

-- and a bunch of other crap.

How about giving me an AGS update?

Just 1 --

When you can.

-- 1 second.

Are you in ...?

Yes, we are.

Yes. Sure are, Dick.

Now, look, I got the VHF in FORWARD and that's where we've been flying it, and it worked great. Only today, it ain't working so great. Why, I don't know.

VERB 47, ENTER. There you go.

Wait a second. Wait a second. Go.

Hey, Dick, it never fails to do that. I'll be goddamned if I know. We're talking to you fine up until 1 minute, and then you can't hear me. Now, it could be that, when I'm burning, my thrusters are doing something that's blocking that VHF.

The only trouble is, he goes out even before you start burning.

... too, Pete.
Day 6

05 23 08 44  CDR  But I think you and I have very poor COMM with one another, today. I can hardly understand understand you; you're so garbled. Hey, pull that thing to PUSH/CABIN and let me - I want to blow my ears a minute.

05 23 09 02  LMP  I can't PUSH/CABIN be --

05 23 09 04  CDR  Well, yes, I go to ear. Never mind, stand up. I get it. I'm sorry. I'm asking you to do too much. You play with your AGS. I'll do it. I shouldn't get spastic over here, but that freaking PROGRAM ALARM pissed me off. They come up in the middle of that thing.

05 23 09 42  CDR  Okay. Now. What time do we burn - CSI was 1 - 143:03, right?

05 23 09 58  LMP  Yes.

05 23 09 59  CDR  01 --

05 23 10 00  LMP  No, let me tell you.

05 23 10 01  CDR  So, you came up with a time of - for the plane change of -

05 23 10 07  LMP  143:01:50. Okay. Then you told me CDH was going to be 144:00:01.53, right?

05 23 10 14  CDR  Yes.

05 23 10 15  LMP  I subtracted 30 minutes and rounded it off to 140 and asked you 140 --

05 23 10 19  CDR  Okay.

05 23 10 20  LMP  330.

05 23 10 21  CDR  Yes. Say, let me - let me just - let me just check something.

05 23 10 31  LMP  No. Wrong book.

05 23 10 53  LMP  Do you want me to set your clock counting down?

05 23 10 56  CDR  Yes. We got plenty of time. This is a long haul.
05 23 10 59 LMP Yes. I know it. This is a good one. Just trying to get organized, here.

05 23 11 01 CDR Yes. Now, I'm - No sweat.

05 23 11 07 LMP This job is a son of a bitch, yet. Don't knock the time; I've - I've set it for you.

05 23 11 19 CDR Oh, wait a minute. Wait. Go ahead.

05 23 11 21 LMP Okay. I'll be setting it in 8 seconds, 48:30, counting down. Boy, that Sun is hot. You got sort of stay out of the way, don't you? The other ... - -

05 23 11 32 CDR You ought to put my window heater back in. See what's happening, here, is we're running on CABIN - we're running on SUIT LOOP.

05 23 11 51 LMP That's right.

05 23 11 52 CDR If we went to - if we get out of this dumb EGRESS mode, we're not going to - Certainly the cabin isn't going to fail, now. We've been in and out - let's get. I'm in CABIN right now.

05 23 12 03 LMP No, you just went to CABIN. Here - -

05 23 12 05 CDR When you pull this - -

05 23 12 07 LMP PUSH/CABIN. There you go.

05 23 12 09 CDR Of course, we could screw up the - we could screw up the suit loop, couldn't we? If we - -

05 23 12 15 LMP Yes.

05 23 12 16 CDR - - don't follow this crap, and I'd better go back to EGRESS.

05 23 12 20 LMP We need those window heaters, though, just like you say.

05 23 12 22 CDR Yes. It's funny; the other guys never had to use them.

05 23 12 30 LMP Oh. We maneuvering somewhere, huh? No? Okay.
There you go; that's the T at CDH, 1.53. Okay.

Yes.

... see you in the telescope.

You - you see us in the telescope?

Yes.

ENTER, 136.5.

