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MSC-07630

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

APOLLO 17 LUNAR MODULE ONBOARD VOICE TRANSCRIPTION

(U) Classification changed to U
By authority of JSC Security Classification Officer by
Date Memo DD 11/9/73
2-8-78 Sally Galter

RECORDED ON THE DATA STORAGE EQUIPMENT ASSEMBLY (DSEA)

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JANUARY 1973

GROUP 4
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SECURITY CLASSIFICATION

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

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

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INTRODUCTION

This document is the transcription of the Apollo 17 flight crew communications recorded on the lunar module (LM) data storage equipment assembly (DSEA). After the multiplexed voice communications and mission elapsed time had been recorded on board the LM on a single track of the tape, the tape cassettes were transferred to the command module (CM) 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 J. L. Gibbons, Test Division, Apollo Spacecraft Program Office, to whom inquiries concerning this document should be referred.

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

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

Therefore, the Apollo elapsed time (the true mission-elapsed time) does not always agree with flight-plan and MCC times. Users of this transcript are cautioned to apply the appropriate time-update deltas for the updated periods. Dashes in the time column indicate that the time could not be determined because of the use of the VOX mode.

Speakers in the transcript are identified as follows:

CDR	Commander	Eugene A. Cernan
CMP	Command module pilot	Ronald E. Evans
LMP	Lunar module pilot	Harrison P. (Jack) Schmitt
SC	Unidentifiable crewmember	
MS	Multiple speakers	
CC	Capsule communicator (CAP COMM)	

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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 voice-actuated (VOX) mode. Words given unusual emphasis by the speaker are underlined.

The Apollo 17 mission was flown December 7 to 19, 1972; lift-off occurred at 05:33:00.60 G.m.t. (12:33:00.60 a.m., e.s.t.) on December 7. The CM was designated America and the LM was called Challenger.

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LM ACTIVATION

04 10 15 15	LMP	Okay, Ron, how do you - -
	CC	We're ready to take it. Go ahead.
	LMP	Ron, how do you read on SIMPLEX Bravo?
	LMP	I do not read you.
	CDR	It's coming at you.
	CDR	Have you got your AUDIO switch ON?
	LMP	Yes.
	LMP	Hey, Ron, I do not read you. Check your VHF switch.
	LMP	Hey, Ron.
	CMP	That helps. ...
	LMP	Give me a call on B. I do not read you. Do you read me? I can't hear you.
	CMP	...
	LMP	Check your VHF circuit breakers.
	CDR	Tell him to check his audio panel up there.
	LMP	Hey, check your audio panel!
	CMP	...
	LMP	Hey, I wonder if he's - are you sure you're on the right set of hoses?
	LMP	It's my fault. Tell - Okay, stand by.
	CMP	...
	LMP	Okay, I got you. I got you.
	CMP	...

	LMP	Stand by. Stay where you are. Okay, how do you read on VHF Bravo? You're loud and clear.
	CMP	Hey, I finally got you.
	LMP	That was my fault, Ron.
	CMP	Okay. You're kind of clipping there just a little bit. I got the last part of your transmission.
	LMP	Okay, it was just warming up. You're loud and clear now.
	CMP	Okay. I read you. It was just - I missed - it was just warming up, but I ... loud and clear.
	CDR	Hey, Houston, I've got a couple I want to pass on to you.
	CC	...
	CDR	Okay, when I first put in the - -
	LMP	Okay, Ron, how do you read now?
	CDR	- - LGC breaker -
	LMP	Oh, excuse me, Gene.
	CDR	No, go ahead. Finish.
04 10 17 37	LMP	I'm sorry.
	CDR	No, go ahead. Finish that. Stand by, Houston.
	LMP	Am I clipping - am I clipping now, Ron?
	CMP	Yes, you are. I didn't hear you at all that time.
	LMP	Am I clipping now?
	CMP	Yes, you're still clipping.
	LMP	Okay, how do you read now?
	CMP	Okay. You're doing fine. I got that.

	LMP	Okay, I guess we're okay. It was the squelch.
	CDR	Where do you want me?
	CMP	...
	CDR	Where do you want me? I haven't heard anybody. Where do you want - -
	LMP	Oh, you go - you can go to T/R. On Bravo.
	CDR	What, Bravo? On Bravo?
	CDR	Ron, how do you hear Gene?
	CMP	Okay - loud and clear, Gene.
	CDR	Okay, very good.
	LMP	How do you read LMP now, Ron?
04 10 18 26	CMP	You're still clipping, Jack. Can you move the mike a little bit closer, or something?
	LMP	Okay, how do you read now?
	CMP	No, I didn't read you at all that time.
	LMP	How do you read now?
	CMP	Not there.
	LMP	Okay, I've got the SQUELCH to full decrease.
	CDR	Okay, let's press on. What about Alfa?
	CMP	Well, you're going to have to yell or something. I tell you, you're still clipping yourself out, Jack.
	CDR	Okay, you - -
	LMP	Okay, let's - -
	CDR	Do you read Gene, Ron?
	CMP	No, I didn't read you that time.

	CDR	Okay, we're going to press on and get these VHF checks go - -
	LMP	I think we're too close.
	CMP	Okay.
04 10 19 05	CDR	Okay, let's get - -
	LMP	Okay, configure for Alfa, Ron.
04 10 19 09	CMP	Okay, switching to Alfa.
	LMP	Okay, Ron, how do you read on Alfa?
	CMP	Don't read you.
	LMP	How do you read on Alfa, Ron?
	CMP	I don't read you.
	LMP	How do you read the LMP on Alfa, Ron?
	CDR	He doesn't read us. You read him?
	LMP	I read him.
	CDR	Yes - -
	CMP	I don't read you guys at all, except through the tunnel.
	LMP	How do you read on Alfa, Ron?
	CMP	Okay, got you loud and clear that time.
	LMP	Okay, try him, Gene.
	CMP	And, Gene, can you verify the capture latches are all engaged?
04 10 20 00	CDR	Okay, how do you read me?
	CMP	I didn't read you at all, Jack.
	CDR	This is Gene. How do you read me on Alfa?
	CMP	Didn't read you.

	CDR	Okay, let's press on. You're getting us intermittent. We can get it.
	CMP	Okay. I got you that time. And check the capture latches.
	LMP	Okay, Houston - -
	CDR	They're good, Ron.
	LMP	- - I'm pretty sure the VHF is all right - -
	CDR	Yes.
	LMP	- - it seems to have something to do with the squelch settings, and it's probably because we're so close.
	CC	We concur. We'd like you to press on and not worry about the VHF any more right now.
04 10 20 35	CDR	Gordo, we are. Here's a couple of quick ones. When I pushed the LGC DSKY breaker in, I did not get a RESTART light. The keyboard came up with 400 in R-2. The LGC light was already on, and it went off as prescribed. When I did a VERB 35, I got all the proper lights except, when the LGC and ISS lights came on, the entire caution and warning dimmed. One more item. In our DAP setting, we are reading in our checklist, for R-1, plus 645; and for R-2, plus 641. The DSKY DAP came up plus 641 and plus 645. It just reversed those numbers. And I'm going to deploy the landing gear.
	CC	Okay.
	CDR	Okay, Jack, MASTER ARM is coming ON.
	LMP	Okay.
	CDR	Your - Are LOGIC POWER breakers IN?
	LMP	My breaker is IN.
	CDR	Okay, I've got one good light.
	LMP	Okay, I'm going to talk - Okay. Go ahead.

04 10 20 51	CDR	Okay, Houston. MASTER ARM is ON, and B light is on.
	CDR	Let me get this fired. Ron, are you ready? Ron, are you ready for a landing gear? Ron, if you read, the LANDING GEAR is coming on my mark.
	CMP	Okay.
	CDR	3, 2, 1 -
04 10 22 11	CDR	MARK.
	LMP	Hey!
	CDR	Hey, Houston. We've got a good one out front.
	CMP	(Laughter)
	CC	Okay.
	LMP	How's your flag?
	CDR	And the flag is gray.
	CC	... good one.
	CDR	Okay, and the flag is gray.
	LMP	Okay, Houston; the PRIMARY EVAP FLOW time, 108 - EVAP FLOW time, 108:16:55. And I'm ready to copy your abort constants and a DOI-2 pad.
	CDR	And I'll give them DATA.
	CC	... copy abort constants.
	LMP	Stand by, Gordy.
	CC	224, 6 ... - Stand by.
	CDR	Ron, when you get the tunnel closed out, I'll need you for an IMU coarse align.
	CMP	Okay, I'm getting the - probe umbilicals installed now.
	CDR	Okay, I'll need your NOUN 20s when you get a chance.

	LMP	Okay, Gordy, you can go ahead; and you have DATA on the UPDATA LINK.
	CC	Okay. We'll have you an up-link in a minute. 224 is 60470, 29364, 60386, 00594, 32772, 54404. Go ahead.
	LMP	Okay; 60470, 29364, 60386, 00594, 32772, 54404.
	CC	Okay, that was a good readback. Ready with DOI-2 when you are.
	LMP	Okay, Gordy, go ahead.
	CC	Okay. That's DOI-2: T_{ig} time is 112:02:40.92; NOUN 81 is a minus 0007.5, DELTA-V_Y, plus - -
	CMP	Okay, Gene. Can you look at the capture latches? I've got it preloaded here, now.
04 10 25 00	CDR	Okay, Ron. They're looking good.
	CC	- - NOUN 42, 0 - -
	CMP	... - -
	CC	- - 15 - -
	CMP	- - but I have it preloaded.
	CDR	Okay, and the button is flush up front here.
	CMP	Okay.
	CC	- - 0067, 00075; burn time - -
	CDR	Did you get the probe locked, Ron?
	CC	- - 22 - -
	CDR	You didn't, babe. Did you?
	CMP	What do you mean, probe locked?
	CC	- - 00 - -
	CDR	Yes, you did. It's locked. Okay.

	CC	- - 74 - -
	CDR	Okay, it's locked.
	CMP	Oh, the probe. Yes.
	CDR	Yes.
	CMP	Yes. Yes, it's locked.
	CDR	Okay.
	CC	- - 0122.7; the AGS DELTA-Vs are NA.
	LMP	Okay, Gordy. 112:02:40.92; minus three zeros 75 - -
	CDR	And Ron, how soon are you going to be able to give me the coarse align?
	CMP	Okay, I can do that now. I'll put the tunnel in - the hatch in a little bit later.
	CDR	Okay. Give me MIN DEAD BAND, ATT HOLD.
	CMP	MIN DEAD BAND, ATT HOLD. Okay. I'll get that right now.
	CDR	Okay, and - -
	CMP	... Let me get my ...
	LMP	- - all zeros, 074; 0122.7; rest of pad NA.
04 10 26 18	CC	Correct, Jack.
	CMP	Okay, Gene, you've got MIN DEAD BAND, ATT HOLD now.
	CDR	Okay, stand by. I've - Let's see - okay. Okay, I need your numbers then. NOUN 20.
	LMP	Okay, Gordy. I'm going to start the lunar bat check, and it'll be silent.
	CDR	Ron, I need your - your NOUN 20 numbers.
	CMP	Plus 356.95, plus 106.34, plus 001.49.

	CDR	Okay. I've got 356.95, 106.34, and 001.49.
	CMP	Right.
	CC	Challenger, we want to get the - attitude - -
	CMP	...
	CC	- - tweaked up closer to the normal before doing the coarse align.
	CDR	Wants to what?
	LMP	Wants to tweak the attitude up closer to normal.
	CDR	Hey, Ron, they want a more normal attitude for you. You're not quite nominal.
04 10 27 48	CMP	Okay, that's to what? Zero, 105, and 0?
	CDR	If you're talking to me, it's about 0, 104.7, and 0.
	CMP	Okay, stand by, Gene. We'll get back to you.
	CC	And your up-link's in there. It's your computer.
	CDR	Okay, Gordy; thank you. And, Ron, let me know when you're tweaked up, and then go MIN DEAD BAND ATT HOLD.
	CMP	Okay.
	CMP	Okay, Houston; America. Zero, 105, and 0. Good?
	CMP	That's interesting. I don't know how it got out of attitude.
	CMP	Maybe - maybe I hit the stick or something, here.
	CMP	Okay, Gene. We're MIN DEAD BAND ATT HOLD, and 0, 105, and 0.
	CDR	Okay. Read out NOUN 20.
	CMP	Okay, VERB 06 NOUN 20; 000.32, 104.40, 359.55.
	CDR	Okay, I got all those.

	CMP	Okay.
	LMP	Okay, Houston. I skipped a step on the LUNAR BAT OFF/RESET. I'll go back.
04 10 29 58	CMP	Okay, Houston, I forgot to release the docking latches. Okay. I'll go up and release docking latches 1 and 7.
	CMP	Well, if I just put the - Well, I'll do that. I was going to say you could read the probe temp if I put the circuit breakers in.
	CC	- - we think you missed a step. We need the - -
	LMP	Yes.
	CC	- - the LUNAR BAT - -
	LMP	That's right. I'll go - -
	CC	- - OFF/RESET.
	LMP	That's affirm. I'll go back. Stand by.
	CC	Okay.
	CMP	Okay, there's number 1. One release, two releases, and three.
	LMP	Okay, I'm back to LUNAR BAT RESET - LMP LUNAR BAT, OFF/RESET.
	CMP	Seven.
	CDR	Okay, Gordy. For the LM, I've got 300.88, 284.40, and three balls 45. How does that sound?
	CC	Stand by. We're checking.
	CDR	Come on, you ought to have that number.
04 10 31 37	CMP	Okay. DOCKING PROBE circuit breakers, two of them, are going CLOSED. MAIN A; MAIN B. PROBE EXTEND/ RELEASE is going to - RETRACT. Ah-ha. I got two barber poles.

	CC	Geno, those angles are okay.
	CDR	Okay; figured they were. They're going in.
04 10 32 01	CMP	Okay. Docking PROBE circuit breakers going OPEN. Okay. EXTEND/RELEASEs - and they went gray, of course, when they went OPEN. Okay. EXTEND/RELEASEs to OFF. Verify probe extend latch engaged ... Well, I'll go back. It wasn't awhile ago, but I'll go look again. Okay, if we hit EXTEND with the circuit breakers - in. Oh. Mighty fine. It's still back inside there. Extend latch is still engaged.
	CDR	Okay, Ron. On my mark, I'd like an 06 20.
	CMP	Okay, standing by. Go ahead.
	CDR	Okay. 3, 2, 1 -
04 10 33 47	CDR	MARK it.
	CMP	Okay. 000.44, 104.63, 359.69.
	CDR	Okay, got those.
	CMP	Okay - -
	CC	Challenger, we've got those angles here on the ground, for both spacecraft.
	CDR	Fine, Gordy.
	LMP	Houston, ED BAT 37.2, 37.2 at 109:14:00.
	CDR	Yes.
	LMP	All battery indications on board were normal, once I got started.
	CC	Okay. They look good to us, also.
	CDR	Why don't you stay in that MIN DEAD BAND, ATT HOLD, and I'm going to do a P52.
04 10 35 23	CMP	Okay, I've got the - the cameras all set. I've got them out anyhow. I don't have the - the right

values on the lenses yet; but, anyhow, the cameras are out and they're loaded. I've got mag 00 - -

LMP Houston - -

CMP - - on the Hasselblad.

LMP - - the LMP. A couple of minor things on the backside checkout. The secondary glycol pump, when I started it, the sound and the pressure was ragged, oscillated around - 20 psi, and then stabilized after about 15 seconds and sounded smooth. It had a sound as if it was cavitating a little bit, but after that, it was smooth. Over.

CMP Say, Houston, why don't we go ahead and get the - -

CC ..., Jack.

CMP - - PGA ver out of the way?

LMP And - -

CMP - - and then we can get some of this - -

LMP - - on step 3 on page 3-15.

CMP - - data, or would you rather get the pad up first?

LMP When I went to SUIT FAN 1, I got a MASTER ALARM, but all other indications were okay, and the MASTER ALARM reset.

CC Okay.

CMP Anyway, I - -

LMP Okay. I'm sorry. I misinterpreted the words there. I should have gotten that. Forget that one.

04 10 36 51 CMP And - Okay, we're SQUELCH A now. I've even got it all the way down to 1, and I still don't hear them.

LMP Okay, Geno. You need some help?

CMP Oh, yes. I got a satisfactory - Every once in a while, I can hear them now; they're cutting in and out somewhere, and I don't know where.

	CDR	Turn some of the lights down.
	CDR	Okay, Jack; that's what the - numbers ought to be. Dubhe's the first star. And those are what the spiral/cursor numbers ought to be, so let me go to cursor first - 170 something.
	CMP	SQUELCH A is setting at about 4.
	CDR	Now, I need the - I need the eyepiece.
	CMP	Okay. You have it.
	LMP	Okay.
	CDR	Now, I've got to go to position 3.
04 10 38 46	LMP	Doing - What star you got, 30? Or, no, what star?
	CDR	Dubhe. Dubhe. Yes, she's going to be right in there.
	LMP	Okay, and those are the numbers.
	LMP	Okay, that's good. Okay. You ready to mark? What do you want first?
	CDR	Cursor. Can you hold that down? I need it to hold - I can't stay up - I can't stay down here.
	LMP	Couple it.
	CDR	Wait. I'll put my foot back here. Okay. You ready?
	LMP	Go ahead. Which one, cursor?
	CDR	Yes, Yes; go.
	CMP	Go ahead.
	CDR	17108
04 10 40 14	LMP	17108.
	CDR	Hey, we've got to turn these overhead lights out, Jack. If we can.

	LMP	Oh -
	CDR	The floods, right up here.
	LMP	Well, let's see.
	CDR	Just turn them down.
	LMP	They are down.
	CDR	Ready to mark?
	LMP	Wait a minute. Go ahead.
	CC	- - take a look at the glycol pump - -
	CDR	Ready?
	CC	- - pressure. Can you close the GLYCOL PUMP SECONDARY circuit breaker?
	CDR	Ready?
	LMP	Let us finish this.
	LMP	Go ahead.
	CDR	Oh, I've lost it now. Stand by.
04 10 40 48	CDR	MARK it. 17108. Yes, that's good ... - -
	LMP	17108.
	CDR	Yes.
	CDR	What's he want?
	LMP	I'll get it - second.
	CDR	What? The SECONDARY?
	LMP	Yes, I'll get it. Go ahead.
	LMP	Gordy, you want the SECONDARY?
	CC	Affirmative. Panel 16, GLYCOL PUMP SECONDARY breaker; third row, in the middle.

	LMP	The ..., Gordy!
	CDR	Am I ready to mark?
	LMP	Go ahead.
	CDR	17120.
	LMP	Go ahead; 17120.
	CDR	17118.
	LMP	17118.
	CDR	Yes.
	LMP	Okay. Are you ready to mark spiral?
04 10 42 04	CDR	Okay.
	CDR	What's all that about?
	LMP	Okay. We've got a GLYCOL light, and the temperature is 50. I think that's in the secondary loop.
	CC	Okay. The pressure looked good there. We'd like that breaker back open. The MASTER ALARM you have is normal.
	LMP	Roger; understand it.
04 10 42 52	CDR	Stand by. Spiral.
	CDR	31377.
	LMP	31377. Go ahead.
	CDR	There's a lot of light coming in somewhere. It's probably earthlight.
	CDR	31303.
	LMP	31303.
	CDR	Now, how many more do I need?
	LMP	You need two more.

	CMP	Say, Houston; America. How much time to AOS yet - to LOS?
	CDR	31245.
	CMP	- - got a little time for the PGA ver - -
	LMP	Okay; 31245.
	CMP	Okay. Ah-ha, I got the old helmet and gloves on.
	CMP	More cables all over the place here than I know what to do with.
	CMP	(Laughter) I got cables and hoses and -
	CDR	31322.
	LMP	Okay, that's it - for - Now, the next star. Okay. We'll PROCEED. Okay, you like those numbers?
	CDR	Yes.
04 10 45 58	LMP	Yes. Okay. All right. VERB 21 ENTER. You want a 111 - 111, Aldebaran. ENTERED. PROCEED.
	CDR	Why don't you write those down?
	LMP	Yes, I will.
	CDR	And I'll do - Obviously, Cursor's first.
	LMP	Okay; 111. You ready to mark - cursor?
	CDR	Yes.
	CMP	Okay.
	CDR	Get the lights if you can.
	CMP	Oh, son-of-a-muck; I hit the stick again. Now I got to unlock it.
	CDR	Ron, keep at min DEAD BAND, ATT HOLD. I've got to finish a P52.
	CMP	Okay. You want me to maneuver back to attitude?