Damn, Dick. Do you - I - I just don't know what in the hell is wrong with this VHF COMM. We should have super COMM. And I'll tell you, it really makes me mad.

Hey, look at this book just a second.

Okay.

All right, I don't even know what I want to look at. I want to look at this --

When you did your P76, Dick, with my burn in it, did you get any NOUN 49's afterwards, or did it come right up with a good state vector?

No. I got a good one. ...

I can't understand you. God darn, you're garbled.

So are you.

Hey, Al, what's - Let's screw around with something over there. How about the VHF squelches or something? Why don't we try that?

No, the squelch only applies to us hearing him. And we always hear him.

Well, he's got squelch over there, too --

That's right, so he should screw with his. It doesn't have anything to do with our transmitter. Since we always hear him, --
05 23 15 08 CDR Yes. Well --
05 23 15 09 LMP ...
05 23 15 10 CDR -- he's transmitting to us on what, A?
05 23 15 11 LMP He's coming to us on B.
05 23 15 13 CDR Okay. Okay, Dick, give us a count, will you?
05 23 15 17 CMP Roger. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.
05 23 15 22 CDR Give us a longer one than that, Dick.
05 23 15 26 CMP ... 5, 6, 7, 8, 9, 10; 10, 9, 8, 7, 6, 5, 4, 3, 2, 1. Over.
05 23 15 41 LMP It's just bad, that's all.
05 23 15 48 CDR Man, oh man, it's taking a long time thinking this over.
05 23 15 53 LMP I'll be with you in a second. ...
05 23 15 58 CDR When do we get AOS, pretty quick?
05 23 16 02 LMP AOS is due right - there.
05 23 16 07 CDR 16. Should be right now.
05 23 16 10 LMP FORWARD, verify COMM. What's our pitch attitude? 147?
05 23 16 17 CDR Pitch attitude is 145. Gosh, I think there is something wrong with my CSI program - CDH program. That baby has really been thinking.
05 23 16 28 LMP Sure you got the right numbers in there? You could --
05 23 16 30 CDR There's no numbers, you know, it just comes up with it. There it is. Look at that. Dick, it shows me 17. mi - 17.1 mile DELTA-H, 38 minutes and 58 seconds to DPI, and it's only a slip of - Well, it makes it 50 - No, it makes it 59 seconds early.
Okay. Sounds good. How are you looking on the out-of-plane ...?

Okay. And it's minus 9 point --

... minus 9.4 feet (cough).

Dirty in here, isn't it?

... 45.3 feet per second, ... 1345.9.

My CDH, Dick, looks like minus 9.4 and minus 8.3.

Why don't you call a NOUN 75, if you could?

There they - No, we're on FORWARD S-band - No, they didn't come, I thought were.

Okay, this plane change is minus 0.4.

Okay, I guess we'll just skip it, Dick.

There we go.

... S-band.

Just got her. Go to SLEW --

Here comes earthrise.

... 

Too bad we don't have a camera.

We do. Where is the earthrise?

Right out your window.

You take it. I got - My window's got - socked in. Just punch the button. Put it on 20 - here, lean over here just a minute. Okay, now take it. Just punch the button on the front.

It would be better if you took it out your window.

CONFIDENTIAL
It's all frosted, Pete.

Intrepid, Houston. How do you read?

I'll get them. Loud and clear, Houston. The burn was good.

Roger, Al. Read you the same.

Residual PGNS were plus 0.1, minus 0.1, and minus 0.3.

You didn't trim those to zero, did you?

Yes, I guess I did. I trimmed to --

Intrepid, Houston. We'd like to know what your DELTA-V's were that you loaded.

Okay.

What do you mean, what the DELTA-V's we loaded? We loaded 45.3 feet per second. Is that what you mean? That was our CSI solution.

Affirm.

Okay. And I've run CDH, here; and it looks like minus 9 and minus 8, roughly. Shows me 59 seconds early at TPI. Okay, and we're not going to make the - That doesn't look like we need to make the out-of-plane. So, we are down in the noise level on out-of-plane. Dick's showing 0.4 foot per second; and I haven't looked at it yet, but I will in a minute.