	CDR	No; just stay where you are.
	CMP	We're out of attitude just a little bit.
	CDR	Just stay where you are, and put it in MIN DEAD BAND.
	CMP	Well, I'm MIN DEAD BAND, but I maneuvered out of attitude. You want to go back to regular attitude?
	CDR	No! N-O, no.
	LMP	Alderbaran is your star. Oh! Do you read me?
04 10 47 25	CDR	Yes.
	LMP	I don't read me very well.
	CDR	32961.
	LMP	329 - 61; 32961.
	CMP	- - flow return is to the - -
	LMP	Go ahead.
	CMP	- - suit flow valves. The other two are closed, mine is open, and I've got the interconnect in between the other ones. How's the old suit pressure? Okay; looks like pretty good. Okay; O_2 flow is lower limit. Okay - -
	CDR	32947.
	LMP	Say that again. I - Ron - -
	CDR	3 - I wish he'd go off VOX - 32947. Let me turn this VHF -
	LMP	Okay; 32947.
04 10 48 33	CDR	Okay.
	CMP	And it feels like it's going up.
	LMP	You're clear.

	CMP	And terminal DIRECT O_2. Okay, I have that. O_2 FLOW HIGH.
	LMP	Hey, Ron, this is Challenger. We're going to be off your loop for a while so we can finish the - -
	CDR	I don't like that. I don't like that. I want to reject it.
	CMP	...
	LMP	Okay.
	CMP	...
	CMP	Okay; plus - -
	CDR	I want to reject it.
04 10 49 04	LMP	- - ENTERed, PRO. You can reject it.
	CDR	Okay.
	LMP	Okay.
	CDR	33100.
	LMP	33100.
	CDR	Yes.
	LMP	Go ahead. One more on the cursor.
	CDR	32972. Son of a gun.
	LMP	What's the problem?
	CDR	It's just hard to - -
	LMP	32972.
	CDR	Yes - hard to focus everything in there.
	LMP	Okay; and you're clear on spiral.
	CDR	Okay.

	CDR	Ready to mark?
	LMP	Go ahead.
	LMP	Should be around 37.
	CDR	41 - 04116.
	LMP	Whoops.
	CDR	That's all right.
	LMP	Plus 04116.
	CDR	04116.
	LMP	Go ahead.
	CDR	04147.
	LMP	04147.
	CDR	Two more.
04 10 52 36	CDR	04303.
	LMP	303 - 4303. Okay.
	CDR	Boy, I can sure see him maneuvering.
	LMP	One more.
	CDR	Best I can do - 04407. Whew.
	LMP	Is he moving?
	CDR	Yes, he's moving. Just like he did in the simulator the other day.
	LMP	Well, they're not bad.
	CDR	Well, I'll tell you. That's an eye bust. You're lucky.
	CDR	Hello, Houston. That looked to be a pretty good alignment from what I saw. There's 07 for you.

	CC	Okay. We copy.
	LMP	Here, I'll copy those in here.
	CC	Okay, Challenger. Torque them.
04 10 54 12	LMP	109, 34, 5.
	CDR	Okay.
	LMP	Make that 7.
	CDR	Jack, you go to centerline and zero up there.
	LMP	Okay.
	CDR	And I'll pull the breaker.
	CDR	Hello, America; Challenger. We no longer need your MIN DEAD BAND.
	CMP	...
	CDR	Okay, but I would like a NOUN 20 from you on my mark.
	CMP	Stand by.
	CDR	Okay; 3, 2, 1 -
04 10 55 01	CDR	MARK.
	CMP	092.15, 104.36, 359.69.
	CDR	Okay.
	LMP	You got those?
	CDR	Not yet. Ground will have them.
	LMP	Okay. We're ready for RCS, and we're about 10 minutes behind.
	CC	Okay, Challenger, we've got the NOUN 20s, both spacecraft.
	CMP	And Houston, do we want to release those docking latches - before they do their hot fire? I don't think so. Do we?

	CC	...
	CMP	Yes.
	CDR	Okay. You picking up that first part?
	LMP	Yes.
	LMP	Okay, temperatures are good.
	CDR	Okay.
	LMP	Helium is 30 - 3050.
	CC	- - Houston. We're ready anytime for the - -
	CDR	Let's go.
	CC	- - RCS pressurization. You might turn the HEATER switch OFF.
	LMP	And - I just did.
	CDR	Okay, go ahead.
	LMP	I just got that, and we're going.
	CDR	Okay.
	CDR/LMP	Propellant - -
	LMP	- - pressure, 70 degrees.
	CDR	Go.
	LMP	And it's 15 - no, that's - -
	CDR	Propellant.
	LMP	- - 25 about.
04 10 56 46	CDR	Let's go. Fuel?
	LMP	And - 50.
	CDR	Go.
	LMP	And 50 - no, make that 60 on the oxidizer.

	CDR	Okay. Your quantity?
	LMP	The quantities are 100.
	CDR	Okay, on 16: LOGIC POWER B, OPEN.
04 10 57 01	LMP	B's coming OPEN.
	CDR	Okay.
04 10 57 05	CDR	MASTER ARM is ON. I've got one good light - SYSTEM A.
	CDR	Okay. Why don't you read them to me - -
	LMP	Okay. MASTER ARM, ON; HELIUM PRESS - HELIUM PRESS, FIRE.
	CDR	Well, HELIUM PRESS, RCS.
	LMP	RCS, FIRE; I'm sorry.
	CDR	Okay; HELIUM PRESS - I just don't want to get the wrong one.
	LMP	Yes. Okay?
	CDR	Okay, on my mark. 3, 2, 1 -
04 10 57 24	CDR	MARK it. We heard it.
	LMP	Sounds like they filled up. 175. I mean - 180. Looks good.
	CDR	REG lights are off?
	LMP	Yes.
	CDR	And MASTER ARM is OFF.
	CDR	Recycle all your -
	LMP	Okay. CLOSED - CLOSED - OPEN - OPEN - CLOSED - OPEN - OPEN. They're all okay.
	CDR	And your LOGIC POWER B closed?

	LMP	B is CLOSED.
	CDR	And read the temp/pressures to me.
	LMP	Okay - -
	CC	- - we saw it, and it looks good - -
	LMP	- - 180 - -
	CC	- - ... looks good.
	CDR	Looks good on board, Gordo.
	LMP	Oxidizer and fuel are both 180.
	CDR	Go.
	LMP	Propellant's 180.
	CDR	That's go.
	LMP	And helium is slightly under 3000.
	CDR	That's go.
	CDR	Okay.
	LMP	Checkout. You ready?
	CDR	Okay. Let's go. You read it to me, and we'll press.
	LMP	Okay. GUIDANCE CONTROL, PGNS.
	CDR	PGNS.
	LMP	ATTITUDE/TRANSLATION, 4 JETS.
	CDR	4 JETS.
	LMP	ATT CONTROL, three, in PULSE.
	CDR	PULSE.
04 10 58 37	LMP	MODE CONTROL, both, ATT HOLD.
	CDR	ATT HOLD.

	LMP	Switch guards at 6 o'clock.
	CDR	Six.
	LMP	NO DAP light, off.
	CDR	NO DAP light is off.
	LMP	ACA/4 JET, commander, DISABLE.
	CDR	What do you want?
	LMP	Your 4 - ACA/4 JETs, DISABLED.
	CDR	Okay.
	LMP	TTCA, both, to JETS.
	CDR	Okay.
	LMP	Mine's JETS.
	CDR	Mine's JETS.
	LMP	Verify high bit rate with MSFN and CSM in WIDE DEAD BAND, ATTITUDE HOLD.
04 10 59 03	LMP	Okay, Houston, verify high bit rate; and, Ron, we need you in WIDE DEAD BAND, ATTITUDE HOLD.
	CDR	Why don't you put that here if you - can you read it here? So we can - -
	CMP	Okay. WIDE DEAD BAND, ATT HOLD. That's what I'm on.
	CDR	Okay.
	CDR	Why don't you turn these up?
	CMP	And, Amer - Houston, America; I missed T_2 on.
	CDR	Okay.
	CC	Okay, we verify high bit rate.
04 10 59 30	LMP	Okay, QUAD flags. Okay. VERB 76 ENTER.

	CDR	Go.
	LMP	NO DAP light on. VERB 11 NOUN 10 ENTERed; 05 ENTER - 05 ENTER. CDR TCA.
	CDR	Okay. Here we go, Houston, with the cold-fire check.
	LMP	Okay, you want to go up?
	CDR	Okay.
	CC	All set.
	LMP	And that's good.
	CDR	252. Okay?
	LMP	Okay, down.
	LMP	125 is good. And the rest of the flags.
	CDR	Okay.
	LMP	Okay. I'm going to do it.
	LMP	Up, 252; down, 125. That's good.
	CDR	And nonreturn to zero.
	LMP	Okay. Okay. ENTER; 06 ENTER. Okay? Right - 220. That's good. There's zeros; left, 140 - good. There's zeros; forward, 11 is good. There's zeros; back, 6 - is good. And there's zeros.
04 11 00 43	LMP	Okay, Houston. PGNS rate command cold fire; AGS pulse - cold fire check.
	LMP	ATTITUDE DIRECT CONTROL circuit breaker.
	CMP	- - go to - RECEIVE ONLY on the VHF for a little bit?
	LMP	(Laughter) Sure, Ron.
	CMP	Okay.

	LMP	Okay; ATTITUDE DIRECTON CONTROL, CLOSE.
	CDR	Okay; CLOSED.
	LMP	VERB 77 -
	CDR	What's all that stirring around? Is that the S-band? Yes.
	LMP	It's his attitude, I - or maybe our S-band.
	CDR	It's the S-band.
	LMP	VERB 77, you got? VERB 15 NOUN 01 ENTER. Okay, and 42 ENTER.
	CDR	Okay.
	LMP	CDR ACA to soft stop, pause 2 seconds at null. Roll right. Okay, fi - that's good. Roll left. That's good. Pitch up - 47. That's good. Pitch down. Seven - Wait a minute. You got it? Thirty-one; that's good. R-2. Go ahead and raw - yaw right - 27 is good. Yaw left - 50 is good. Okay.
04 11 02 02	CDR	Better tell them where we are.
	CMP	All right, Houston. Step 4, AGS rate command cold fire, 4-jet secondary coil hot fire check. Hey, Ron, we're going to have some hot fires here.
	CC	Go. We're looking good so far.
	LMP	We're going to have some hot fires here, in a minute.
	CMP	Okay. Wait a min - hold it, America - Challenger. The hot fire - you want FREE, Challenger?
	LMP	That's affirm. Go CMC MODE, FREE.
	CMP	Challenger, America. You want FREE for your hot fire?
	LMP	Tell him. He's not reading me, apparently.
	CDR	That's affirm. We want you FREE, Ron.

	CMP	Okay. I'm going to FREE now.
	CDR	Okay.
04 11 02 43	LMP	Okay; GUIDANCE CONTROL, AGS.
	CDR	AGS.
	CMP	And, Houston; America. You can try that one again.
	LMP	ATT CONTROL, MO - ATT CONTROL, three, to MODE CONTROL.
	CDR	Ron, go RECEIVE ONLY.
	LMP	Okay. ATTITUDE - You got AGS?
	CDR	Yes.
	LMP	ATTITUDE CONTROL, three, to MODE CONTROL.
	CDR	(Coughing)
	LMP	ACA - ACA/4 JET, CDR, ENABLE.
	CDR	ENABLE.
	LMP	CDR ACA; deflect slowly to hardover, pause 2 seconds at null.
	CDR	Okay.
	LMP	Roll right.
	CDR	Ooh.
04 11 03 21	LMP	We got it. Okay? Roll left.
	CDR	Ooh.
	LMP	Okay. Pitch up. Okay, pitch down. Okay, yaw right. Okay, yaw left.
	CDR	Okay.
	LMP	Okay. (Laughter)
	CDR	Houston, hardover looked good from here.

	LMP	Okay.
	CDR	Okay.
	CC	It was good down here.
	LMP	All right, Houston; PGNS minimum impulse hot fire check. GUIDANCE CONTROL, PGNS; VERB 76 ENTER; NO DAP on. Okay. We need to close our breakers. Okay, my four are CLOSED.
04 11 04 11	CDR	And my four are CLOSED.
	LMP	INSTRUMENTATION secondary; CWGA, OPEN and then CLOSE.
	CDR	Uh-oh.
	LMP	Try -
	CDR/LMP	There they go.
	LMP	Okay, Houston. We have a sticky talkback, red, on SYSTEM A, QUAD 4. And it went gray with a tap.
	CDR	Where are you?
	CC	Okay, Jack.
	LMP	VERB 11 NOUN 10 31 ENTER. R-1 is 67777. CDR ACA, out of detent, 2-1/2 degrees; pause 2 seconds at null.
	CDR	The pulse?
	LMP	Okay, 57 is good. Roll left - 37 is good. Yaw right twice; slowly.
	CDR	Tell me to do it again.
	LMP	Okay, that's 67 - Now, do it again. Okay, that's good. Now, yaw left twice - 73, that's good. Okay, that's good.
04 11 05 21	CDR	Two different thrusters are firing.
	LMP	Yes. VERB 48 ENTER. VERB 21 ENTER.
	CDR	Okay.

	LMP	31022. PROCEED. And a VERB 34. VERB 11 NOUN 10 ENTER - 31 ENTER. Okay. CDR ACA, out of detent, 2-1/2 degrees; pause 2 seconds at null. Pitch up - 76 is good. Pitch down - 75 is good.
	CDR	He won't hear you.
	LMP	Okay. Okay, go ahead.
04 11 06 06	CDR	Ron, the hot fire checks are complete. You can go into WIDE DEAD BAND, ATT HOLD.
	CMP	Okay, Challenger; America. We're in ATT HOLD. You didn't get very far off that time either. That's good.
	CDR	Yes, I think we got them all.
	CC	- - all look good here.
	CMP	Okay.
	CDR	Okay, Gordo. Understand.
	LMP	Well, you verified all this, didn't you, Gene?
	CDR	Yes.
	LMP	Electrical umbilicals.
	CDR	I got elec - he didn't - he didn't - he confirmed that, I confirmed the capture latches.
	LMP	Okay.
	CDR	He called them out.
	LMP	Okay, I'll check that.
	CDR	You can check that stuff when you go and close the hatch.
	LMP	Yes.
	CDR	Okay. We're on the top of 3-28, Gordo. Hey, Ron!
	CC	We're with you.

	LMP	Okay, umbilicals - looks like they're off.
	CMP	Okay, Challenger; America.
	LMP	Yes.
	CDR	Go ahead, Ron.
04 11 07 19	CMP	Okay. I'm going to turn off B-3 and also my roll jets, and then I'm going to undo the docking latches.
	CDR	Okay. You want to verify your TRANSPONDER is OFF as well as B-3?
	CMP	Yes, sir. Verify TRANSPONDER is OFF.
	CDR	Okay, and you did get the umbilicals, right?
	CMP	Say again about umbilicals.
	CDR	You did get the LM to CM umbilicals? Right?
	CMP	All I get is umbilicals. I didn't get the question.
	CDR	Did you disconnect the LM to CM umbilicals? Verify.
	CMP	Verify. I have those down here.
	CDR	Okay, very good.
	LMP	Okay - -
	CMP	Jet Bravo 3 is OFF.
	LMP	- - Geno.
	CDR	Yes.
	LMP	It's locked - to the yellow, and it's full out.
	CDR	And it won't turn.
	LMP	And I felt it pop. It won't turn.
	CDR	Okay, what about the -
	LMP	And it's tight.

04 11 08 17	CDR	Okay. And overhead, AUTO and locked?
	CC	Challenger, Houston. We cannot completely explain the startup indications you had on the PGNS, but there's no great concern. You're looking good so far. The DAP gimbal trims are no problem; don't bother changing them. And there will be no PIPA bias update, yet anyway. Over.
	CDR	Okay. Understand. Was the checklist written backwards on that?
	CC	A Cape problem on their tape, and they had it reversed - -
	CMP	Okay, ..., we'll try to get that UHF test.
	CDR	Okay.
04 11 09 00	CMP	Roger. GO for undocking.
	LMP	Okay, we need to get our LEVA bags. Let me get down here first, Geno.
	CMP	Okay, number 1 is disconnected. And, Houston, can you watch my O_2 flow - while I disconnect these things. Okay.
	CC	Challenger, Houston. You have a GO for undocking and sep.
	CDR	Roger; understand. And GO for undocking and sep.
	CMP	- - out of the way. Number 1 ... is out of the way. Okay, that's three of them on number 3, and it's out of the way. Number 4 was already cut, and it's out of the way. Okay, number 5. One, two - it's still in release, there it goes off the docking ring. Okay, number 6, there's one, two, and it's still in release and the hook is off of the docking ring. Okay, 7 is released and the hook is off the docking ring. O_2 flow still okay?
04 11 11 04	CMP	Okay, here's number 8 - one, two, and she's fully released - the hook is off the docking ring.
	CC	Okay.

	LMP	Can you give me your LE - LEVA bag when you get a chance?
	CMP	- - one, two, and she's fully released, the hook clears the docking ring. Okay, number 10. There's one - -
	CDR	Geez, Jack, I don't know if I can.
	CMP	- - released and hook clears the docking ring. There's one - hook. Okay, handle's free, J hook ... is off the ring - -
	CDR	We are.
	CMP	- - only one more to go. ... switch. There's two latches, sounded like it came over. And that stays clear, handle's free. By golly, they're all off. Hey, Challenger; America. You're hanging on those two little bitty things.
	CDR	Okay, fine, Ron.
04 11 12 29	CMP	Okay. I'll put the old - -
	CC	Okay, Houston. You're 1 minute to LOS and we'll see you when you get around to the other side, independently.
	CDR	Okay, Gordo, I understand. I'm in step 4, RENDEZVOUS RADAR mode is to AUTO.
	CDR	The radar has come out and I'm in RADAR TEST now.
	CMP	Okay, I'll get that VHF stuff. Let's put the hatch in.
	CC	... just a friendly reminder to do the LOS procedure on the steerable.
	LMP	Yes. What do I - where are those? Okay. Where's my book? Lost my bag - supposed to take that one.
	CMP	... RECEIVE ONLY to B DATA.
	LMP	- - 3-29.

	CMP	Hey, Challenger; America. I'm going to RECEIVE ONLY, B DATA. Hey, Challenger; America - -
	CDR	Okay, Ron; stand by, please.
	CMP	Challenger, America.
	LMP	Hello, Ron. How do you read?
	CMP	B is OFF, A is SIMPLEX. ... is good.
04 11 14 08	LMP	How do you read, Ron?
	CMP	Tape motion, ... RECORD/FORWARD/COMMAND RESET. ... RECORD/FORWARD/COMMAND RESET. SIMPLEX. Okay, Challenger; America. I don't read you, but I'm going to put the hatch in.
	LMP	Hey, Ron, how do you read? How do you read, Ron?
	CMP	Okay, I got you that time, Jack.
	LMP	I think your VOX is cutting us out. When you talk to yourself, I think you cut us out.
	CMP	You read me okay?
	CDR	That VOX?
	LMP	Yes, you're loud and clear, but turn off your VOX.
	CMP	Okay, I'm fanning too much, huh?
	LMP	Affirmed.
	CMP	(Chuckle) I can't read you right now. That doesn't ... too much.
	LMP	Turn off your VOX!
04 11 15 12	CMP	Okay! Just a minute!
	LMP	Just like in the simulator.
	CMP	- - say.
	LMP	Just like in the simulator. Yes, I think that's pretty good.

04 11 15 30	CMP	Okay, hatch is going in.
	LMP	Excuse me, Gene.
	LMP	What can I do to help you?
	CDR	Aaah - could read some numbers. And see how - why don't you set that clock to docking - to undocking - that would help.
	LMP	Okay.
	CMP	Hey, Challenger - -
	LMP	That came from somewhere.
	CMP	- - America. You verify your hatch valves in AUTO?
	LMP	Ooooh. That's verified, Ron.
	CMP	Okay, I'm going to vent the tunnel.
	CDR	Man, it's hot. We don't have any LCG water, do we?
	LMP	Sure. Should have.
	CDR	Sure like a squirt of it. Boy, my eye's watered so much, I can't believe it.
	LMP	Okay.
	CDR	Got to watch that one right there.
	LMP	Yes, I'm watching. You mean the cabin?
	CDR	No, the talkback.
	LMP	Oh, yes.
	CDR	Oh, that feels better. Oooh.
	LMP	Okay. 110:30. We didn't get an undock time update but - Hey, Ron, what are you using for undocking time now?
	CMP	I'm looking - about 1 - Wait a minute.

	CDR	Pull that when you get a chance. That's just what the doctor ordered.
04 11 19 05	CMP	110:27.
	LMP	Yes, 110:27. Okay, come up on 27 minutes.
	CDR	Radar is all looking good.
	CDR	We get a chance, if there's any eye drops in there. I won't be able to put them in in here - well, I might - I'd like to put something in my right eye.
	LMP	What did you get - a particle in there or -
	CDR	No, I don't know. It's just been watering.
	LMP	Let's see, I don't know what I have to do here. We've got to do a pressure - pressure integrity check.
	CDR	Just like the simulator. Only better.
	LMP	Okay, I'm going to get it set up for an integrity check, Gene.
04 11 20 28	CDR	Hello, Ron. I don't - you can use B-3 if you need it.
	CMP	Okay, I'll turn it back on here, then. Takes a lot longer to - depress the tunnel - to vent the tunnel - than it does in the simulator.
	CDR	Yes. Okay, we don helmet and gloves here. Are you through.
	LMP	Yes.
	CDR	Okay, let's do it.
	CDR	Make sure the cap's off your relief valve.
	LMP	Yes. Mine is off.
	CMP	Are you through with your rendezvous transponder test?
	CDR	Sure am, Ron.

	CMP	Okay, I want to - -
	LMP	We're a little bit behind.
04 11 21 28	LMP	Somehow, we got a way with our helmet bags. Which is probably just as well.
	CDR	Be careful what you put on the comm panel because we've got a hot RCS now.
	LMP	Yes.
	CDR	Yes, if there's someplace where we can legitimately put these -
	LMP	I'll find a storage spot for them. If you can hang on to them for a minute.
	CDR	Well, I could put them in one of these bags right here.
	LMP	Yes, well - but I'll find a place to put them, too.
	CDR	Let me just zip - just - Want some help?
	CDR	Okay.
	LMP	How do you read?
	CDR	Good.
04 11 22 46	LMP	Okay, you're a little low. I'll turn you up.
	CDR	Okay, you want to do the same for me here.
	LMP	Okay.
	CDR	Get it in back, and I'll get it in front.
	LMP	Watch your water.
	CDR	Okay. That water is really way in the wrong place. It's got to be changed.
	LMP	You ready?

	CDR	Man, that water's way in the wrong place. Okay, yes. Feels good. See, Jack, Ron put that on the snap. It's got to be over here. That was my fault. Okay. Gloves, huh?
04 11 23 21	LMP	Boy, you certainly aren't very loud.
	CDR	I'm not.
	LMP	How am I?
	CDR	You're all right. You got the volume up?
	LMP	Yes.
	CDR	All right - I got my mike.
	LMP	Try me again. Wait a minute . Oh, you're right. Give me a count.
04 11 23 48	CDR	1, 2, 3, 4, 5.
	LMP	Okay. I've got MASTER VOLUME and INTERCOM full up. I think it'll be all right. Gene, you've got an empty pouch over there for this stuff, I think - We can put it on.
	CDR	Okay. Stick it behind something now and when we - stick it up behind that rail up on top.
	CDR	Okay. I'm in my helmet and gloves.
	LMP	Okay. Well, I'll be with you shortly.
04 11 25 04	CDR	I'll do that rate gyro test while you're doing that.
	LMP	Good.
	CDR	Is it going down?
	CDR	Okay. You want to put these in the purse.
	CDR	Guess it's all right for lunar surface but isn't much for orbit.
	LMP	They going to stay in there? I can put them back in the pocket.

	CDR	No, they'll stay there.
	LMP	Rate gyros okay?
	CDR	Yes.
	CDR	We got the integrity check and prep for undocking.
	LMP	Okay. Be right with you. Did you get your silicon on your hands?
	CDR	I don't need it with my IV gloves.
	LMP	Oh, okay.
	CDR	Okay. And then I'll read them to you whenever you get that in.
04 11 27 55	LMP	Okay, Geno, I'm verified lock. How about yourself?
04 11 27 56	CDR	Okay. And I'm locked.
	LMP	Okay. Go ahead.
	CDR	Okay. SUIT GAS DIVERTER, PULL-EGRESS.
04 11 28 00	LMP	PULL-EGRESS.
	CDR	CABIN GAS RETURN, EGRESS.
04 11 28 03	LMP	EGRESS.
	CDR	SUIT CIRCUIT RELIEF, CLOSED.
04 11 28 07	LMP	Okay. RELIEF is going CLOSED.
	CDR	Okay. PRESSURE REG A, EGRESS, and B, DIRECT O_2. And monitor cuff gage until we get 3.7 or 4.0.
04 11 28 15	LMP	A is EGRESS, and B, DIRECT O_2.
	CDR	That's affirm. Okay. I'm going up.
	CDR	And the suit loop's going up over there, too.
	LMP	Why don't you turn the window heaters on? Can you do that?

	CDR	Yes.
	LMP	My window's still fogged up. John said we'd have to do that. Well, let's don't forget it.
	CDR	Remind me to turn them off.
	LMP	Roger. Want a little water?
	CDR	Yes, I sure would. Boy, it's coming up slow, isn't it?
	LMP	Just like the simulator.
04 11 29 21	CDR	I'm off the peg.
	LMP	So am I.
	LMP	Okay. Where do - Is it time?
	CDR	Yes.
04 11 29 48	CDR	MARK it; that's good.
	LMP	Okay, I'm in E - -
	CDR	Okay. Go to EGRESS. Okay. Let's monitor decay for 1 minute.
	LMP	Okay. I'm about 3.7 - -
	CDR	I'm 3.75.
04 11 29 59	CDR	MARK it.
	LMP	Okay.
	CDR	Okay. It should be less than 0.3 in 1 minute.
	CDR	I'm already down to 3.6. What are you?
	LMP	Yes, I am too. I'm - That's 30 seconds. How's the cabin? I mean how is the suit loop?
	CDR	Suit loop's fine. It's - That was more than 30 seconds. That was a minute and - -
	LMP	Man, I just barely passed.

	CDR	Okay. Let's go. CO_2 SECONDARY SELECT CANISTER, SECONDARY.
	LMP	Okay. You want me to pump it up again?
	CDR	Yes, why don't you pump it up again to 3.7.
	LMP	Okay. I'm supposed to go to EGRESS, right?
	CDR	You go PRESSURE REG B to EGRESS, yes.
	LMP	Okay -
04 11 31 12	LMP	MARK it. What do you got?
	CDR	Okay. I've got 3.7.
	LMP	No, let me give a little more.
	CDR	Okay. Okay. There's 3.8.
	LMP	Okay.
	CDR	Okay. Okay. Go to SECONDARY.
	LMP	I'm 3.8.
	CDR	Okay. EGRESS?
	LMP	Going - Yes, it's EGRESS.
	CDR	Okay. SECONDARY on the canister.
04 11 31 34	LMP	It's SECONDARY.
	CDR	Man, I still got a clump of air. Now let's monitor - -
	LMP	I'm about 3.55.
	CDR	Yes, that's where I was when you went to secondary. It was about 15:10.
	LMP	Well, they don't seem very tight, do they?
	CDR	That's the entire suit loop.
	LMP	Ye

	CDR	Okay; coming up on 50 seconds. No, that's going back down - that's 30 seconds.
	LMP	Looks like we've got about 0.3 in both loops.
	CDR	Yes. Okay. That's good, Jack. Go PRIMARY on the canister.
	LMP	Okay.
	CDR	SUIT CIRCUIT RELIEF to AUTO. PRIMARY on the canister. SUIT CIRCUIT RELIEF to AUTO.
04 11 32 37	LMP	Going to AUTO.
	CDR	PRESSURE REGS A and B to CABIN.
04 11 32 41	LMP	Okay. Going to CABIN, A, B.
	CDR	And CABIN GAS RETURN to AUTO.
04 11 32 47	LMP	Okay. CABIN GAS RETURN is AUTO.
	CDR	SUIT GAS DIVERTER, PUSH to CABIN.
	LMP	PUSH-CABIN. Oh man! Sorry.
	CDR	Okay. Regulator check. Let's press on with this.
	LMP	Go ahead.
	CDR	Verify TUNNEL HATCH, PRESSURE EQUALIZATION; and TUNNEL VENT valve, CLOSED. They are. Ron, is the tunnel vented yet?
	CMP	...
	CDR	Well, is that vented? Yes, we're going to press on. That's a big enough DELTA-P. Oh, CABIN REPRESS valve to MAN - -
	CMP	... press on now.
	CDR	Okay. So are we. CABIN REPRESS valve, MANUAL. Verify FLOW then AUTO.
04 11 33 29	LMP	Okay. It's going to MANUAL. Watch the - -

	CDR	Okay. Go ahead. MANUAL.
	CMP	... circuit return.
	CDR	And then AUTO.
	LMP	I got FLOW.
	CDR	Okay; and then AUTO.
04 11 33 43	LMP	AUTO.
	CDR	Okay. Verify OVERHEAD CABIN DUMP VALVE, AUTO.
04 11 33 47	LMP	It's AUTO.
	CDR	Okay. 16 ECS CABIN REPRESS, OPEN.
04 11 33 54	LMP	Okay. REPRESS coming OPEN.
	CDR	PRESSURE REGS A and B to EGRESS?
04 11 33 58	LMP	A and B are EGRESS.
	CDR	SUIT GAS DIVERTER, EGRESS?
04 11 34 02	LMP	It extended. It's there.
	CDR	Okay. CABIN GAS RETURN, EGRESS.
04 11 34 08	LMP	GAS RETURN is EGRESS.
	CDR	Can you turn around and get the forward dump valve?
	LMP	I can get the upper one.
	CDR	No, don't bend into the tunnel - the forward.
	LMP	(Laughter) You're right.
04 11 34 19	CDR	FORWARD, OPEN and in AUTO at 4.5. I'll give you a call.
	LMP	Okay. It's going to - safety's off. Okay.
	CDR	Suit's going up a little bit. There's 4.5. Okay. We're at 4.5 and CLOSED. And then PRESSURE REGS - -

	CMP	... again, too.
	CDR	Okay, Ron. PRESSURE REG A to CABIN. Verify it rises.
04 11 34 47	LMP	Okay. A is going to CABIN. I got a rise.
	CDR	See it going?
	LMP	Yes, suit loop, That's where it should.
	CDR	Wait a minute. Wait a minute.
	LMP	- - It's 4.9.
	CDR	Wait a minute. Wait a minute. CABIN - SUIT CIRCUIT RELIEF, OPEN. We should have done that; I'm sorry.
	LMP	Okay. I'll go back to EGRESS.
	CDR	Okay. Go to EGRESS. SUIT CIRCUIT RELIEF, OPEN.
	LMP	Okay.
	CDR	Verify suit pressure goes down to 4.5.
04 11 35 23	LMP	OPEN and - Well, it went down, but it's about 4.7.
	CDR	Yes, that's because the cabin's up there now.
	LMP	Okay. That's good.
	CDR	PRESSURE REG A to CABIN, and verify the suit - -
	LMP	You want me to close the - -
	CDR	No, ver - leave the - SUIT CIRCUIT RELIEF, OPEN; verify and then close it.
	LMP	Okay. Thought so. All right.
	CDR	Okay. PRESSURE REG A to CABIN.
04 11 35 43	LMP	CABIN.
	CDR	Verify suit pressure rises 4.6 to 5.0.

	LMP	It did.
	CDR	Okay. PRESSURE REG A to EGRESS.
04 11 35 51	LMP	EGRESS.
	CDR	SUIT CIRCUIT RELIEF, OPEN.
04 11 35 53	LMP	OPEN.
	CDR	Then CLOSE.
	LMP	Let it bleed down. Okay. It's closed.
	CDR	Okay. PRESSURE REG B to CABIN.
04 11 36 07	LMP	B's going to CABIN.
	CDR	Did she build back up?
	LMP	It's going up.
	CDR	Okay. And I can feel the flow, too.
	LMP	Stand by. Stop! You fink! Okay. It stopped at 5.
	CDR	Okay. SUIT CIRCUIT RELIEF, AUTO?
	LMP	You want me to go back to EGRESS on B? B is - B is CABIN, now.
	CDR	Okay. Stay CABIN.
	LMP	All right.
	CDR	SUIT CIRCUIT RELIEF - AUTO.
04 11 36 34	LMP	RELIEF is AUTO.
	CDR	CABIN GAS RETURN, AUTO.
04 11 36 37	LMP	That's AUTO.
	CDR	PRESSURE REG A, CABIN; that should be both of them now.
	LMP	Okay. They're both there.

	CDR	SUIT GAS DIVERTER, PUSH-CABIN.
04 11 36 44	LMP	PUSHED to CABIN.
	CDR	Okay. Cabin pressure will rise 4.6 to 5.0 in approximately 5 minutes.
	LMP	Okay.
	CDR	And on 16, ECS CABIN REPRESS breaker, CLOSED.
	LMP	Okay. REPRESS is CLOSED.
	CDR	Okay. The rate gyro check is done. That checked both regulators. I can feel the flow and see it. Yes. This darned thing won't - Okay. The rate gyro test is done. We got some prep for undocking. You ready?
	LMP	Go ahead.
	CDR	On your side. S-BAND, PM.
04 11 37 22	LMP	PM.
	CDR	SECONDARY.
04 11 37 23	LMP	SECONDARY.
	CDR	PRIMARY.
04 11 37 25	LMP	PRIMARY.
	CDR	VOICE.
04 11 37 26	LMP	VOICE.
	CDR	PCM.
04 11 37 27	LMP	PCM.
	CDR	RANGE.
04 11 37 29	LMP	RANGE.
	CDR	VHF, VOICE.

04 11 37 32	LMP	Okay. It's VOICE.
	CDR	ON.
04 11 37 33	LMP	ON.
	CDR	DATA, ON.
04 11 37 36	LMP	DATA.
	CDR	And ON.
04 11 37 36	LMP	And ON.
	CDR	OFF and LOW.
04 11 37 42	LMP	Okay. OFF - OFF and LOW.
	CDR	That's VOICE, ON; DATA, ON, OFF, LOW. (Cough) You got that?
	LMP	Yes.
	CDR	You don't sound happy.
	LMP	Well, I was happy until you said it again. Okay. I've got VOICE, ON; DATA, ON, OFF, and LOW.
	CDR	That's right.
	LMP	Okay.
	CDR	Okay. Audio both VHF A T/R and B, RECEIVE.
04 11 38 06	LMP	Okay. A T/R and B, RECEIVE. You get yours?
	CDR	You said about 10 minutes, didn't you, Ron.
	CMP	Yes, that's right.
	CDR	Okay. MISSION TIMER; let me doublecheck.
	LMP	Well, he gave me the time I set the clock on.
	CDR	I was just checking our MISSION TIMER. Okay. We got timer set, counting down. Overhead latch locked.

	LMP	Happy?
	CDR	Overhead CABIN RELIEF and DUMP, AUTO.
04 11 38 31	LMP	Okay. That's AUTO and LOCKED.
	CDR	Okay. And PRESSURE REGs A and B to CABIN.
	LMP	Got a place for that?
	CDR	Not right now.
	LMP	Yes, you didn't get it (laughter).
	CDR	Yes, I did.
	LMP	No, I still have it (laughter). I got two pieces of it then.
	CDR	Oh!
	LMP	Okay.
	CDR	That one's AUTO and LOCKED?
04 11 38 57	LMP	AUTO and LOCKED.
	CDR	Okay. PRESSURE REGs A and B to CABIN?
04 11 39 00	LMP	A and B are CABIN.
	CDR	RATE ERR MONITOR, COMMAND - Okay, why don't you - why don't you pick it up right here. Right there.
	LMP	RATE/ERR MONITOR, commander, LANDING RADAR/COMPUTER.
04 11 39 10	CDR	Go.
	LMP	ATTITUDE MONITOR, PGNS.
04 11 39 12	CDR	Go.
	LMP	GUIDANCE CONTROL, PGNS.
04 11 39 14	CDR	Go.
	LMP	MODE SELECT - LANDING RADAR.

04 11 39 15	CDR	Go.
	LMP	RANGE/ALTITUDE MONITOR, RANGE/RANGE RATE.
04 11 39 18	CDR	Go.
	LMP	RATE SCALE, 5 degrees.
04 11 39 20	CDR	Go.
	LMP	ATT/TRANSLATION, 4 JETS.
04 11 39 22	CDR	Go.
	LMP	BALANCE COUPLE, ON.
04 11 39 23	CDR	Go.
	LMP	RATE/ERR MONITOR, LMP, - LANDING RADAR/COMPUTER.
04 11 39 25	CDR	Go.
	LMP	Okay. Point - ATTITUDE MONITOR, LMP PGNS.
04 11 39 30	CDR	Go.
	LMP	RADAR mode, SLEW.
04 11 39 33	CDR	Go.
	LMP	DEAD BAND, MIN.
04 11 39 34	CDR	Go.
	LMP	ATT CONTROL, three, to MODE CONTROL.
04 11 39 36	CDR	Go.
	LMP	MODE CONTROL, both, ATT HOLD.
04 11 39 39	CDR	Go.
	LMP	TTCA, both to JETs.
04 11 39 41	CDR	Go.
	LMP	Mount camera. I need to get the camera out.

	CDR	Okay. Let's do that last.
	LMP	Okay.
	CDR	Press on now.
	LMP	Mount the timeline book. We got that. Configure circuit breaker panels.
	CDR	Okay. I'll take my book.
	LMP	Okay. You've got your book.
	CDR	How's your window?
	LMP	It's clear.
	CDR	Okay. I'm going to pull these breakers.
	LMP	How's your cooling? You want it off or on?
	CDR	Oh, it feels pretty good.
	LMP	Okay. Me, too. Okay. SEQUENCE CAMERA going, CLOSED. Got a light. Okay. I'll mount the camera. My breakers are GO. I'm about ready to put on the restraints. I don't know about you.
04 11 41 23	CDR	Okay. Let's see, closed. Okay. My breakers are all okay, Jack.
	LMP	Mine are good. This is the - this is the end, not the beginning. Only the end of the activation checklist, the beginning of the Timeline Book. You want me to take your Activation Checklist?
	CDR	Yes, sir.
	LMP	I need it for that camera stuff.
	CDR	Okay.
	CMP	Okay. That's flight trim, P41.
	CDR	Okay, Ron, we're at 5 minutes now and counting. How does that sound?

	CMP	Yes, I've got 6.
	CDR	Well, we better go on your time. Better check your undocking time. If you're using 110:27, it's 5.
	CMP	... 55.
	CDR	Oh; 127:55? Give me - -
	CMP	127:55.00.
	CDR	Oh, you give me a hack at 5 minutes, then, will you?
	CMP	Okay. Stick it in there. ...
	CMP	5, 4, 3, 2, 1 -
04 11 42 58	CMP	MARK it.
	CDR	We're ... with you, and your attitude looks good here.
	CMP	Okay.
	LMP	Wish I had a tissue.
	CDR	Ron, when you get all squared away, we need another NOUN 20.
	CMP	... 620.
	CDR	Yes, sir, on my mark.
	CMP	Okay. Go ahead.
	CDR	3, 2, 1 -
04 11 44 33	CDR	MARK it.
	CMP	Okay. - -
	CDR	Can you - -
	CMP	- - 0, 0, 0 - -
	CDR	Wait a minute. Wait a minute. We can't copy them that fast. Wait a minute.