Roger. Intrepid, Houston. Can you give us a HIGH BIT RATE, please?

That's Charlie.

Do you want me to look at this? 38. ...

Say, Houston, I sure do enjoy flying this thing. It's - Both the ascent stage and the descent stage are both nice. Hey, --

CONFIDENTIAL
05 23 21 52 CC    Roger, Pete.
05 23 21 53 CDR    -- let's square that away, now.
05 23 21 54 LMP    I did.
05 23 21 55 CDR    Oh, you did. I'm sorry.
05 23 21 56 LMP    I'm squared away when they ... --
05 23 21 58 CDR    For -- for your information, I crossfed on the CSI
burn and that sort of evened me up, and I also
switched my DAP load to system A.
05 23 22 19 CC    Roger. Copy.
05 23 22 22 LMP    Let's - no.
05 23 22 25 CDR    And my out-of-plane shows 0.31 miles at 0.3 foot
per second, so I think we'll forget her.
05 23 22 37 CC    Okay, Pete. That sounds good. While you got a
minute, we've got a question about the sequence
camera. Did that camera stop right after lift-off?
05 23 22 49 CDR    Apparently it did, and then it stopped again,
several times.
05 23 22 53 LMP    That's affirmative. It stopped, and I started it,
and it stopped two or three times.
02 23 23 00 CC    Roger.
05 23 23 03 LMP    That's the way it goes.
05 23 23 38 LMP    Clock should be happy.
05 23 23 42 CDR    Huh?
05 23 23 43 LMP    Let me write this R-dot down.
05 23 23 46 CDR    Say, I guess nobody else has -- anybody else had
to use these window heaters before? Our windows
keep fogging over, and I have to run the window
heaters all the time.
Intrepid, Houston. The folks down here say that was pretty nominal for Apollo 11.

Oh, I didn't remember that. Okay. Very good.

Here we go.

Hey, Pete.

Go ahead, Dick.

My CDH time on my computer is 143:59:46.70 - 47.

Okay. We're within a couple - about 15 seconds of one another.

Okay. We're going to use yours.

Okay. 144:00:01.53.

I got it. Thank you.

Intrepid, Houston.

Roger, Pete. I sent you bum dope. 11 did not use their heaters.

Yes. I don't remember anybody having to use them, and both my docking window and - and both Al's window and my window - We've collected moisture on the lunar surface, and we've started collecting it, here, in flight; so, I put the window heater back on.

Roger.

You in po - are you in VERB 76, Pete?

What do you want?

Yes, I want to do it - just --

Okay.

Do you have the needles for me?
05 23 26 04 CDR They're just - have them pass through zero to get it. Here you go.

05 23 26 12 LMP ENTER, 127. CLEAR, 316, plus 01270, and seven 9's.

05 23 26 40 CDR Sure do apologize, Houston, for the overburn. I got my head looking at A1 there, and I just shut her off late.

05 23 26 51 CC Roger. No sweat, Pete.

05 23 27 03 CMP What did he do this time, Pete?

05 23 27 05 CDR Say again?

05 23 27 07 CMP What the devil did he do this time, Pete?

05 23 27 09 CDR He didn't do anything. We had one main shutoff valve stay barber poled over here, and it turned out to be an indicator, but I got interested in that, and I didn't dearm the engine soon enough, and we shut down about 30 feet per second over. That's the reason I had to back her out. No big deal.

05 23 27 30 LMP You on hot mike? ... Okay.

05 23 27 59 CMP Okay, Pete. My first try at it is 18 miles ...

05 23 28 08 CDR S-band what?

05 23 28 11 CMP ...

05 23 28 15 CDR Okay, Dick. You're almost unreadable.

05 23 28 20 CC Clipper, Houston. Your S-band is getting pretty ratty.

05 23 28 44 CDR You got a big clip? Give me a big clip.

05 23 28 47 LMP Okay, just - Take that clip?

05 23 28 56 CDR I'm going to hold that stupid shade from unrolling every time I turn around. Okay.