	CMP	... 60, 000.52.
	CDR	Wait a minute, Ron. We've got to copy them. You didn't give us a chance.
	CMP	Say again?
	CDR	We've got to copy them! Slower!
	CMP	Okay. R-1, 000.35; R2, 104.7; R-3, 000.52. How's that?
	CDR	We got them.
	CDR	310 - 301, Jack. 301, 301.09. Okay. 284.5 ... and 359.48. Okay. And that was at 110:29:00.
	LMP	Okay. I got it.
	CDR	Okay, Ron, that puts us inside 2 minutes, and we're ready.
	CMP	Okay. We're all set over here.
	LMP	Would you believe I tried to blow the window off (chuckle).
	CDR	I'd get you a tissue, but it's too hard to get at right now. I think. Yes, we're 2 minutes away.
	LMP	I got the big ones off.
	CDR	They're down here, if I can - well, it would take to much to get in that box.
	LMP	Don't worry about it.
04 11 46 51	CDR	My COAS even works.
	LMP	Okay, Ron. Remember, as soon as it's convenient, you'll start your maneuver to sep attitude, and I'll try to get a good picture.
	CDR	We got the Hasselblad handy?
	CMP	... normal and ... back.

	CDR	I forgot to look up at you. It better work! Get some pictures of us.
	CMP	Son of a gun! Sorry about that. Okay. ...
	CDR	Check.
	CMP	Antenna's hanging on the probe. Okay. You should be hanging on the probe - You are.
	LMP	We are.
04 11 47 47	CMP	Okay. Zero, zero - at zero, zero, we're back off.
	CDR	Sure we could get some pics.
	CMP	...
	LMP	Check your magazine, when you get a chance.
	CMP	Okay. Here we go.
04 11 48 09	CDR	We're backing off. We're free.
	CDR	Oh, is he beautiful! Okay. You want about 1/250 at f/11 - or 8. What's your focus?
	LMP	About 50 feet.
	CDR	Okay. Get ready to - -
	LMP	Okay. I'm going to go.
	CDR	Hey, guess what?
	LMP	What?
	CDR	Did you have 47 in there?
	LMP	Yes.
	CDR	I did that. I took it out.
	LMP	Okay.
	CDR	Okay. I want a YAW left, 60.

	LMP	I think we know when they fire.
	CDR	Okay. You've got your VERB 60 in there, too?
	LMP	Yes.
	CDR	Okay. You look beautiful, Ron. You can - if you - -
04 11 49 36	CMP	Yes, so do you!
	LMP	You need to yaw left just a little more than - Well, you can do that when you get up there.
	CDR	Oooh, boy, give me a VERB 76.
04 11 50 01	LMP	You got it.
	CDR	Okay. Are you beautiful!
	LMP	What's wrong with my camera now?
	CDR	Well, I don't know but -
	LMP	Come on, you stupid thing!
	CDR	I can see it occasionally working, Jack. It's the mag. I see it blinking.
	CMP	You're pretty out there, you know that?
	CDR	Try and get some 70-millimeters, Ron.
	CMP	Okay. That's what I got.
	LMP	Okay. It's going.
	CMP	I've also got some 16-millimeter action.
	CDR	Great. We got all our landing gear?
	CMP	Okay. I'm maneuvering now.
	CDR	Ron, have we got all four landing gears? Go to VHF ANTENNA, FORWARD.
	LMP	It's FORWARD.

	CDR	Ron, have we got all four landing gears?
	CMP	You look great.
	LMP	Okay. I've got him.
	CMP	... flow water, but I guess it's supposed to be that way, huh?
	CDR	That's right.
	CMP	... beautiful. Now, the Sun's shining right through the window. That's the last picture I'm going to get of you.
	CDR	Is that too far down?
04 11 52 00	LMP	A little bit. I'm getting him, though. Tell him I've got a good shot of him.
	CDR	Your SIM bay door jet looks clean.
	CMP	Very good. Okay. I lost - you're right in the Sun for me. You should be getting some good pictures of me.
	CDR	We're working at it, partner.
	CMP	Thank you.
	CDR	Okay. Sequence cam - helmet and gloves off, SUIT GAS DIVERTER, EGRESS. How's our cabin. Look pretty good to you?
	LMP	Yes, sir, it looks great.
	CDR	Isn't that something. America, you look beautiful.
	CMP	... All I had to do was plug in the camera, and that made it work.
	CDR	Okay, Jack, I'm going to go through these steps and take my helmet and gloves off.
	LMP	Okay. I'll get him over this crater and then -
04 11 53 59	CMP	Hey, there you are! Out the hatch window.

	LMP	Tell him to wave to us. (Laughter) Oh, that's a neat shot right now.
	CDR	Boy, that is. Did you get that one?
	LMP	Yes.
	CDR	Yes, I'm get ... around. Look at that SIM bay. Hey, we can see you out the window.
	CDR	Boy, that is some shot.
	LMP	I think I - I've used 50 percent. I better stop. Okay, Ron, you're off candid camera.
	CMP	Okay.
	LMP	Well, I don't know - I'm going to turn - -
	CMP	Okay ... good show.
	LMP	I'm going to get that engine bell.
	CMP	... make your darned landing, now. Okay?
	CDR	Oh, I forgot to say goodby to you, until we see you in a couple of days.
	CMP	Okay.
	CDR	Don't forget, no TEI updates.
	CMP	(Laughter) Don't worry. Never happen.
	CDR	We're coming to look right up your bell.
	LMP	I turned it back on, Gene (laughter).
04 11 55 30	CDR	Yes, I'm still getting him, too.
	CMP	Remember. Falcon 179.
	LMP	109.
	CDR	109, Ron, that's what you are, babe, 109; Falcon 109.
	CMP	... fire ...

CDR Man! What a beautiful engine bell! I just forgot. We're up here swinging all by ourselves.

CMP (Laughter) Yes.

LMP We better do something; like get ready.

CDR Yes, we're - we're in good shape. Landing radar checkout's next.

LMP Is that all?

04 11 56 12 CDR We'll pick it up right here. Only got - Oh, yes. Well, we're a little behind, I think.

LMP Why don't we go ahead. I can leave that darn thing running. We've got an extra mag.

CDR Boy, that's beautiful.

LMP I'm going to go back to f/11.

CDR Went another screw. More screws coming out now. Oh, right up his tailpipe. Got a place we can set this. Isn't there a piece of Velcro here, somewhere like that?

LMP I can put it over here in a minute.

CDR It's on Velcro. Okay, Jack, SUIT GAS DIVERTER, EGRESS.

LMP Okay.

CDR And CABIN GAS RETURN, EGRESS.

LMP Okay. DIVERTER is EGRESS. RETURN's EGRESS. I don't see any Velcro for my helmet, but - -

CDR Okay. The big thing is the landing radar. This is where we - Of course this won't tell us much, but - Ron, you sure are pretty.

CMP Well, ... old LM challenger looks good there, too.

CDR Okay. The main thing was we had four legs, huh?

CMP Can you see the SIM bay at all?

04 11 57 46	CDR	Yes. We saw the SIM bay - almost oblique - but saw the whole thing. We're looking right down your tailpipe at the surface.
	LMP	Okay. Landing radar check - -
	CDR	Okay, Jack, LANDING RADAR breaker is IN, and I've got altitude and velocity transmitter. That's good start. Eighty degrees. That's okay. CROSS POINTER's HIGH MULT. You reading me all right?
	LMP	Yes, I'm just getting organized here.
	CDR	Okay. MODE SELECT, LANDING RADAR.
	LMP	Where's my Velcro. No Velcro, huh?
	CDR	Should be. Right there.
	LMP	Oh, there it is.
	CDR	Just put it on that corner. It'll stay.
	CDR	Boy, I'll tell you, every time you float around, you knock something off over here.
04 11 58 48	LMP	I'm going to get on my restraints here, Gene.
	CDR	Okay. MODE SELECT, LANDING RADAR. Tape meter, H and H-dot.
	LMP	H-dot. I'll read it.
	CDR	Okay. Go ahead.
	LMP	LANDING alt - ANTENNA, AUTO.
04 11 59 00	CDR	Okay. LANDING ANTENNA is AUTO.
	LMP	RADAR TEST, LANDING.
	CDR	You put the camera away, didn't you? Oh, that's all right.
	LMP	What have you got?
	CDR	Yes, that's all right. I got that picture, anyway. Okay. RADAR TEST, LANDING. You ready?

	LMP	Okay. Power signal light out.
	CDR	It's out. It is, now.
	LMP	Well, it went out when you - -
	CDR	No, it didn't. It was still on, Jack.
	LMP	Was it?
	CDR	Yes.
	LMP	Well, I couldn't see it.
	CDR	Yes, it was way back in there.
	LMP	Okay. CROSS POINTERS, pegged up and left. They are.
	CDR	Any question about pulse?
	LMP	No. (Chuckle) Tape meter H should go to 8,000.
	CDR	8,000.
	LMP	And H-dot to 4 - minus 480.
	CDR	480.
	LMP	Okay. VERB 63 NOUN 12, option 2.
	CDR	The trouble is the landing radar test won't tell us anything about that transistor.
	LMP	That's all right. We've got to do it.
	CDR	Yes. It'll tell us something.
	LMP	Okay. VERB 66 is what?
	CDR	82, 87, and position 1.
04 12 00 02	LMP	That's good. Position 1. Go.
	CDR	Okay.
	LMP	Proceed.

	CDR	Okay. 67, minus 495 - -
	LMP	That's good.
	CDR	- - plus 1862 - -
	LMP	That's good.
	CDR	- - plus 1331.
	LMP	That's good.
	CDR	PRO?
	LMP	Yes. Well, no - no - VERB 34. Uh-oh.
	CDR	Okay. That's all right. That just said it wasn't an LGC. That just says defer a lockon. That's all right.
	LMP	Okay. RADAR TEST, OFF.
04 12 00 32	CDR	Okay. RADAR TEST is OFF.
	LMP	Altitude go to zero. Power signal on. CROSS POINTER's centered. I'm not going to be able to see that power light. I've used that to tell me when the radar dropped in and out. Okay. Read that again.
	CDR	CROSS POINTERs are centered.
	LMP	Okay. And the light's on, and we went to zero. Okay.
	CDR	But H-dot didn't; altitude did.
	LMP	No, it didn't say anything H-dot.
	CDR	Okay.
	LMP	PGNS, LANDING RADAR circuit breaker, OPEN.
	CDR	Okay. Breaker's open, and my power went to zero.
	LMP	Okay. We're a little late.

CDR Okay. Let's pick it up.

LMP Matter of fact, we ought to just about have AOS. And I'm - forward.

CDR You can pick up your camera when you want. I'll - Jack, on - -

LMP Okay. We've got them.

CDR Okay. Hello, Houston. Do you read Challenger? Hello, Houston. Do you read Challenger?

04 12 01 47 CDR Hello, Houston. If you're reading Challenger, we are undocked, and we are GO.

CC Challenger, Houston; very, very weak. Over.

CDR Okay, Houston. Challenger undocked on time. We are GO. Landing radar checkout is complete, and it is GO. And we are looking at America, the beautiful.

LMP Let me go to - let me go to HIGH GAIN.

CC Hey, Geno, I ... pass this on to you ...

CDR I'll wait until you get HIGH GAIN.

LMP Okay. Give me those angles again.

CDR Should be 9 and minus 37. How about 6 and minus 29 - 6 and minus 29.

LMP Okay.

CDR You got them?

CMP ... Okay.

CDR Five and 28 - 5 and minus 28.

CMP We're floating free out here. The Challenger looks real pretty.

LMP It's not going to hold yet.

	CMP	... P41, we're plus 1.9, minus 0.2 and zero. Undock and sep, on time.
	CDR	She's not holding yet?
	LMP	No. Houston, this is Challenger. Won't hold on the steerable antenna yet. It looks like I'm getting oscillations in my up-link signal strength, and then it gradually drops off to zero.
	CDR	Okay. On 16, STAB/CONTROL, ENGINE ARM, CLOSED.
04 12 03 38	CC	Okay, Jack. We're reading you better now. Understand.
	CDR	Okay, Gordo. If you're reading, you got the word. We are undocked. Landing radar self test was GO. We're ready to press on to the DPS throttle check, and we've been looking at America, the beautiful, in rare form.
	CC	Okay, Geno, we got that. It sounds good.
	CDR	Okay. And the residuals on P47 at undocking were zero, minus 0.1, and zero.
	CC	We copy that, and we'd like you to try the steerable antenna again.
	CDR	Here's your angles, Jack, zero and minus 30.
	LMP	There it is.
	CDR	Houston, we got it!
	LMP	Boy, do you ever.
	CC	You sound real good. Loud and clear.
	LMP	Okay. Let me give you some NOUN 20 angles, if you want them.
04 12 04 49	CC	Go ahead. Ready to copy.
	LMP	The LM: plus 301.09, plus 284.53, plus 359.48; CSM: plus three zeros 35, plus 104.67, plus 000.52. The time, 110:24:00. Over.

	CC	Okay. We got that.
	CDR	Okay, Gordo. We're ready - DPS throttle check. I'm ready to hit ENGINE STOP.
	CC	Stand by. Okay. We're ready.
04 12 05 42	CDR	Okay. And the light is on. Why don't you pick them up here.
	LMP	Okay. ENGINE ARM, ON - -
	CDR	MASTER ALARM.
	LMP	You got it.
	CDR	The reg light is on.
	LMP	TTCA, MIN.
04 12 05 53	CDR	Okay. MIN.
	LMP	Okay. You should be - -
	CDR	Eleven percent.
	LMP	That's good. Then soft stop.
	CDR	Okay; 52.
	LMP	That's good, max.
	CC	Roger. We're showing the ENGINE ARM circuit breaker may be out. Would you check that?
	LMP	ENGINE ARM is OUT.
	LMP	Oh, you missed that.
	CDR	I know. I thought you said yes.
	LMP	No, I'm sorry, I didn't hear you.
	CDR	Oh, I thought you gave me affirm on that.
	LMP	Okay. I'm sorry, Gordy, little - we missed that here. Okay. We'll try it again.

	CDR	No, I don't want to do that. Okay.
	LMP	Okay. Go ahead. That's good. Now to soft stop. Okay; max ...
	LMP	Adjust the friction?
	CDR	Okay.
	LMP	Okay. My turn?
	CDR	Yes.
	LMP	You - Let's see - -
	CDR	Let me give you the - -
	LMP	Give me the - L -
	CDR	Give you the LMP.
	LMP	You got it?
04 12 06 57	CDR	Okay. Wait a minute. You got it now?
	LMP	That's good. It's good. With me or you?
	CDR	Me. Okay. My friction's stiff.
	LMP	So is mine. Okay.
	CDR	Gordy, if the throttle test looked okay, I'll go ENGINE ARM, OFF.
	CC	Okay. It looked real good. Go ahead.
	LMP	Back on the CWEA. That's reset.
	CDR	Okay.
	LMP	ENGINE STOP, RESET.
04 12 07 41	CDR	Okay. You got light's out.
	LMP	THROTTLE CONTROL, AUTO, commander.
	CDR	AUTO, commander.

LMP TTCA, both to jets.

CDR And I'm jet.

LMP Okay.

CDR Okay. Why don't you give me the readings.

LMP Okay.

CDR Fuel.

LMP Okay. PROPELLANT to MONITOR. Okay. DESCENT 1 is - the temperature is about 67, both sides.

CDR Both GO.

LMP Pressures are about 75 - make that 85 and - -

CDR GO.

LMP - - 75.

CDR GO.

LMP And the temperature is - the other transducer is about - 68.

CDR That's good. Ox?

LMP Yes, those pressures won't change, because it's the same transducer. They didn't change.

CDR SUPERCRIT?

LMP Okay. AMBIENT PRESSURE, 1620.

CDR Okay. That is GO. Well, no it isn't; it's high. Okay.

LMP I'm sorry. AMBIENT is 1620.

CDR What's SUPERCRIT? 1260.

04 12 09 10 LMP Those are both GO. Okay. What else you want?

CDR DESCENT HELIUM, REG 1, talkback gray.

	LMP	Two, barber pole; 2 is barber pole.
	CDR	Okay, Gordy. The MASTER ARM is coming ON.
	LMP	Why don't you read them to me.
	CDR	MASTER ARM, ON. I got two good lights.
	LMP	Okay.
	CDR	DESCENT PROPELLANT ISO VALVE - ISO - ISOL VALVE - DESCENT PROPELLANT ISOL VALVE.
	LMP	FIRE.
	CDR	Okay. On my mark. DESCENT PROP ISOL VALVE; 3, 2, 1 -
04 12 09 40	CDR	MARK it. We heard it.
	LMP	Okay. We got a jar in pressure.
	CDR	Yes, I don't doubt that. Okay. What's the next one?
	LMP	Okay. Gordy, there was a slight - Gordy, there was a slight - There was an upward fluctuation in pressure in the manifold when we fired that. It's back to where it was prefiring.
	CC	That's what it should have done, Jack.
	LMP	Okay. (Chuckle)
	CDR	Let's go.
	LMP	Why didn't I ever hear that. Okay. Okay. HELIUM PRESS, DESCENT START, - FIRE.
	CDR	Okay.
	LMP	FIRE.
	LMP	HELIUM PRESS, DESCENT START - HELIUM PRESS, DESCENT START - Okay.
	CDR	... not going to do any good but - -

04 12 10 29	LMP	HELIUM PRESS, DESCENT START - 3, 2, 1 -
	CDR	MARK it. We got it.
	LMP	Hear that stuff gurgle (chuckle).
	CDR	Yes, that's good. The thing is coming to life, Jack.
	LMP	Okay. Looks good on board! About 240, both sides. MASTER ARM, OFF.
	CDR	It's OFF PROPELLANT TEMP MONITOR - DESCENT 1 and 2, no change. Say, Gordy, this thing sounds a little bit like my stomach sounded a couple of days ago (laughter).
	LMP	Okay. AMBIENT PRESSURE - 520 and stable. SUPERCRIT is 1260, still.
	CDR	Okay. You happy?
	LMP	Yes. Very happy.
	CDR	Okay; AGS. AGS STATUS to STANDBY.
04 12 11 24	LMP	AGS coming on to STANDBY.
	CDR	Can you pull that LCG breaker (laughter).
	LMP	I'm sorry.
	CDR	I'm starting to freeze. Oooh, that feels good though, I'll tell you.
	LMP	AGS STATUS to STANDBY.
	CDR	Can you - can you put that away?
	LMP	Sure.
	CDR	Oh, I hope that's the right one. Okay. MASTER ALARM and AGS light.
	LMP	Okay. STAB/CONTROL, AEA lights off.
	CDR	Okay. AGS warning light, off.

	LMP	It's off.
	CDR	Okay.
	LMP	AC BUS B, AGS, CLOSED.
	CDR	Do you have it? And the time was 110:52:00.
	LMP	Okay; got it. Okay; 110:52:00 for the time on the AGS.
	SC	AGS set at ... There it is.
	CDR	Okay. RESET.
	LMP	It's RESET.
	CDR	ATTITUDE MONITOR, LMP, AGS?
04 12 12 25	LMP	Okay. AGS, 412, read. Oops, oh, those are sensitive (laughter). Plink! 1. Okay. I want 000, - -
	CDR	Plus six 8s.
	LMP	- - 8, 8, 8, 8, 8, 8 - -
	CDR	And - Okay. 1, 2, 3 - minus.
	CC	Geno, we show Jack's SUIT ISOL valve in SUIT DISCONNECT. Should be in SUIT FLOW. Would you check that for us please?
	CDR	Yes, he's - he's in SUIT FLOW now. I tell you - I tell you, this LCG sure makes a world of difference up here.
	LMP	Okay, Geno, VERB 16 NOUN 65, and I want to set my time.
04 12 13 20	CDR	Hey, America; Challenger.
	CMP	Okay. Go ahead, Challenger. How you guys doing?
	CDR	Hey, Ron; listen. This ridge you're coming over; just stick your hand out the hatch and grab a rock.
	CMP	Looks like it's pretty low down there.

CDR Well, when you're up here looking at where you are, it even looks lower.

CMP (Laughter) I'll bet.

LMP Okay. Clock is counting. Looks good.

CDR You happy with your clock?

LMP Yes.

CDR Set AGS time using, is it about 4? Okay you're happy with it then? Let's just - let me just doublecheck our time. 110-hour base, you want - -

LMP 54.

CDR 54 - -

LMP Just 54.

CDR 540.1. That looks good to me.