05 23 29 02 LMP Yes.
Let me look at something here. It took a little jump here, didn't it? Just like - Huh?

- - The simulator.

... 24.5 CLEAR, 316, plus 128:45. AGS is doing good, now. Hey, Pete. Hey, Pete.

Okay, Dick, I'm showing 17.6 with a 36 minute 20 seconds along; and now, it shows me a minute and 39 seconds early. Third magnitude's about the same, minus 10 and minus 8.8. You looking at that recycle on the DSKY, Houston?

We're checking, Pete.

It's minus 10 and minus 8.8.

Intrepid, Houston. We're watching.

How are you doing with your AGS?

Great.

Good.

Thanks for salvaging me.

No problem.

But I got to see it ...; it kept going on those charts. That was great (laughter).

You got to have a recovery mode.

If you tell Jim ... that, he'll flip.

As soon as the Sun gets back over our head, here, which would fill up - shining down in our window - Ah! I see him, now.

Did you see him?

Yes, I think so. Yes. I finally - finally have a visual on Yankee Clipper, I think.
What - what are we? We're 120 ...

Yes, I got you visually, Yankee.

-- 22.3 CLEAR; 16 plus 0 --

Pete, I'm still leading by 122 miles.

Okay, I show 122 on mine, closing at 95 feet a second.

I've done this so many times, I'm getting bored.

I'm not.

(Laughter)

It's doing okay.

That's a great guidance system on that out-of-plane, huh, Dick?

Yes. ... the best. Man, I'm pulling so many marks, I don't know what to do with them all.

I'm the same way.

88.

I got 20 marks in, right now, and 26 minutes to go.

... minus 00980.

... meal last night?

Say again.

Did you enjoy your hot meal last night?

Hot meal? We didn't eat any hot meal.

Ah, come on. ... hot water.

... your hot water? Wish we did.
05 23 34 07 LMP  ... 20 minutes.
05 23 34 08 CDR  Kind of fun to fly, isn't it?
05 23 34 10 LMP  CLEAR, over, 120.
05 23 34 14 CDR  Hey, we're getting up out of the lunar environment or something. The water's beginning to cool off.
05 23 34 23 CDR  Well, I tell you, we got all the gear. Did they tell you?
05 23 34 30 CMP  Yes, ...
05 23 34 32 CDR  I can't hear you.
05 23 34 33 CMP  ...
05 23 34 35 CDR  Good.
05 23 34 38 CMP  ...
05 23 34 44 LMP  74. (Laughter). Just laughing. Look at this dirt in here, would you?
05 23 34 56 CDR  I know. It's phenomenal, isn't it?
05 23 34 57 LMP  You'd ... - you know what - what happened is --
05 23 34 59 CDR  Remember how clean and neat this spacecraft was? (Laughter)
05 23 35 04 LMF  A pile of junk - If those guys - Hey, I better get on the ball here. Minus 102.3, 903, minus 0102.3, ENTER. 415 plus 10 times - Show R-dot at 23 - I've got it. I'll do that. You going to - I - I need to get this thing -
05 23 35 41 CDR  Ole Bean-O's over here updating his AGS, and he's all over -
05 23 35 45 LMF  118.2, 816 plus --
05 23 35 50 CMP  ...
05 23 35 53 CDR  Yes, they'd probably die in Houston (laughter).
05 23 35 56  CMP  ... 
05 23 36 01  LMP  Wait until I get ahold of you, Dick Gordon (laughter).
05 23 36 03  CMP  ...
05 23 36 04  LMP  (Laughter)
05 23 36 11  CDR  Wait until you see - wait until we tell you where we landed.
05 23 36 15  CMP  I saw the ...
05 23 36 17  LMP  (Laughter)
05 23 36 18  CDR  (Laughter) Well, I don't think it looked - You don't know --
05 23 36 19  LMP  Good luck, babe.
05 23 36 21  CDR  You don't know exactly where we were.
05 23 36 24  LMP  (Laughter)
05 23 36 27  CMP  ... close to that rim.
05 23 36 28  LMP  Oh, yes (laughter).
05 23 36 29  CDR  Yes. That's like 20 feet. He's catching on.
05 23 36 36  CMP  ...
05 23 36 39  CDR  Can't hear you. You're really bad COMM. It's a shame.
05 23 36 44  CMP  ...
05 23 36 48  CDR  Yes. Hey, can you back away from your mike a little bit or something? Maybe that's it.
05 23 36 54  CMP  ... COMM ...
05 23 36 58  LMP  Yes, it's the COMM. Very bad, aren't I?
05 23 37 02  CDR  Yes.
05 23 37 03 LMP 106

05 23 37 04 CDR All right, tell Houston that we let - you going to burn the AGS CDH?

05 23 37 07 LMP No (laughter). Scare the hell out of them.

05 23 37 10 CDR Say - say, Houston, Al's working so hard keeping his AGS updated here, why don't we let him burn CDH? (Laughter)

05 23 37 18 LMP Those guys will die (laughter). They're down there - -

05 23 37 26 CC ...

05 23 37 28 CDR Say again, Jer?

05 23 37 32 CC ...

05 23 37 35 LMP They said you got to be kidding. 21.

05 23 37 42 CC Intrepid, Houston. Stand by on (laughter) that. We're consulting our oracle, right now.

05 23 37 46 CDR (Laughter) I'm only kidding, but he's all over the cockpit with that RANGE/RANGE RATE in.

05 23 37 54 CMP ...

05 23 37 58 LMP ENTER. Come on, babe; do a good one. I got the dope. If I muff it again, I can - go to the charts again (laughter). I covered all bets. I think I'll take a look at a recycle here.

05 23 38 18 CDR (Yawn)

05 23 38 19 LMP I think I'll take a look at a range rate of 10-110. CLEAR, 543, minus 0110. 503's range rate is minus 110, ENTER, CLEAR. 115 plus 10 000. Going for 21. I'm going to get this in here. ...

05 23 38 56 CDR I think we ought to rename the Intrepid the Flying Junk Pile. You ought to see it inside this spacecraft, Houston.

05 23 39 03 LMP ... ENTER. 115 miles. CLEAR. 316 - -
Roger. Copy.

316 and 115 miles. It's in there.

It's done. Going for 18 now. I'll check the RCS and everything for you. Looks beautiful, Pete. You know, it's very interesting; every time the thrusters fire, those REG's bounce.

They do. They sure do.

But I didn't notice that before.

I didn't either (yawn). May be just because we're light.

You're right. It maybe just a - be a gage problem. You know the - the needle may just jump.

Do you see him out there?

I'll be darned if I don't.

You don't see him.


Okay. RCS is good. Show 100 percent on - no, we don't - we show 85 on both ... --

Hey, we really haven't used much. You're right. We used most - most of that at launch and the rest of that was just nothing.

Yes, I used it backing out --

That's right.

-- that 32 feet.

That's what did it. 30 feet - whatever it was. Let me look. 18.

It's changing. ... down. Wait a minute; let me get it.
05 23 41 18 CDR Still roughly the same burn, I think.
05 23 41 20 LMP Let - let - let me get in the -
05 23 41 22 CDR What?
05 23 41 24 LMP 117. 
05 23 41 26 CDR Yes, minus 10.3.
05 23 41 27 LMP ... minus 01170.
05 23 41 33 CMP ... 10.3 and 7.3.
05 23 41 37 CDR Okay, I'm minus 10.3 and minus 9.4.
05 23 41 42 LMP Coming up on 18 minutes.
05 23 41 43 CMP ... TPI.
05 23 41 47 CDR My TPI's 2-1/2 minutes early.
05 23 41 51 CMP I got about five more marks ...
05 23 41 54 LMP Okay. I'm going to let her run until 10 minutes.
05 23 42 08 LMP 111 miles. 111 miles.
05 23 42 22 LMP 111 miles. CLEAR, 316, plus -
05 23 42 37 LMP Okay. I'm done.
05 23 42 39 CDR Boy, am I going to be glad to get out of this suit. Whew!
05 23 42 43 LMP I'm almost afraid - Look at that dirt all over the cabin.
05 23 42 46 CDR Yes.
05 23 42 47 LMP Sticking on the windows.
05 23 42 48 CDR No, that's all right, though. That is good, it'll - it'll all get - I'll tell you what, we really ought to let the ECS system suck some of it up. ...
Yes, you're right, because it won't hurt to haul --

Yes, go ahead and go to CABIN on that baby for a while.