LMP Okay.

CDR Okay; ready?

LMP Yes.

CDR 616 plus zero. Look at him down there will you.

LMP Beautiful. (Laughter) Okay.

CDR Give me - just give me that camera one time.

LMP You might get him over the landing site, if you're careful.

CDR I think f/11 against that surface, huh?

LMP Yes. Well, getting close to the landing site - f/8 or f/11. Okay. 224. I got numbers over here.

CDR Okay. You got the right numbers?

LMP I got them over here, now.

	CDR	Okay.
	LMP	60470. You want to read them?
	CDR	Yes, why don't I read them to you. Okay. 224 is plus 60470.
	LMP	Okay. That's ENTERED, we got a plus?
	CDR	I can't see a plus. Okay. 225 is plus 29364.
	LMP	29364. ENTERED.
	CDR	226 is plus 60386.
	LMP	60386. ENTERED.
	CDR	305 is plus 00594.
	LMP	00594. - -
	CDR	Right.
04 12 15 37	LMP	ENTERED.
	CDR	662 is minus 32772.
	LMP	32772 minus - -
	CDR	73 is minus.
	LMP	673.
	CDR	54404.
	LMP	54404.
	CDR	That's affirm. You want to read those out?
	LMP	Okay. Yes, I do. 224, plus 60470.
	CDR	Go.
	LMP	225 - -
	CDR	I can look at them.
	LMP	- - is - okay.

CDR That's a plus - just give me the sign.

LMP Plus.

CDR Go. 226.

LMP Plus.

CDR Go. 305.

LMP Plus.

CDR That's go. 662.

LMP Minus.

CDR That's go. 3 - 673.

LMP Minus.

CDR That's go.

LMP Okay. 574. You want a plus.

CDR Read it?

LMP Read it. It's plus.

CDR Okay. 604, read.

LMP Plus.

CDR Okay. Plus is not on the surface. That's good. 612, read. Plus 0, nominal.

LMP Zeros.

CDR Look at that! Wow! Okay. 232, read.

CC Challenger; Houston. I have a new AGS K factor for you.

CDR Standby a second.

LMP That's good. 232, okay. 233, read.

CDR Plus 00250.

LMP That's got it.

CDR 464, read.

LMP Plus 00500.

CDR That's good. 465, read. Plus 00195.

LMP That's good.

CDR Okay. 623, read. Plus all balls.

LMP That's zeros.

CDR 614, read, minus 60 - -

LMP 514?

CDR 514.

LMP Minus 60.

CDR 515, minus 44223.

LMP That's good.

CDR 16.

LMP Plus all balls; plus all zeros.

CDR Okay. Go with the K factor.

CC Okay; it's 109:59:59:94. Over.

CDR Pretty darn close.

LMP 109:59:59:94.

CDR Gordo, this is spectacular. It is absolutely spectacular, looking at that command module, America, down there coming across the surface. We're just tracking him at about a 30-degree dive angle.

	CMP	Okay, Challenger; America. Good luck on your PDI burn down there. I'm going to track your landmark for you.
	CDR	Okay, babe. Have a good time and go get that landmark.
	CMP	Will do.
	CDR	Don't forget; no TEI. See you in about 3 days.
	LMP	VERB 47.
	CDR	Okay; coming at you.
	LMP	I'm going to try to get him. If we're still in attitude.
	CDR	Come on, babe.
	LMP	Okay. 59:59:94.
	CDR	109:59:59:94.
	LMP	That's good.
	CDR	Okay.
	LMP	That's good. Proceed.
	CDR	And you want the four - -
	LMP	Wait a minute - High bit rate?
04 12 19 22	CDR	Okay. I just PROed. I PROed.
	LMP	Okay. That's good. So did I.
	CC	Geno, Houston; with a couple of items.
	LMP	You got it already.
	CDR	Yes. Go ahead, Gordo.
	LMP	Look at that, look at where he's coming over.

	CDR	Hey, we got the landing site, Gordo!
	CMP	I got it, too.
	CDR	Hey, Gordo, we got the landing site. We're coming right over the front of it! Stand by a minute. You can see the Slide. I think you can see the Great Cross.
	LMP	The light mantle (laughter).
	CMP	... beautiful.
	CDR	We'll get a picture of America coming right across it.
	CC	Okay.
	LMP	Super targeting.
	CDR	Gosh, we've got Family Mountain. We've got - of course, the massif. We can see the Scarp; we can see the light mantle; I've got the Great Cross; Camelot; Sherlock.
	LMP	Believe it or not, Houston, they're all there. I see possible structure - possible structure of the upper part of the South Massif, little bit east of station 2. It's subhorizontal, dipping to the southeast.
04 12 20 42	CDR	Houston, I can even see Poppy right where we're going to set this baby down. Matter of fact, I can see Rudolph. I can even see the triangle: Rudolph, Frosty, and Punk. Man, Gordo, this is absolutely spectacular! We could watch Ron track - we could watch Ron track right on through the landmark. I don't know what kind of results he got, but he sure had a nice smooth track from here.
	CMP	Beautiful results.
	LMP	Let's go to work, Geno.
	CDR	Let's go, babe.

	LMP	Okay. You get your 400 plus 3.
	CDR	Gordo, you can go ahead and update us with those words.
	CC	Okay. Your perilune is shifting west. PDI will be a little -
	LMP	Let me do another one.
	CC	- - be a little higher than nominal: 10.7 miles or 65,000 feet; should be no problem. And, from the time you first came around until we had a solid lockup on the steerable on this acquisition was about 3 minutes. We're going to try to speed that up some on the next time around. We'd like you to just keep trying the steerable until we come to you - and say, "stop trying." Over.
04 12 22 14	LMP	Okay, Gordy, understand that; and apparently this time, had I let it - had I waited a little longer, it would have dropped to zero and then come up, because that's what happened when I finally got you. I'll give it more time next time.
	CC	Okay.
	LMP	Look at those ridges. Gosh darn, if those mare ridges aren't extrusive, I'll eat my hat.
	CDR	You want to set your - check your VERB 54?
	LMP	Okay. Okay. That's good. Well, that's pretty close - so close.
	CDR	Okay. You got the pads, and I'll press on.
	LMP	Okay. What did I have there, as a note? Oh, that's - yes - -
	CDR	I'll make the AGS control checks while you get the pads. We're going - we got to get a P52 here pretty soon. Okay - We're a little behind.
	LMP	All right. Okay, Gordy, go with the pads.

	CC	Okay. The first one is a P76 for the CSM circ.
	LMP	Go.
	CDR	Suits me.
	CC	Okay. NOUN 33 is 111:57:30.09; NOUN 84: plus 0070.5, plus five zeros, and minus 0000.5. Go ahead.
	CDR	... for a minute there, they were all ...
	LMP	Okay. 111:57:30.09; plus 0070.5, plus all zeros, minus four zeros 5.
	CC	Okay. Good readback. Next one I have is the no PDI plus 12 abort, item Echo.
	LMP	Go ahead.
	CMP	... the last ... take a ... with the lunar sounder.
	CC	Okay. Echo is 113:02:00.00; Foxtrot, plus 0103.4, plus five zeros, minus 0050.0; NOUN 42: 0142.0, plus 0005.4, 0114.9; burn time is 0:48; 000, 272; 373 - -
	CMP	Challenger, America, ...
04 12 25 44	CDR	Okay. Just a second. Give me a transponder, and we'll start with the radar. Jack's tied up right now.
	CMP	Okay. Transponder's coming on at ...
	CC	373 is 0182.0; AGS DELTA-Vs: plus 0103.7, plus five zeros, minus 0049.3; Golf, 113:57:00.00; Hotel, 11 - Okay, I'll start over. 115:36:45.00; and the no DOI-2 DELTA-V_X, 0096.6. Two remarks: throttle profile is 10 percent for 26 seconds, 40 percent for the rest of the burn. Over.
04 12 27 15	LMP	Okay, readback. 11 - no PDI plus 12 - 113:02 all zeros; plus 0103.4, plus all zeros, minus 0050.0; 0142.0, plus three zeros 5.4, 0114.9; 0:48; all

zeros, 272; 0182.0; plus 0103.7, plus all zeros, minus 0049.3; 113:57 all zeros; 115:36:45.00; 0096.6; remarks: throttle profile 10 percent for 26 seconds; 40 percent for the remainder.

CDR Gordo, we need VOICE, RANGE when you can get it.

CC Okay. That's a good readback. Item India: - -

CDR Any way he - Can he wait?

CC 112:49:52.35 - -

CDR Say, Gordo, Gordo, Gordo. Hey, Gordo - -

CC Go ahead.

04 12 28 21 CDR - - stand by. We want to finish the radar VHF test; and when I go to P52, you can finish the pads.

CC Okay.

LMP Okay. We need VOICE, RANGE.

CMP ...

04 12 28 45 CDR Okay. We're in VHF RANGING, and I've got you on radar, Ron. And we'll be quiet for a second and see if you can get a lockon.

CMP Ah-ha, it worked!

LMP Say: We got your tone, Ron! We got your tone!

CMP Okay. 0.50 at 09 miles.

SC ... There you go.

04 12 29 34 CDR Okay, Gordo. The VHF ranging and radar checks out very well.

CC Okay; sounds good. Tell me when you're ready for item India again.

	LMP	Okay. Wait a minute. - Let's wait a minute, okay. VERB 34 - let me turn - well, you can, well, wherever you do that to him - okay, VOICE, yes. We cut you off, Ron.
	CC	Okay. We'll turn the RANGING, OFF. We'll try it that way.
04 12 30 10	LMP	Go ahead, Gordy.
	CC	Okay. India is 112:49:52.35; 11:01, plus 0002.2; attitude is 002, 108, 290; plus 56900; Juliett, 115:36:45.00; Kilo, 117:35:45.00. Go ahead.
	LMP	Okay. It's a PDI pad; 112:49:52.35; 11:01, plus three zeros 2.2; 002, 108, 290; plus 56900; Juliett, 115:36:45.00; Karen, 117:35:45.00. Go ahead.
	CC	Okay. That's a good readback. Lima is 113:14:24.91; Maytro [?], 119:34:30.00; and November is 114:57:19.09. And your T-2 at PDI - T-2 will be at PDI plus 24:33.
	LMP	24:33?
	CC	That's affirmative.
	LMP	Okay. Linda is 113:14:24.91; Mary is 119:34:30.00; and Nancy is 114:57:19.09.
	CC	That's a good readback.
	CDR	Okay, Jack, I'm ready on the P52.
	CC	Okay. One thing left, Jack, is the SHe pressures on the PDI page.
	LMP	Go ahead.
04 12 33 30	CC	Okay; at T_{ig}, the pressure will be 13010; plus 1 minute, 1410; 2 minutes, 1400; 3 minutes, 1310; and 4 minutes, 1230. Over.
	LMP	Okay. I got those. Thank you.

	CDR	We got the Earth in the top of this thing. That was a Y, Jack, do you concur?
	LMP	That was a Y.
	CDR	Huh?
	LMP	Yes, it was a Y.
04 12 34 31	CDR	Okay.
04 12 35 47	CDR	Another Y?
	LMP	Yes, sir.
04 12 36 18	CDR	This the third Y?
	LMP	Right. Four Ys.
	CDR	Okay.
	CDR	Sirius, Castor, Pollux, and the Earth.
04 12 36 53	LMP	I'm on Procyon.
04 12 38 41	CDR	Try not to push me if you can.
	CDR	It's an X?
	LMP	...
	CDR	Huh?
	LMP	That's right.
	CDR	Okay.
	LMP	The intercom was off, to copy those pads.
	CDR	Every time you do that - -
	LMP	Sorry.
	CDR	If you could help it - This thing is really sensitive. I didn't like that. I would have rejected. That's it. Okay.

	LMP	Three?
	CDR	Four. Okay. I like those. I can't mark them any better. Okay. Next star is what?
	LMP	Stand by. Star is Aldebaran. 211.
	CDR	Okay. That's what we got.
	CDR	289. That should be easy to follow. Would you believe Orion? Would you believe our footpad or something up there - radar? Can't be our footpad.
	LMP	See the command module in earthlight?
	CDR	Yes, I saw it a little while ago. That's Aldebaran all right.
	LMP	Okay. Let's try X first.
	CDR	Okay. Go ahead.
	CDR	Certain places in this telescope you can see double line. Okay. That was a good one.
	CMP	Challenger; America. How do you read on SIMPLEX A?
	LMP	You're loud and clear.
	CMP	Okay; got you loud and clear, too.
04 12 41 41	LMP	Two and X.
	LMP	Didn't like it.
	CDR	Just like the simulator, you can move your eye position and the star moves. Isn't that beautiful? Okay. For Y.
	LMP	Okay. You got four X's.
04 12 42 52	CDR	Boy, I tell you, this is the hardest alignment in the world. Ron ought to be thankful.
	CDR	One.

04 12 44 08	CDR	Got two Y's.
	LMP	Okay.
	CDR	Three Y's.
	CMP	Okay. PROCEED there. Okay. Challenger and Houston, I'm maneuvering to circ burn attitude.
	LMP	Roger, America. Have a good burn.
	CMP	Okay; sure will.
	LMP	You look just as pretty in earthlight as you do in sunlight.
	CMP	Oh, great!
	CDR	Well, my eyes aren't any better than that, Jack.
	LMP	Okay. Can't argue with that.
	CMP	And, Houston; America here. While we're maneuvering, I'll go to RECEIVE on the - -
	CDR	My eyes are not any better than that.
	CMP	- - VHF, and you can send those pads E to N up.
	CDR	Okay.
	CC	Looks like a good job.
	CDR	Ready?
	LMP	Yes.
	CDR	Yes, but it's not an easy one, Gordo.
04 12 46 01	CMP	Hey, Challenger; America.
	LMP	Go ahead.
	CMP	Okay, Jack, can you go to RECEIVE only on your VHF, there? I've got all these pads to pick up now. I'll call you when - when I'm all through.

	LMP	Okay; RECEIVE only. We got your GO, Gordo?
04 12 46 23	CC	Go ahead; torque them.
	CDR	Yes, I guess you did copy them.
	LMP	Yes, I got them.
	LMP	Okay. Now we want to do some other things with our - Where are we?
	LMP	Okay. We POO, ENTER for no coarse align. Okay. PRO.
04 12 46 50	CDR	So we PRO and ENTER.
	LMP	Okay; 216 - Use - -
	CDR	I want 001, huh?
	LMP	Yes.
	LMP	Okay. I got zero in there.
	CDR	Okay; 3, 3. Let's go - See where that puts it. Oh, shoot, you know what I did, smart guy. I got ahead - I got ahead of the game a little while ago so I - so I took this out.
	LMP	Who's this, who's this, who's this?
	CC	Challenger, we need AFT omni and select the steerable to SLEW - -
	CDR	That's mine.
	CC	And LOW BIT RATE.
	CDR	Half a degree up and zero left and right.
	CC	Challenger, select FORWARD omni, please.
	LMP	Say again.
	CDR	Up - elevation half a degree up and zero on azimuth. Okay.

	LMP	Darn.
	CDR	Where's our DAP? Okay.
	CDR	Okay. You CL?
	LMP	No.
04 12 49 01	CDR	Okay, Gordo. The COAS align is good, and the DAP is reset.
	LMP	Turn your AOT lamp out?
	CDR	Okay.
	CC	Okay; and like the rest of the spacecraft, the platform's beautiful; there's no drift compensation or PIPA bias update. Over.
	LMP	Fantastic.
	CDR	Beautiful! No PIPA bias or drift compensation. Boy, I hope it stays that way. What do you want, AOT?
	LMP	This doesn't sound like a sim.
	CDR	You centerline?
	LMP	Yes, open. Yes, I'm all set.
	CDR	Okay.
	CMP	Okay, Challenger; America. I'm through with all the pads now.
	CC	Roger. Give you one update. You can write it in the timeline, page 8; the T-1 time is PDI plus 17:00. Over.
	CDR	17:00. Okay; T-1 is PDI plus 17:00; we got it.
04 12 50 03	CDR	Now where are we? Did we do all this? Okay. That's good we got all that. How are we; on time? Little behind - let's press.

	CDR	He got it?
	LMP	Okay, Houston; you've got POO and DATA.
	CC	Okay.
	CDR	That clock counting down anything?
	LMP	Yes; DOI-2.
	CDR	Okay.
	CDR	Know we got a maneuver to the AGS cal - -
	LMP	Now, wait a minute.
	CDR	I guess I can't do that while - -
	LMP	Yes. Go ahead.
	CDR	ROLL of 24. I'm about there. PITCH is 77 - I got to go up a ways - and YAW 339. Guess I can't maneuver while he - Are you in high gain?
	LMP	No, moving omni.
	CDR	Gordo, can I start maneuvering to the AGS cal while you're getting those updates - up-links ready?
	CC	Okay. We'd like the steerable back again. Try PITCH of minus 25, and YAW of minus 72.
	CDR	Minus 30 and 72.
	LMP	That's 72 plus - -
	CDR	Minus.
	LMP	Minus.
04 12 52 26	LMP	Okay; you got the steerable.
	CDR	Okay. And I can see the Earth - -
	CC	... HIGH bit rate.

CDR - - so my maneuver is not going to hurt them.

CDR I'll start over.

CC ... up-links now, we'll get that in before we go to the AGS cal attitude. Over.

CDR Okay, Gordo, I've got - I've got the Earth and the direction I have to maneuver is nothing but good for the high gain, so I'll start over slowly.

CC Okay.

04 12 53 38 CDR Boy, I tell you, those - those P52s are hard. P57s are hard, in this thing - you - you - you attenuate - you can either attenuate the star or you - or you can attenuate part of the line or make the line double and it's really - it's really - I remember it that way in the past. You know while we're - while we're doing that could you - Well, we can do that on the surface. Yes, we can do that on the surface.

LMP Well, I mean -

CDR Unless you can ... move this over.

LMP Yes.

CDR Forget it.

LMP Yes. Let's - -

CDR It won't bother me. We got to land first, anyway.

LMP Hold that please.

CDR Okay.

LMP Thank you.

CDR Jack, I think I discovered something.

LMP What?

CDR There's no light in there. I don't know if there was ever supposed to be, but there isn't.

	CDR	No. You may have a hard time seeing it.
	LMP	I think there will be enough light in the cockpit because it'll be daylight.
04 12 55 50	CDR	We got all the pads?
	LMP	Yes. I updated times in there, too.
	CDR	That's good.
04 12 56 04	CC	Challenger, Houston. It's your computer. UPDATA LINK, OFF.
	LMP	Roger.
	CMP	Hey, Challenger; America. Are you still with me?
	LMP	Still with you.
	CMP	... something like ...
	LMP	Something like what?
	LMP	Say again, Ron.
	CMP	Okay. I just want to make sure on the voice check if we still have the VHF problem.
	LMP	Okay. I'll have to give you another one here in a minute.
	CDR	Going to have to -
	LMP	AFT - in DATA - You record your initial values?
	CDR	Yes.
	LMP	Okay.
04 12 57 19	LMP	I'll check them again when we have attitude, but they shouldn't change.
	LMP	Okay. How do you read?

	CMP	Okay; loud and clear. How me, Jack?
	LMP	You're loud and clear.
	CMP	Challenger, America. Read you loud and clear. How me?
	LMP	You got - you got all these.
	CDR	Yes.
	LMP	You there?
	CDR	Yes. Let me - -
	CDR	We are all within limits, Jack.
	CDR	We are all within limits, Jack.
	CMP	Houston; America. Roger. We'll do our best.
04 12 58 12	CDR	We're all within limits. If I can perturbate one, I'll perturbate them all.
	LMP	Okay. You ready to go, then?
	CDR	Yes.
	CDR	You in 3?
	LMP	3.
	CDR	Okay; at 30 - 38:30.
	CDR	My suit feels shorter.
	LMP	Like Charlie said; you grew.
	CDR	This water is a lot less airy, after I got the first few gulps out.
	LMP	Oh, you been drinking on me, huh?
	LMP	I guess I better fix this.
	CDR	I guess I better change mags.