I think you're right, Pete, because otherwise we're going to give it to the command module. We don't want that for sure.

Say, Houston, with -- Put it back in EGRESS for a minute. With your concurrence, we'd like to go over into the CABIN mode for a while, stay suited though, but in the CABIN mode, and try and get rid of some of this dirt before we dock. I don't think it's going to hurt the ECS.

Roger, Pete. Stand by.

Don't tell me those filters and canisters get --

Intrepid; Houston. Go ahead. Use the CABIN mode.

Yes. Okay. I'll get it. CABIN, CABIN.

Intrepid; Houston. I have a PIPA bias update to read up for you.

Okay, just a minute.

Are you going to get it?

Okay.

Go ahead.

Okay. VERB 21, NOUN 01, ENTER, 1452, ENTER, 77423, ENTER, ENTER, 1454, ENTER, 00406, ENTER, ENTER, 1456, ENTER, 00777, ENTER. Over.

Okay, let me see if I got those numbers all right. VERB 21, NOUN 01, ENTER, 1452, ENTER, 77423, ENTER, ENTER, 1454, ENTER, 00406, ENTER, ENTER, 1456, ENTER, 00777?
05 23 45 14 CC  Intrepid, Houston. That's negative. Address 1454 should read 00406, and address 1456 should read 00777. Over.

05 23 45 34 CDR  Okay. 1454 is 00406, and 1456, 00777.

05 23 45 45 CC  That's affirmative, Pete.

05 23 45 48 CDR  Okay.

05 23 46 13 CDR  Okay. That didn't work.

05 23 46 19 LMP  Let me help you. Can I read it to you or anything?

05 23 46 23 CMP  Hey, Al. ...?

05 23 46 26 LMP  Yes, I don't think so, Dick, babe.

05 23 46 29 CMP  ...

05 23 46 31 LMP  (Laughter)

05 23 46 33 CDR  That sounds good.

05 23 46 35 CC  Clipper, Houston. Over.

05 23 46 37 CMP  Go ahead, Houston.

05 23 46 41 CC  Roger. I've got some high gain angles for you, Dick.

05 23 46 48 LMP  I wish I knew what was wrong with him.

05 23 46 51 CMP  Go ahead ...

05 23 46 56 CC  Roger. Pitch is minus 23 and yaw is plus 171. Over.

05 23 47 17 CMP  ... I'm going on the HIGH GAIN.

05 23 47 19 LMP  Okay.

05 23 47 43 LMP  Can I read it to you Pete while you do it? Help you any way?

05 23 47 47 CDR  I'm just getting antsy.
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05 23 47 49 LMP  Boy, so am I.
05 23 47 51 CMP  ...
05 23 47 56 CDR  Say again, Dick.
05 23 47 57 CMP  I said ...
05 23 48 03 CDR  Boy I just flat can't understand you.
05 23 48 05 LMP  ... CLEAR, 316 ...
05 23 48 09 CDR  If everything's okay just say, "Okay."
05 23 48 11 CMP  Okay.
05 23 48 12 CDR  Very good. Now there's - don't - don't sweat it if you don't hear from me during this burn.
05 23 48 19 CMP  Okay.
05 23 48 20 CDR  Because it's - everything's stickypoo. I got 32 marks, it ought to be, if this thing's ever going to do anything ...
05 23 48 31 LMP  This AGS is doing pretty damn good, too. Let me look at that book just a minute. Just a minute.
05 23 48 45 CC  Yankee Clipper, Houston. We're going to have a handover, here, now, in your case, from Honeysuckle to Madrid. Over. At 143:50.

END OF TRANSCRIPT