	LMP	Can you look in there and find out - Is there anything on cameras?
	CDR	Yes. Way back here. We skipped it. Camera setting for cabin - Oh, for cabin photos.
04 12 59 26	CDR	You take cabin photos during rendezvous.
	LMP	Okay.
	CDR	We don't want to worry about that.
	LMP	Want to do that now?
	CDR	It's too dark.
	LMP	Yes.
	LMP	I don't think we're going to have time. How about -
	CDR	Jack, I don't see anywhere.
	LMP	I think it was supposed to have been this one. But I have only 50 percent left on this one.
	CDR	Okay. Use - I changed mags, so we can always use that other one - but I don't know what your settings are. They aren't in here. Are they supposed to be?
	LMP	Yes. They're - -
	CMP	...
	LMP	- - They're there somewhere.
	CDR	Can you get to the ISA.
	LMP	Yes.
	CMP	... Align the old GDC.
04 13 00 28	CDR	I thought I put it in the top pocket.
	LMP	No, I think it's in the bottom.
	LMP	Yes, give me mag Oscar. Unless that's the one I had on there. No, give me mag EE.

	CMP	Okay. GDC is aligned.
	LMP	Give me the spare one.
	CDR	Which one is that?
	LMP	EE, EE.
	CDR	You want to put the other one in your side kit somewhere?
	CMP	STAB CONTROL and SPS breakers are CLOSED - -
	CDR	Because that's not done.
	CMP	- - MANUAL ATTITUDE to RATE COMMAND. LIMIT CYCLE, OFF. DEADBAND, MIN. RATE to LOW.
	CDR	Where's that other mag?
	LMP	It's right here -
	CMP	... RATE COMMAND.
	LMP	Right here; I'll get it.
	CDR	Why don't you just mark it "undocking" or something.
	LMP	Yes, I will.
	CMP	Okay. DELTA-V_{CG} is in CSM. GIMBAL DRIVE, PITCH and YAW is in AUTO. Standing by for the bus ties.
	LMP	He shouldn't do it.
	CMP	Okay.
04 13 02 03	CDR	Ready when you want those numbers. Okay.
04 13 02 21	CC	Challenger, Houston. You're GO for DOI-2.
	LMP	Thank you, Gordo. We're GO here for DOI-2.
	LMP	Okay. What are the numbers?

	CDR	Okay; f/8 at 500 in infinity.
	LMP	How many frames? Twelve?
	CDR	Wait a minute - That's a DAC. Camera - -
	LMP	That's what I want.
	LMP	Yes, twelve frames per second; f/8 and infinity, huh?
	CDR	Yes, infinity doesn't seem right, but I guess it is. 1/500; f/2.8, 1/500, at infinity.
	LMP	Okay; I got it. Tapes no good anymore.
04 13 03 16	CDR	Want a piece of tape?
	LMP	Yes. Just a small one. Real small one. Inch.
	CDR	Let me know when your test is over when you get a chance.
	LMP	It's over.
	CDR	Oh, it is over?
	LMP	Yes.
	CDR	Okay. Why don't you give me your numbers?
	LMP	Okay. Wh - Where's that extra mag, first?
	CDR	Right here. Let me - Let me just write something on it.
	LMP	Okay?
	CDR	...
	CDR	You got a place over there you - -
	LMP	Yes, I'll put it - I'll put it away in just a minute.
	CDR	Okay. Give me your numbers.

	LMP	40 -
	CDR	The first one? Minus 0.3. I can't read it.
	LMP	Minus 3.
	CDR	Okay.
	LMP	Plus 7.
	CDR	Okay.
	LMP	Plus all zeros, plus 32, minus 87 - 6 - minus 63. They all look all right to me.
04 13 05 20	CDR	Okay. Are they all - Yes, that's within that. That's a little more than usual, but not much. Okay; pretty small.
	LMP	Okay. While you do this, I'm going to go pick up - We got to go - LOS is 111:48. We got about 3 minutes and you want to configure it.
	CDR	Okay, Houston. Did you get the AGS cal numbers?
	CC	Yes, that's affirmative.
04 13 05 58	LMP	Okay. It all looks pretty good to me. 546 may have been a little more than spec, but it looks pretty good.
	CC	...
	CDR	You can go ahead. Since we are not LOS yet, I can target for DOI.
	LMP	Here's your helmet. Keeps - Or is that my helmet? I think we've lost track of helmets.
	CDR	No, mine has got a name on it.
	CC	Jack, have you gone to an omni? If you have, go LOW BIT RATE.
	LMP	What's the omni?

	CDR	He was down here a little bit ago; he was in front of us, I think - -
	LMP	Okay. We got you on an omni and LOW BIT RA - -
	CMP	...
	CDR	Can we target DOI?
	LMP	Yes, if you want.
	CDR	Yes, we'll pick this up - -
	LMP	I checked those - -
	CDR	Okay.
	LMP	- - EPS and APS; I haven't.
	CDR	Recycle the breaker. Okay, are we - Is your - Is your ... going ape?
	LMP	Okay. Where do you want it?
04 13 07 12	CDR	Okay. Match indicated angles at LOS. Did we just have LOS?
	LMP	Not yet. We're on an omni.
	CDR	Okay. Match indicated angles - and TRACK MODE to SLEW.
04 13 07 23	LMP	Okay. It's TRACK MODE, SLEW; and what's the new angles? Plus 90 and minus 45?
	CDR	Plus 90 and minus 45.
	LMP	Be a little more gentle with this thing than the simulator.
	CDR	Okay. That's LOS.
	LMP	Just missed their set.
	CDR	Ron, do you still read us?

	CMP	Yes. Loud and clear; how me?
04 13 08 05	CDR	Okay. You're loud and clear.
	CDR	Okay, Ron, I need some - -
	LMP	Jack.
	CDR	Jack, I need PCM LOW when you finish -
04 13 08 16	LMP	Okay. That's LOW.
	CMP	Challenger; America. Do you read me?
	CDR	Yes. We read you loud and clear.
04 13 08 22	LMP	SQUELCH is ENABLED.
	CMP	Okay. You're still clipping a little bit. All I got was the clear, but that's all right.
	CDR	Okay, Ron. We are reading you loud and clear.
	CMP	I got that part, loud and clear.
	CDR	Okay. Up-link SQUELCH, ENABLE.
04 13 08 35	LMP	It's ENABLE.
	CDR	Another comm check; we just did. I'll load P30.
	LMP	Okay. I'm ready for you.
	CDR	Okay.
	CDR	You all set?
	LMP	112:02:4 - 40.92.
	CDR	Okay.
	LMP	Okay; minus 0007.5 - 7.5, and the rest are all zeros.
	CDR	They give you a burn time on that?

	LMP	Yes, 22 seconds.
	CDR	We're low, so they - they anticipated that.
	LMP	Okay.
	CMP	Coming up on 8 minutes -
04 13 09 31	CMP	MARK it.
	LMP	Okay.
	CDR	Okay. What else do you need?
	LMP	They said 115 or 615 - 615, excuse me, and 6.7.
	CDR	Okay. That's pretty good - 7.5.
	LMP	Yes.
04 13 10 02	CDR	Clock is right on.
	LMP	I am not in ORB RATE.
	CDR	Okay.
04 13 10 38	CMP	Okay. We have HIGH BIT RATE, COMMAND RESET. Okay. BAT BUS B. What? ... A/C. ... coming up on a minute. ... good shape.
	CDR	Okay. What do I need to put in the AGS, here?
	LMP	410, minus 5, external DELTA-V.
04 13 11 14	CMP	Okay. HELIUM VALVES are ... 2A. SERVO POWER 1, got it; 2 is going ON. Okay. The old computer's going to AC.
04 13 11 26	CMP	DIRECTs are OFF. BMAGs are OPEN. Okay. No hardovers.
04 13 11 34	CMP	Go to SCS. Okay. PITCH 1, got it. YAW 1, got it. Okay. Trim - and ... mode.

04 13 11 59	CMP	Okay. Try a little TVC to TVC. TVC to TVC - TVC. Woo! We're banging around. Okay. Get these checks on this rev. Okay. Now, let's see now; where were we here? No MTVC.
04 13 12 27	CMP	Okay. SPACECRAFT CONTROL back to CMC, returns to 0. Go clockwise. No MTVC.
04 13 12 37	CMP	Okay. GIMBAL MOTORs, PITCH 2, got it. YAW 2, got it. Okay; got a little trim. Plus 0.4. ... Okay. TVC to TVC, TVC to TVC. Looking good.
04 13 13 01	CMP	Okay. Neutral, returns to 0. Okay; no MTVC.
04 13 13 12	CMP	AC/DC on the old POWER. ... to DIRECTs. Uncage the old BMAGs. Okay.
04 13 13 21	CMP	BMAGs are RATE 2. Let's KEY RELEASE. ... PROCEED.
	CMP	... 06:15. ... shows we're there. Uncaged the old BMAGs. ... now 50:18. Okay. Try the gimbal test option. Plus 2, minus 2, 0. Plus 2, minus 2, 0. 1, 2, 3, 4 -
04 13 14 09	CMP	Ah-ha, we have trim. ... plus 0.9.
04 13 14 16	CMP	Three minutes and 15 seconds to go. 59 plus 9. DELTA-V_c. Burn time is 3 seconds. Shutdown at burn time plus 1. We'll ... with the DIRECT, ON. Single-bank burn. We'll use bank A. (Humming)
04 13 14 58	CMP	Okay. Let's - 16 AUTO RCS SELECTs are ON. Circuit breakers - all in good shape. ..., ON. ... CMC, ... TVC. Woo! A good one there. Rate COMMAND ...
04 13 15 26	CMP	DEAD BAND, MIN. Okay. ... TRANS CONTROL POWER is ON.
04 13 15 31	CMP	AC/DC, AC/DC. DIRECT, DIRECT. CMC in AUTO. Uncaged, uncaged, uncaged. RATE COMMAND. GIMBAL MOTORS.
04 13 15 40	CMP	CSM RCS LOGIC. GIMBAL DRIVE's in AUTO.
04 13 15 50	CMP	Okay. About 1 minute to go, shortly.
	LMP	He ..., huh?

	CDR	No.
	CMP	Okay. ECS looks good. One minute.
	LMP	All right, I got a good hack - where he is about now because he - for - for visual, you can -
04 13 16 37	CMP	Okay. EMS is going NORMAL. The old TRANS CONTROL POWER's ON. ... DELTA-V THRUST A switch. ... ullage.
	CDR	I missed that one. We didn't do that.
	CMP	Okay. - -
	CDR	Want to do it again?
	LMP	We didn't get my - we didn't get me a vector. Can you do that now?
	CDR	Yes.
04 13 17 03	CMP	- - ... THRUST A is ON. You guys still with me?
	CDR	Yes, sir; we're with you. Ready?
	LMP	Go ahead. ...
	CMP	... with me?
	LMP	Oops.
	CDR	Yes, sir; we are with you.
	CMP	Okay. At 17 seconds -
04 13 17 19	CMP	There's ullage. We have ullage. 99 - -
	CDR	You're right; we didn't do that.
04 13 17 31	CMP	Oh-ho! ... for shutdown! Oh-ho! Beautiful burn!
04 13 17 38	CDR	Sounds great, babe. You got circ.
	CMP	(Laughter) Okay. ... - -
	CDR	Did you get it? You did get it.

	LMP	Here, let me get the - -
	CMP	- - ... some circ. ... a heck of a burn - -
	CDR	You ought to give it a 400, too, because it is going to - -
	CMP	- - ... pretty soon. Be minus 0.9. Okay. Let's proceed on that. Turn the old GIMBAL MOTORs, OFF.
04 13 18 04	CMP	2, got it. 2, got it. 1, got it. 1, got it.
	CDR	Okay. We're in 41.
	CMP	Ah-ha! Okay. Did you guys get the word? The burn is complete.
	CDR	Yes, sir. We got the word. The burn is complete, Ron.
	LMP	You on T/R?
	CDR	Yes.
	CDR	Ron, do you copy Challenger? We copy your burn.
	CMP	Okay. Burn is complete. We're ... residuals.
	CDR	Have at it.
	LMP	Okay. I'll time it, Gene.
	CDR	Okay. VERB 77 -
	CDR	NOUN 40?
	LMP	See, we - our range rates should be -
	CDR	What's wrong?
	LMP	Nothing. I just wondered why they had - I never remember seeing that there. You happy here?
	CDR	Yes. I'm all set.
	LMP	Foot per second - Does that sound right for del - for range rate, right now?

	CDR	Yes, you should be coming through about zero. He's at the other end of the football?
	LMP	Yes.
04 13 19 58	LMP	Integrating to -
	CDR	Minus 4.7 on the ... - -
	LMP	Okay. ... foot for that range and ... - -
	CDR	Okay. What you got for range?
	LMP	That's good.
	CDR	Okay. That's pretty good.
	CDR	Okay. I'm set.
	LMP	Okay. That - Within the dead band, that's as close as I can keep Y and Z.
	LMP	Surprised they didn't call us on that. Not watching my AGS, as usual - -
04 13 20 34	CDR	Ron, we're 210 from the burn.
	CMP	Okay. Copy you.
	LMP	Hey, let's check your perigee after the burn.
	CDR	Okay. Okay, that's minus. I'm in the attitude. I want to thrust down on the hand controller. I'm in jets.
	LMP	Okay. I am too. I'll time it.
04 13 21 00	CDR	Have a KEY RELEASE there. That'll go blank at - at average g.
	LMP	Should I watch the thrusters? And if the limit is 30 seconds, if it's a two-jet burn, we'll have - after 30 seconds, we pitch 180 and - -
	CDR	Okay.
	LMP	- - complete with the AGS.

	CDR	With this short burn, we'll just take what we got at 30 seconds.
	LMP	And as - the - it - less trimming you do, the better the AGS will be.
	CDR	Okay.
	LMP	You know, less pulsing. But don't - don't let that scare you (laughter).
	CDR	Just want to see what kind of - because I got four jets on there, so I want to see what kind of - Here's the terminator.
04 13 21 45	CDR	We're a minute, Ron. And we're burning right at the terminator, Ron.
04 13 21 55	CMP	(Laughter) Okay. I got a 70 by 54.7.
	LMP	That sounds familiar.
04 13 22 09	CDR	Okay. The DSKY is blank.
	CMP	Okay.
	LMP	Okay. I want to thrust down minus-X.
	CDR	Yes, sir. That way because we're going that way. Okay, 22 seconds.
	LMP	Have at it.
04 13 22 48	CDR	We're burning, Ron.
	CMP	Beautiful.
	CDR	0.7 at a crack.
	LMP	Well, that's it.
	CDR	Zero plus 0.1.
	LMP	Plus 0.1.
04 13 23 46	LMP	61.4 by 7.0. Okay.

	CDR	Used a little gas on that one, didn't we?
	CMP	I guess your burn is complete, huh?
	CDR	Burn's complete and GO, Ron. We're in a 7-mile perigee.
	CMP	Okay. Your burn was complete - -
04 13 24 05	CDR	AGS, ... - -
	LMP	647 and 315, 61.4.
	CDR	Great! Right on.
	LMP	6.7 is what the ground predicted so - -
04 13 24 19	CDR	Okay. AGS is with you. Okay - -
	LMP	Okay.
	CDR	- - let's do a VERB - P76.
	LMP	Okay.
04 13 24 27	CDR	Ron, you got the word? You can update our state vector.
	CMP	Okay. We'll update your state vector.
	CDR	You got the P76 for him?
	LMP	Yes. Go ahead. It's - -
	CDR	You ready?
	LMP	- - on time. 111:57:30.09.
	CDR	Okay. That's good. DELTA-V?
	LMP	Plus 70.5.
	CDR	Okay.
	LMP	Plus all zeros and a minus 0.5.
	CDR	Like that, huh?

LMP That's it.

CDR Okay.

LMP Okay. Shoot!

CDR What's wrong?

LMP I was in HIGH BIT RATE for the burn, (laughter) because we have - We missed that AGS. ... - -

CDR Oh, that's all right.

LMP Well, it doesn't mean - it means we didn't - they didn't get the data on the burn.

CDR I'm going out to PDI attitude.

LMP Okay. You ready to -

CDR Ron, we hold you in a 70.1 by 55.0.

CMP That's pretty good. I get 70.0 by 54.7.

CDR Okay. I am ready to give you the vector. Okay.

LMP I am in HIGH BIT RATE. Go ahead.

04 13 26 23 CDR You got it coming at you.

CMP (Laughter) Forgot to look at the chamber pressure on that.

LMP Should be a pen floating around. Is that your pen?

CDR Yes. I been putting it there.

CDR Okay. I guess you got your update.

LMP Yes.

CDR Okay, 71.3. How does that - 71.3.

LMP Okay. That's good.

CDR And 71 feet per second.

	LMP	Okay. Happy?
	CDR	Yes. Okay. You can go PCM LOW; and 373.
	LMP	Okay. Well, I got a new one on that somewhere.
	CDR	I'll go into the algorithm test.
04 13 28 19	CDR	I'll wait until you for sure get a good high gain on them; otherwise, we'll screw that thing up. Okay?
	LMP	Okay. How long until AOS?
	CDR	Oh, it's 25 minutes.
	LMP	Okay.
	CDR	Okay. We got the next milestone. We're counting down to PDI.
	CDR	Case - in case you're interested, America, we got 41 minutes to PDI.
	CMP	Ah-ha. Okay.
	LMP	Well, I've lost two things. A pen and a right-angle bracket.
	CDR	For the mirror up there?
	LMP	No, the - oh, here it is. Here's the right-angle bracket. Never took it off.
	CDR	Use my pen.
	LMP	Well, I just hate to have anything lost.
04 13 30 58	LMP	The used magazine - a partially used magazine, in this case.
	CDR	Let's try and mark some of those magazines, so we'll know which ones are which.
	LMP	Yes. You got that one, didn't you?
	CDR	Pardon?

	LMP	You marked that one?
	CDR	Yes, I marked it - undocking lunar orbit.
	LMP	And the landing site, too, on that.
	CDR	Yes. Yes.
	LMP	And, let's see, I don't see the fountain pen. Okay. You got the algorithm?
	CDR	Not yet.
	CDR	Getting up to attitude here.
	LMP	COAS is in the overhead window.
	CDR	Yes, sir.
04 13 31 59	CDR	Okay; restraints? Then you'll go INERTIAL. So that's I can - I got my restraints.
	CDR	FDAIs are now INERTIAL.
	CDR	Why don't we put our helmet and gloves on?
	LMP	I think that's a good idea.
	CDR	You do that pretty quick.
	LMP	Gene Cernan.
	CDR	Okay. I'm not ready yet. Wait.
	LMP	Oh, I'm sorry.
	LMP	It's on your PLSS.
	CDR	Okay.
	CMP	...
	LMP	(Laughter)
	CDR	You can ask me.
	CMP	(Laughter) Okay. The going up here is bad news.

	LMP	How do you read, Gene?
04 13 34 26	CDR	Look at that. I put it at the attitude, and it didn't even tweak it.
	CDR	Jack, if we have to abort, it's VERB 21 NOUN 46 ENTER ENTER.
	LMP	Right. Let's don't do that though.
	CDR	Yes. Let's not.
	CDR	Okay. I think I'll get a sip of water.
	LMP	That's a good idea. I think I'll do that, too.
	LMP	I - glad you thought of that.
	LMP	Camera is set.
	LMP	You need any more?
	CDR	No. Why don't you jab me with a little LCG though.
	LMP	Okay. Before we go down.
	CDR	Man, that'll hold you down.
	LMP	Yes.
04 13 36 50	CDR	Holy Smoley. Man! I think they - they're ready to hold a 20-pound moose down with that.
	CDR	Want to check it?
	LMP	Okay. Now, down.
	CDR	Okay.
	CDR	You cold enough?
	CMP	(Chuckle) yes.
	CDR	So am I.
	LMP	We didn't tell them about those leak checks.

CDR About what?

LMP About that - barely passing the reg checks or the integrity check - We can talk to them about it later, I guess.

CDR Roger. (Laughter)

LMP Who knows. Just have to loosen them up.

CDR I'm not going to put it in pulse if I'm not firing any thrusters.

LMP Here, they really don't seem to be. Okay. Where do we stand? Hey, I got to get the ascent batteries on it.

CDR That going down to PDI?

LMP Yes, sir; 30 minutes to PDI. Well, shoot.

CDR Okay. You want to do some INVERTER-1 switching, too, here. Yes, and we want to do some of these things there, too.

LMP Let me see.

CDR Got to do a lot of things here.

CDR Let me give them to you.

LMP Okay. Lets go.

CDR Helmet and gloves on. CABIN REPRESS, CLOSE.

LMP Okay. REPRESS is CLOSE. Oh - the valve.

CDR CABIN REPRESS, CLOSE.

LMP Okay. It's closed.

CDR Okay. SUIT GAS DIVERTER, EGRESS.

LMP It's EGRESS.

CDR CABIN GAS RETURN, EGRESS.

04 13 39 52	LMP	RETURN is EGRESS.
	CDR	PRESSURE REGs A and B, EGRESS.
	LMP	Okay. Going to EGRESS.
	CDR	Okay.
	LMP	They're both EGRESS.
	CDR	Okay. Pre - PDI switch setting. VHF ANTENNA, FORWARD.
	LMP	FORWARD.
	CDR	Okay. My INVERTER is breakers CLOSE. Select INVERTER number 1.
	LMP	Okay. Mine's closed. INVERTER 1.
	CDR	Okay. On 11, STAB/CONTROL, AELD is CLOSED. On 11, STAB/CONTROL, ABORT STAGE, is CLOSED. Reset ENGINE STOP button. Your STOP button reset?
	LMP	It's reset.
04 13 40 49	CDR	Okay. And the lights out. Set the window bars.
	CDR	Okay. On 16, STAB/CONTROL, AELD, CLOSED.
	LMP	AELD is CLOSED.
	CDR	On 16, ABORT STAGE, CLOSED.
	LMP	It's closed.
	CDR	Cycle CWEA and get BATs 5 and 6 NORMAL FEED, ON.
	LMP	They're on.
	CDR	What time were they on?
	LMP	They were on 30 minutes. Make it 31 minutes, before.
	CDR	Okay. So that's 2 minutes ago. That's 19, - 112:19.
	LMP	That's late. They're going to be mad at me.

	LMP	Cycle CWEA, you said?
	CDR	Cycle CWEA.
	LMP	Okay.
	CDR	Okay. Why don't you pick it up here.
04 13 41 25	LMP	THROTTLE CONTROL, AUTO.
	CDR	AUTO.
	LMP	TTCA THROTTLE, MIN.
	CDR	Okay. That's a good point.
	LMP	And LMP's going to soft stop.
	CDR	THROTTLE, MIN.
	LMP	RATE SCALE, 25 DEGREES PER SECOND.
	CDR	25.
	LMP	ATT/TRANSLATION, 4 JETs.
	CDR	Four jets.
	LMP	Okay. Let's look at the DPS, the APS and all that - those things. Check your switch guards.
	CDR	Okay. I'm happy with them.
	LMP	Pressure has gone up a little. That's good.
04 13 41 53	LMP	DESCENT flow tanks - ASCENT is 150 and 115.3110, 3130 -
	LMP	Okay. It's back to SUPERCRIT. RCS. Looks beautiful.
	CDR	Okay. ECS and EPS.
	LMP	Okay. I've done that once; we'll do it again. ASCENT looks good. ASCENT 1 is lower than ASCENT 2. We'll keep an eye on that one. Okay; ECS. We've

		got that? Pressures are good. Glycol looks good. Temperatures are okay. ED BATs are good, Geno.
	CDR	Okay, ED BATs good, and everything else good on EPS.
	LMP	Yes, except the ascent batteries are a little cold, probably.
	CDR	Okay, let's pick up - -
04 13 43 59	LMP	I wonder if I ought to go ahead and put - take some descent batteries - -
	CDR	No leave them on. You're only - you're only 3 or 4 minutes late.
	LMP	Yes. They wanted it earlier, though.
	CDR	Yes.
	LMP	That's why I had that note.
	CDR	Okay. Let's go over to DPS card.
	LMP	Okay.
	LMP	DPS burn - Circuit breaker DECA GIMBAL AC, CLOSED. Okay. DECA GIMBAL, AC, is CLOSED. Circuit breaker - my DISPLAYS and OVERRIDE LOGIC breaker is CLOSED. All STAB/CONTROL CLOSED except AEA.
	CDR	All are closed except AEA.
	LMP	And check your LOGIC POWER.
	CDR	LOGIC POWER breaker is IN.
04 13 44 42	LMP	All of mine are closed. LOGIC POWER is CLOSED. RATE SCALE 25 DEGREES PER SECOND.
	CDR	25.
	LMP	THROTTLE CONTROL, MANUAL/COMMANDER.
	CDR	It's AUTO/COM - -

	LMP	AUTO/COMMANDER. (Laughter) I read that wrong every time. ATT/TRANSLATION, 4 JETs.
	CDR	4 JETs.
	LMP	BALANCE COUPLE, ON.
	CDR	It's on.
	LMP	ENGINE GIMBAL, ENABLED.
	CDR	ENGINE GIMBAL is ENABLE.
	LMP	DESCENT ENGINE COMMAND OVERRIDE, OFF.
	CDR	It's off.
	LMP	ABORT/ABORT STAGE, reset.
	CDR	Okay. They're both - -
	LMP	Look good.
	CDR	- - reset.
	LMP	DEAD BAND, MIN.
04 13 45 13	CDR	DEAD BAND is MIN.
	LMP	ATT CONTROL 3 to MODE CONTROL.
	CDR	Their MODE.
	LMP	MODE CONTROL PGNS, AUTO AND AGS, AUTO. You'll get that later.
	CDR	I'll get them when we go into 63.
	LMP	STOP push buttons are reset.
	CDR	They are reset.
	LMP	TTCA THROTTLE, MIN, and LMP is soft stop.
	CDR	Okay.
	LMP	We're standing by for the rest of the checklist there.

	CDR	We come around the horn we will both go VOX and you can pick up - - Okay. There it is. Zero plus 0.1 and plus 0.1 and 7.0. Okay.
04 13 45 58	CDR	Can you get that? I can't reach around there to -
	CDR	Okay, babe. Let's go do it.
	LMP	You want to look at the rules?
	CDR	Yes, let's talk them over.
	CDR	I'd like to do it anyway. (Laughter) ... rules or no rules.
	CDR	Let's have some radar, that's what I want to have. Everything else can be beautiful and that radar isn't - may not make a very nice day out of it. Boy, we're subsolar, now.
	LMP	Okay. Require - AUTO, ULLAGE or AUTO, ON.
	CDR	Okay.
	LMP	If you don't have either one, we got to go to - my emergency card. After PDI.
	CDR	After we start.
	LMP	One or the other.
04 13 46 39	CDR	PDI plus 31 seconds. That's the max burn time for number 2 opportunity. And a max time without full throttle.
	CDR	Thirty-one seconds.
	LMP	Thirty-one seconds.
	LMP	Landing radar goes - if you're accepted and converged by 64, you're GO. If it's accepted and converged in 63; lost but regained in 64, you're GO. And if it's accepted and converging and does converge in 64, you're GO.
	CDR	Okay.

	LMP	Okay. Now, if it doesn't - if it's not accepted by the LGC, then max DELTA-H is 1500 feet. That's between the PGNS and the radar.
	CDR	Okay.
	LMP	No land - no radar aborts.
	CMP	...
04 13 47 30	CDR	Go ahead. Go ahead, Ron.
	CMP	Okay. A cross-check with Houston prior to PDI, and we're not going to bother you unless you want to say something. Looking for you - not going to say anything unless I call you.
	CDR	Sounds good.
	LMP	Okay, Gene.
	CDR	Okay.
	LMP	We're GO to 10,000 feet if they don't give us a radial 69 - 369. We're going to 6,000 feet if we get the 369, if there is no radar.
	CDR	Okay.
	LMP	If there are no PGNS, we abort after high gate - unless after high gate.
	CDR	Yes, unless after high gate.
	LMP	Thrust - you're NO GO if the GTC is not decreased to 57 percent by P64 plus 15 seconds.
	CDR	Okay.
04 13 48 27	LMP	That's NOUN 92. Bingo propellant, 1 minute 31 seconds after low-level. Our lowest pr - propellant quantity equals 2 percent.
	LMP	And there's some silly thing about radar flashing lights here.
	CDR	Okay.

04 13 48 45	LMP	Flashing landing - radar altitude or velocity lights preceded by a steady landing radar light with altitude lockon below 35K, you cycle the circuit breaker.
	CDR	And I don't fully understand that one. Never have.
04 13 49 22	LMP	Boy! I tell you. These books aren't going to stay here.
	CDR	Do you want to help me out with this, Jack?
	LMP	Oh, I'm sorry.
	CDR	Okay, I got the hack. Wait a minute. There we go. Got her. Okay. Happy with all your ECS behind you?
	LMP	Yes, sir.
	CDR	Circuit it again. We're CLOSED on RAD, EGRESS, EGRESS.
	LMP	EGRESS, EGRESS.
	CDR	AUTO. We're all set.
	CDR	Can you get into the - -
	LMP	Yes.
	CDR	Can you get into there? Put those in there. We'll get them if we need them.
	CDR	Okay. When we come up, I want to be S-BAND ANTENNA to FORWARD.
04 13 51 19	LMP	It's there. Minus 33, plus 54.
	LMP	Okay. We're ready. Where do you want that, on SUPERCRIT?
	CDR	Yes, Jack.
	LMP	I'm getting just a little glare off of there, but I think it'll be all right.

	CDR	Well, it'll change as this window changes here. Come on Challenger, do your job.
04 13 52 31	LMP	Okay, 32; 3 more minutes. I'll be in up in DATA.
	LMP	Got a little bit of an X-axis accelerometer but very slight. Changing very slowly.
	LMP	All of my accelerometers are changing.
	CDR	Really.
04 13 53 31	CDR	Okay, Houston, what we've really got ... smooth coming around.
	LMP	Say again.
	CDR	I say, AOS on down is where we really got to be with them.
	LMP	Yes.
	CDR	You know, we're starting right in plane according to the AGS. No out-of-plane velocity.
	LMP	Let's make sure we get them before we go VOX.
	CDR	So it doesn't screw it up.
	LMP	Yes.
	CDR	Okay, I'm watching.
	LMP	Have at her.
	CDR	That's going to it, babe.
	LMP	I don't want to have to touch a thing. (Laughter) Just tell me where we are. Yes, sir.
	CDR	Do you want this, Jack?
	LMP	Well, yes; maybe I better.
	CDR	You're writing NOUN 69 or something down?
	LMP	Yes.

	CDR	You need a piece of Velcro right there. That'll be all right.
	LMP	Okay. We're there. Going to high gain.
	CDR	We got AOS?
	LMP	Yes.
04 13 55 46	LMP	There it is.

PDI PREPARATION TO POSTTOUCHDOWN

04 13 55 52	LMP	Okay, Houston. This is Challenger. How do you read? We're HIGH GAIN and DATA.
04 13 56 13	LMP	Hello, Houston; how do you read Challenger?
	CDR	Do you have an earthrise?
	LMP	Yes.
	CDR	Oh, whee! That's pretty.
	CDR	How's the high gain?
	LMP	We just lost it. Along with omni.
	CDR	Let's get that high gain as soon as we can.
	LMP	It's their problem, I think.
04 13 57 08	LMP	Hello, Houston. How do you read Challenger on an omni right now?
	CC	Okay, Challenger, you're loud and clear on the omni. How did it go?
	LMP	Okay. The burn was GO. We;re in a 7-mile perigee on the PGNS, and we had 0, plus 0.1, and plus 0.1 residuals.
	CC	Okay, sounds good.
	LMP	Ok - okay, Gordy, I'm going to try the high gain. I had you locked up once, and then I lost you. Let me try it again.
	CC	..., Jack.
	LMP	I'm sorry, Geno.
	CDR	I didn't know they were coming up that quick either. They should have said something.
	LMP	Okay. There's the omni back. Okay, Gordy, that's my fault. I didn't know you were up-linking. You've got the omni, and I'll leave it.

04 13 58 07	CC	Okay, we'll stay on the omni for the up-link.
	CDR	He should have given me a call. I didn't know they were up-linking that quick. They never have in the past. Okay. You need your ... and ED bat report?
	LMP	Yes.
	CDR	You can give that to him now.
	LMP	Yes. Okay, Gordy, ED BATs are 37.2, both batteries. The ascent battery on time was 112:19:00, about 4 minutes late.
	CC	Okay, Jack. Copy.
	CC	Jack, we want BATTERY 3, OFF, for preconditioning.
	LMP	Roger.
	CDR	And we're getting back down among them, Gordy.
	CC	Challenger, we'd like you to verify that the DEMAND REGS ... in EGRESS.
	LMP	Yes, they're in EGRESS.
	LMP	That's verified.
	LMP	And do you have a 231 update?
	CC	Stand by. There's no change, Jack.
	LMP	Roger.
	CDR	Okay, Gordo, how do you read CDR on VOX?
	CC	CDR, you're loud and clear on VOX.
	LMP	Okay. *** read the LMP on VOX?
	CDR	Okay. *** up until this time, the bird has looked beautiful - *** clean. All the check's have come out just as advertised.

04 14 00 48	LMP	And we're looking at 9 minutes and 5 seconds from PDI.
	CDR	... get all these.
	LMP	Yes, I got it.
	LMP	Okay, it's there, and I will ENTER.
	LMP	Okay, it took; and I'm showing POO.
04 14 01 20	LMP	Okay, we've got a tone on the UPVOICE BACKUP.
	CDR	***7 coming at you, Jack. Hit it.
	LMP	Got it.
	CDR	*** zero - -
	LMP	Wait, 231, *** 69, *** 0 that's supposed to be.
	CDR	56900; set 240 to the same; 56 *** 00.
	LMP	Okay.
	CDR	Okay, 254 is plus *** 944. Okay, 262 is minus 00143. Okay; 400 plus 3. Watch it. Look.
	LMP	It's had that all the way along - a little bit of roll bias, there.
	CDR	Okay. That's good. *** plus 1.
	LMP	*** plus 1 is in.
	CDR	Okay, and we do have your needle. *** your needle.
	LMP	Okay.
	CDR	Okay, and there's VERB 83 looking at you. Our CROSSPOINTERS are LOW MULT for you. Okay, and there's VERB 83. Give me a 317 and a 440.
	CDR	*** with this, Jack? Let me see 440.
	LMP	I want to get 63. Yes. Go ahead.

	CDR	Okay.
	LMP	That's good.
	CDR	Gordy, understand no NOUN 68 prior to P63 or NOUN 69, right?
	LMP	Okay. You need to ask him anything? I'll try to high gain.
	CDR	Go ahead; try it.
	LMP	Try the high gain, Gordy.
	LMP	Okay, it's locked up in AUTO.
	LMP	Gordy, be advised that you're clipping on your first word.
	LMP	That's 410, 410 not 400. *** again.
04 14 04 27	LMP	*** you, Gordy.
	CDR	Better go back and check 400 now.
	LMP	Okay. I did - I fixed it.
	CDR	Oh, man, are we down among them, babe! Whooh! ...
	LMP	Okay. Say the seconds again on the PDI.
	LMP	Okay. And the cross range?
	LMP	***, Gordy. That clock checks with - with our time out of P63.
04 14 05 38	LMP	The LANDING RADAR breaker's IN, I've got altitude, velocity, ***er. We're coming up on 4 minutes. *** for final trim at 4.
	LMP	Okay.
	CDR	Thank you, Gordy. *** GO up here for PDI; doing the final trim at 4.
	CDR	Hello, America. Do you read Challenger? Jack, you can [redacted] watch.

	LMP	Okay.
	CDR	At 2 minutes, I'll get the MASTER ARM.
	LMP	All right.
	CDR	*** seconds, *** the ENGINE ARM; and we'll watch the PGNS tapemeter pick up average g. *** a GO on the ullage, I'll back up the ullage.
	LMP	Okay.
04 14 06 52	CDR	*** back up the START.
	CDR	*** the PRO.
	CDR	*** forward omni.
	LMP	*** a little bit.
04 14 07 15	CDR	Okay, 02:41.
	CDR	Okay, we picked it all up. *** still good.
	LMP	Okay. Coming up on 2 minutes; I'm changing over here.
	CDR	Okay.
04 14 07 54	LMP	MASTER ARM, ON - 2 minutes.
	CDR	Okay, Houston; 2 minutes. MASTER ARM is ON. I've got two good lights.
04 14 08 01	LMP	*** SELECT is PGNS.
	CDR	*** again, in average g, I'll get the ENGINE ARM. *** firm the ullage, get the PRO. I'll back up the ullage and get the START.
	LMP	Roger.
	CDR	AUTO, AUTO, MIN.
	LMP	*** should have put that on like we talked about.
	CDR	*** I tell you, *** getting close.

	LMP	*** out your window is really strange. (Laughter) *** over here.
04 14 08 56	CDR	One minute, Houston, and we're standing by. We're GO for PDI.
04 14 09 19	LMP	*** approaching 30 seconds. Blank DSKY.
	CDR	DSKY blank?
	LMP	***age g. *** lights.
04 14 09 30	CDR	Okay, ENGINE ARM is DESCENT. I think the tapemeter drove. I'm not sure.
	LMP	*** the ullage. Standing by for ullage. *** seconds. *** ullage. We've got ullage. PROCEED on the 99. It took. 2, 1, 0 -
04 14 09 56	LMP	IGNITION.
	CDR	IGNITION, Houston. Attitude looks good, ENGINE OVERRIDE is ON, MASTER ARM is OFF. We got a DESCENT QUANTITY light ON at ignition - -
	LMP	D - -
	CDR	- - just prior to ignition.
	LMP	DP SHe tank's good. *** CS is good at 15 seconds.
	LMP	*** CS is golden. *** stable throttle up. *** by ...
	CDR	..., Houston. And the computer likes it.
	CDR	*** got the QUANTITY light ON. Attitude looks good, Jack.
	LMP	Okay. At 30 seconds. *** have about 108.
	CDR	Oh, boy.
	LMP	AGS and PGNS are CLOSED.
	CDR	Okay, coming up on 1 minute.

	LMP	One minute, you ought to have 98.
	CDR	Okay, H-dot is high right now.
04 14 10 57	LMP	MARK it, 1 minute.
	CDR	Altitude's high.
	LMP	Boy, it looks good, Houston.
	CC	...
	LMP	*** looking at it.
04 14 11 17	CDR	3400; I confirm.
	LMP	GO for ENTER, 01:30. We're GO coming through 57K. Okay, the altitude's high and the H-dot is high. It'll be - that's right.
	LMP	*** At 1 - 2 minutes, you ought to have 89 on the ball. We're still 30 feet per second high in H-dot. *** we're about 8000 feet high - 7000 - -
	CDR	Okay, Houston. Coming up on 2 minutes.
04 14 12 01	LMP	It's OFF. *** back ON. *** light is out.
	LMP	Houston, we - -
	CC	... good.
	LMP	Okay, we have ENGINE THRUST and COMMANDED THRUST, full scale high.
	LMP	That looks good.
	CDR	Okay, babe, let's check them at 02:30.
	LMP	RCS looks good.
04 14 12 27	CDR	*** Okay, I'm about 89 degrees - -
	LMP	Cabin looks great - -
	CDR	- - coming through 51 5.

LMP 89 is great. *** catching up - *** altitude. We should start dropping H-dot here a little bit. *** and PNGS are together. *** has us a little bit out of plane. And we're north - has us north of track.

LMP *** coming up on 3 minutes, we're GO and we're out of 49K.

CC ...

CDR Roger. Understand we're GO.

LMP Okay. At 3 minutes. 82's your ball number. *** still looking for the right altitude. So H-dot is high.

CDR Okay. *** reckoning comes at 4 minutes, Jack. *** weight's building up, looking good. Attitudes are good.

LMP Okay, at 03:30, you ought to have 79.

CDR Okay, it's right on.

LMP We're still a little high - about ***500 feet. H-dot is still high. The tapemeter moves in spurts and jerks, both on ALTITUDE and ALTITUDE RATE.

CDR Yes.

CDR Four minutes.

LMP Yes. ED BATs are 37.2.

LMP ED BATs are 3 - -

CDR Okay.

LMP Okay, Gordo, yaw's coming at 340.

LMP And the radar lights are out. Beautiful.

LMP *** looking at DELTA-H.

LMP Okay. You're looking at DELTA-H.

04 14 14 34	LMP	Okay, VERB 57 is in. Houston, is the AGS out of plane correct?
	CDR	Okay, coming up on 5 minutes, Jack. Let's take a check at it. *** 74 degrees.
	LMP	That's good.
	CDR	70 feet per second; we're coming down 36 - you're still about 2000 feet high.
	CDR	Okay, Houston, we're now out of 30 - -
	CDR	Okay. GO at 5. We're out of 36 5 now. We've got the Earth right out the front window.
	CC	Challenger, Houston. BATTERY 3, ON, at your convenience.
04 14 15 23	LMP	*** 3 is ON.
	CDR	*** 30, Gordo. We're GO. We're out of 34K.
	LMP	73, *** 4. We're right on altitude. The H-dot ought to start dropping off.
	CDR	*** we want to keep it high. *** allowed two quick looks out the window, one now and one when we pitch over.
	LMP	I can't see a thing except the Earth.
	CDR	That's what I'm telling you to look at.
	LMP	(Laughter) Oh, there's the old Earth.
	CDR	Okay, Houston, coming up on 6 minutes.
	LMP	Six minutes, you ought to have 72 on your ball.
04 14 15 58	CDR	***2 is GO.
	LMP	***1. Altitude's great. H-dot's great. *** and PNGS are very close, couple feet per second difference.
	CDR	Okay.

04 14 16 10	LMP	Houston. We went over the hump. DELTA-H just jumped.
	LMP	Looks like it's back down.
	LMP	***30, Geno. It looks good, babe. ***2; altitude is right on. H-dot is very close.
	CDR	Okay, 30K, YAW to zero.
	LMP	*** plus 26.
	CDR	Okay, we got everything - we're YAW at zero.
04 14 16 56	LMP	At 7 minutes, ***7's your angle, 26 - ***7; that's great, 106 - H-dot's slightly high, but okay.
	CC	... at 7.
	CDR	Okay, Gordo. We're GO at 7, we're now at 25,000 feet. We're quite a bit out of the command module plane, but I guess we're on target. Watch the throttle, now. Here it comes.
	LMP/CDR	*** down -
04 14 17 22	LMP	- at 27; computer likes it. Beautiful.
04 14 17 29	CDR	07:30, ***3. Okay, 01:45 to pitchover, Jack.
04 14 17 34	LMP	Okay, 63's your angle, *** 56 now.
	CDR	Okay, that's getting closer.
	LMP	H-dot and H are great. *** by for the camera.
	CDR	19K, Houston. We're GO coming up on 8.
04 14 17 55	LMP	Okay. The old camera's on, Gordy. Believe it or not.
	LMP	*** 2, ***7. That's good.
	CDR	Come on, baby.
04 14 18 13	LMP	Okay, at 08:30, Geno.

04 14 18 17	CDR	Okay, I got the South Massif.
04 14 18 21	LMP	Okay, update the AGS, Houston? ...
04 14 18 35	CDR	***, Gordo, I've got Nansen; I've got Lara; and I've got the Scarp. Oh, man, we're level with the top of the massifs, now.
	CDR	Okay, 151 - 1510 ENTER. Okay, Jack, pitchover is at 24; 24 is pitchover.
04 14 18 58	LMP	Okay, Gordo, we're out of 11,000 at 9. Okay, stand by for pitchover. Oh, are we coming in. Baby.
	LMP	... through 9000.
04 14 19 12	CDR	Stand by for pitchover, Jack.
04 14 19 14	LMP	8000.
	CDR	I'll need the PRO.
	LMP	I'll give it to you.
04 14 19 18	CDR	Pitchover.
	LMP	There it is! PROCEEDed.
04 14 19 21	CDR	And there it is, Houston. There's Camelot! Wow! Right on target.
	LMP	I see it.
	CDR	We got them all.
04 14 19 26	LMP	Forty-two degrees, 37 degrees through 5500, ***8 degrees, *** thousand feet, *** 42 degrees through 4000, 47 now; ***7 degrees through 3500; ***9 degrees; *** thousand feet, ***3 degrees.
04 14 19 54	CDR	Okay, I've got Barjea; I've got Poppy; I've got the triangle.
04 14 19 59	LMP	At 2500 feet, 52 degrees. *** dot is good. At 2000, H-dot is good. Fuel is good. 1500 feet, ***4 degrees, Gene. Approaching 1000, approaching

		1000 feet, 57 degrees. *** through 1000, and I'm checking - radar altitude and PGNS altitudes agree. *** through 800 feet. *** dot's a little high.
	CDR	Hey, I don't need the numbers anymore.
04 14 20 32	LMP	Okay, you're 31 feet per second, going down through 500; *** feet per second through 400. That's a little high, Geno.
	CDR	Okay.
04 14 20 42	LMP	*** hundred feet, 15 feet per second. *** high. H-dot's a little high.
04 14 20 51	CDR	Okay. I've got P66.
04 14 20 55	LMP	Okay; 9 feet per second, down at 200. *** down at 5. *** down at 5. *** down at 10. Cut the H-dot. *** fuel's good. ***10 feet. Stand by for some dust. Little forward, Gene.
	CDR	...
04 14 21 15	LMP	Move her forward a little. 90 feet. *** forward velocity. *** feet, going down at 3. *** little dust. *** 4 - 60 feet, *** down about 2. Very little dust. *** little dust, *** feet, going down at 3.
04 14 21 42	CDR	*** for touchdown.
04 14 21 43	LMP	Stand by. ***5 feet, down at 2. *** good. *** feet. *** down at 2. 10 feet. *** feet -
04 14 21 58	LMP	CONTACT.
04 14 22 03	LMP	*** push. Engine stop; ENGINE ARM; PROCEED; COMMAND OVERRIDE, OFF; *** CONTROL, ATT HOLD; PGNS, AUTO.
04 14 22 11	CDR	Okay, Houston. The Challenger has landed!
	LMP	Okay, Parker valves -
	CDR	Boy, you bet it is, Gordo. *** you said shut down; I shut down and we dropped, didn't we?

	LMP	Yes, sir. But we is here; man, is we here. How does that look?
	CDR	That looks good.
04 14 22 35	LMP	Pressure - pressures look great. *** 2 is down just a little from before.
04 14 22 40	CDR	The ENGINE OVERRIDE is OFF ... - -
04 14 22 41	LMP	Manifold is great. Manifold is right on. Get - go to JETS.
04 14 22 44	CDR	Okay. I am JETS.
	LMP	Okay. That side's complete. Houston, you can tell America that Challenger is at Taurus-Littrow.
	CDR	***, I had the meatball all the way. Jack, are we going to have some nice boulders in this area.
04 14 23 08	LMP	Okay. The old camera's off.
	CDR	Okay.
04 14 23 12	LMP	*** RADAR breaker, OPEN. *** water. Gordy, ascent tank 1, we started out a little low. It's still - same place. *** water.
04 14 23 28	LMP	***ries look good.
	CDR	Oh, man! Look at that rock out there.
	LMP	Absolutely incredible. Absolutely incredible.
	CDR	I think I can see the rim of Camelot. *** moment of my life.
	LMP	Where'd you land? *** let me look outside at all. You can see the boulder tracks.
04 14 23 58	CDR	Okay, Gordy. We're standing by for your GO. We look good. We're looking good on board.
	LMP	*** are boulders all over those massifs. Gosh, look at that propellant. We could have gone all around and looked around.

CDR We should have hovered around a little bit; gone and looked at the Scarp.

LMP No, thank you.

CDR (Laughter)

LMP I like it right where we are.

CDR Okay, Gordy. While you're - while you're waiting on that GO, I had to - I - I shot for a spot around 2 o'clock from Poppy. There's a number of boulders out at 12 o'clock from Poppy, and I really think I'm probably not more than about 100 meters out in front of it - and slightly to the north. Actually, I may be a little bit closer to Trident than I expected Poppy to be. I - I think I've got Trident right out the left window. *** our first cut at the mobility around here in the Rover. It ought to be super.

LMP I tell you, the massifs and Bare Mountain are two different products.

CDR *** it, don't they?

LMP Of course, they're different slopes, too.

CDR I think you're looking - probably - that may be Rudolph, right there, Jack, out your window. *** looking more at those boulders and trying to stay in the spots in between them than I was - -

LMP Yes, you did great, Gene.

CDR - - relationship to that crater. Man, there was practically no dust, just a little bit of a film; you had the ground, all the way to the ground.

LMP Yes. *** call touchdown on the shadow. Look at that. *** here.

04 14 25 44 CDR (Laughter) Okay, Gordy. We're hanging in for your GO.

LMP It better be a GO. I'll check everything again. Let's just doublecheck.

	CDR	Okay.
	LMP	That hasn't changed.
	CDR	Okay, that's good.
04 14 25 55	LMP	Those - the manifold hasn't changed. ***CS hasn't changed. ***cent water hasn't changed. The batteries haven't changed.
	CDR	Oh, my golly.
	LMP	Only we have changed.
	CDR	*** you can't see into Camelot, Jack; that rim is - is Camelot out in front of us.
	LMP	Yes, I - -
	CDR	We got enough room to deploy three ALSEPs out there.
	CDR	Gordy, you're a smooth talker, you know it?
	LMP	Very good.
04 14 26 25	CDR	We are STAY for T-1.
	LMP	Okay. You can forget all I told you about VERB 22 NOUN 46.
	CDR	What was that? (Laughter)
04 14 26 37	LMP	Okay. Let's find out where we are. *** stop is reset.
04 14 26 42	CDR	Okay. The AGS is ready for us if we need it.
	LMP	Okay. I need a P12 time as soon as I get 60 - -
	CDR	Okay.
04 14 27 02	CDR	Okay, Gordy. You're looking at NOUN 43. *** that down, Jack, right here.
	LMP	*** 21 and - -

04 14 27 09	CC	Okay. We've got it.
04 14 27 11	LMP	- - 20 21 and 30 75, and I'm going to P12. Okay. I need a P12 time for you.
	CDR	Okay.
	LMP	For T-2.
	CDR	For T-2, the time is 113 - -
	LMP	Okay.
	CDR	14 - -
	LMP	14.
	CDR	***4.91.
	LMP	***.91.
	CDR	***, sir.
	LMP	I can't feel any difference between 1/6g and anything else right now.
	CDR	Well, you still got your restraints on. (Laughter) Okay. ***13:14:24.91. You happy with that?
	LMP	That looks good, sir.
	CDR	Okay.
	LMP	*** change these numbers. *** an update on NOUN 76, did you? *** think so.
	CDR	No. No.
	LMP	Okay.
	CDR	No. Okay; 5515. Gordy, how would you like me to handle R-3 of NOUN 76?
04 14 28 28	CDR	Okay. *** radar performed super.
	LMP	How was the view on the way down, Gene? (Laughter)

	CDR	You know, after we pitched over, I was just looking for a place to land. I'm not sure. *** didn't want to hit one of those boulders out there which would have been as easy - and look at that. Look at right in front of us. *** want to land there either.
	LMP	I see that one right in front of us.
	CDR	You see that? *** the boulder, the hole.
	LMP	Oh, the hole. I can't see the hole - -
04 14 28 58	CC	Challenger, Houston. ...
	LMP	Okay. Okay. We're coming up - -
04 14 29 11	CDR	We're in posture for a T-2, Gordy.
	CDR	Okay. I can see the Scarp. *** see Hanover. *** we didn't plan to go to Hanover. (Laughter) It's steep.
	LMP	*** the boulder - halfway up the hill.
	CDR	Yes.
	LMP	Not halfway, just enough - -
	CDR	Yes, the boulder tracks - they're beautiful.
	LMP	It's sitting right there in the end of the track. There are tracks all over that hillside. There's a boulder came right down to the surface there. See it?
	CDR	Yes.
	LMP	That one right through that little crater - -
	CDR	Yes.
	LMP	- - sitting right there for us to sample.
	CDR	***, sir. I'll bet Bare Mountain and the Sculptured Hills are the same.

LMP Yes. They - Well, the slope's different. We'll have to look at it from outside. You may be right. Now I see why they call them sculptured. They're so hummocky that there's shadow all over them.

CDR Yes.

LMP *** there are some holes and rocks around here. Who told me this was a flat landing site?

CDR It is flat. For crying out loud. What do you want, airtight guarantee?

04 14 30 14 LMP *** we got about 2 degrees left and about 5 degrees pitchup.

CDR We're about what - about 100 meters from Trident?

LMP Yes - yes, less than that.

CDR I think Trident's right here.

LMP Our shadow's about 100 feet, Geno, I think.

CDR Yes, we're only about - yes, less than 100 meters then. *** look that long, but it's supposed to be.

LMP Yes, there are some holes I'm glad I didn't land in around here, I'll tell you.

CDR Now, if you look at the massifs, Jack. I don't know if you can see it over here. See, they're almost like a series of linear boulder tracks, but they come crossways down the slope. *** looks like there may very definitely be some - *** there's outcrop on top the massif, too.

LMP Oh, it sure looks like it, gray outcrop.

CDR And, there's a - -

LMP - - a bluish gray compared to the - the *** or tan gray of the massif side.

CDR And a lot of that boulder is - a lot of that outcrop down on the bottom is boulder.

	LMP	Yes. Do you know what that reminds me of, way up on top - that outcrop? It reminds me of sunset where you could just get a little piece of outcrop around the corner.
	CDR	That's right.
	CDR	Okay. I just looked at them.
	LMP	Okay. Ascent looks good.
04 14 31 36	CDR	*** I noticed something ever since we've landed. The oxidizer quantity went from - from *** or 8, and now it's down to 2, and the fuel has stayed constant.
	CDR	*** QUANTITY light came on somewhere, I believe, after we landed.
	LMP	*** did. I noticed the QUANTITY light also. I was thinking *** light, though, when I saw it. *** man.
	CDR	Okay. It doesn't make any difference now, Gordy, *** to talk about when we get home.
04 14 32 27	CDR	And we're 2 minutes and counting to T-2.
	LMP	*** hurry if - *** give - they're going to give us the GO.
	CDR	Wait a minute.
	LMP	*** some water?
	CDR	*** you can zap me. I tell you. *** thing everyone's got to do once in their life.
	LMP	I want to - *** to have much time for T-2, Gordy, do you read?
	LMP	Okay.
	CDR	Okay. Understand. STAY for T-2, and GO for the DPS vent. Let me get out of - Okay, we can't hack that. I'm going to get out at 12.

	LMP	***, Gene.
04 14 33 46	CDR	Okay. You can unzap that water, if you'd like. And let's go off VOX. Let's go on PTT. TAPE RECORDER, OFF.

EVA-1 FINAL PREPARATION

04 17 44 45	CDR	- - on VHF ANTENNA, EVA.
	LMP	EVA.
	CDR	UPLINK SQUELCH, ENABLE.
	LMP	Wait a minute.
04 17 44 55	CDR	Did you get that?
	LMP	Yes.
	CDR	UPLINK SQUELCH, ENABLE. Okay.
	LMP	Stand by. Wait a minute. UPLINK SQUELCH, ENABLE. All right. It's ENABLED.
	CDR	RECORDER, ON; VHF ANTENNA, EVA; and UPLINK SQUELCH - -
	LMP	Yes, got it.
	CDR	Okay. Stand by right where you are.
	LMP	Okay.
04 17 45 13	CDR	Okay. I've got to go S-BAND, T/R; ICS, T/R; RELAY is OFF. MODE is *** - I'm in VOX; SENSITIVITY is max; *** is *** R, and B is RECEIVE. Okay. You can open your breaker and connect to the PLSS comm. ***, I guess you heard that.
	CDR	Okay. PLSS MODE A. Okay; tone ON; VENT flag, P.
04 17 47 20	LMP	*** weak tone and a VENT flag, P.
	CDR	Okay.
04 17 47 23	LMP	*** good tone right now.
	CDR	*** flag, 0; and O_2 - -

	LMP	Okay, it's in 0 and - -
	CDR	- - momentarily.
	LMP	- - O_2 *** there.
	CDR	Okay, PLSS O_2 - -
04 17 47 32	LMP	It's on.
	CDR	What's your PLSS O_2 pressure gage?
	LMP	O_2 - -
	CDR	Give Houston a call and give it to them.
04 17 47 40	LMP	I'm reading 100 percent, Houston.
	CC	Roger, Jack. And we're reading you slightly garbled but loud.
	LMP	*** you're loud and clear, Bob.
	CDR	Okay, Jack. You got that, and I'm reading you. How you reading me?
	LMP	You're loud and clear.
	CDR	Okay. We will not unstow the antenna. You are a sukosh garbled, but very readable.
	CDR	Okay. Stay where you are. I'm going to get mine. Okay. AUDIO breaker is - -
	LMP	***
	CDR	***
	LMP	***
04 17 49 37	CDR	Okay. I got a tone.
	LMP	VENT flag, P.

04 17 49 39	CDR	I got a VENT flag, P.
	LMP	*** flag and O_2, ***
04 17 49 43	CDR	PRESSURE flag, and I still got an O_2 flag.
	LMP	Off with your tone.
04 17 49 47	CDR	Okay. The tone is gone. The O_2 flag cleared.
	LMP	Okay. PLSS *** quantity.
04 17 49 53	CDR	Okay; and I'm reading 10 ***
	LMP	Okay.
04 17 49 59	CDR	Note crewman in MODE B, that's me, cannot hear Houston. Houston, broadcasting in the blind; 100 percent on the CDR.
04 17 50 06	CC	Roger, CDR. Houston reads you loud and clear.
04 17 50 13	LMP	I read you loud and clear, Gene.
	CDR	I'm reading you loud and clear.
	LMP	Okay.
	CDR	Give me a call again.
	LMP	Okay. How do you read, Gene? 1, 2, 3, 4, 5.
	CDR	Give me again.
	LMP	1, 2, 3, 4, 5.
	CDR	I think so. I can't - Okay. Yes, I'm reading you. Okay. PLSS. LMP go B.
04 17 50 32	LMP	Going B.
	CDR	*** B *** A. Okay. How do you read me, Jack?
	LMP	You're loud and clear, and I got a tone.
	CDR	Okay. Give me a short count once.

	LMP	Counting 1, 2, 3, 4, 5.
	CDR	Okay.
	LMP	You're great.
	CDR	Okay. I had a tone, too. I still got a PRESSURE and a VENT flag.
	LMP	And, Houston, how do you read the LMP?
	CC	*** LMP. We read you loud and clear.
	CDR	Okay, Bob. I'm reading you loud and clear, and he's not reading you in this mode. How me?
	CC	I read you loud and clear also, Gene.
04 17 51 19	CDR	Very, very, good. We're both going AR, now.
	LMP	Let's go.
	CDR	Ought to get a tone. I didn't, but my VENT flag did clear.
	LMP	Here it is.
	CDR	Tone and a VENT flag.
	LMP	Here's my tone and - *** flag.
	CDR	Okay, Jack. The wheel is Houston and the blade is me. Hello there, Houston. How are you reading CDR?
	CC	Read CDR loud and clear. And, for your information, your TM on the PLSSs looks good.
04 17 51 52	CDR	Okay.
	LMP	How do you read, Houston? This is the LMP.
	CC	Houston reads LMP loud and clear now. You're much clearer than you were before, Jack.
	LMP	Very good.

	CDR	Okay. Jack, we gave them our quantities already; so, SQUELCH, VHF B LMP, FULL DECREASE.
	LMP	*** B is to FULL DECREASE, huh?
	CDR	That's affirm.
04 17 52 16	LMP	Okay. It's FULL DECREASE.
	CDR	Okay. On 16, leave that PUMP breaker CLOSED.
	LMP	Okay.
	CDR	*** cold; but that's good. Okay. On 16, ECS, CABIN REPRESS, CLOSED.
	LMP	*** It's - is that a verify?
	CDR	That's a verify.
04 17 52 30	LMP	Okay. It's CLOSED.
	CDR	SUIT FAN DELTA-P, OPEN.
04 17 52 33	LMP	Okay. DELTA-P is OPEN.
	CDR	And SUIT FAN number 2, OPEN.
04 17 52 36	LMP	*** OPEN.
04 17 52 38	CDR	Okay. And I've got SUIT FAN number 2. There's a MASTER ALARM. Okay. And I heard it run down. *** I don't see a - No, there's not an ECS caution until that thing runs down - about a minute or so. *** watch for that. Okay; SUIT GAS DIVERTER, PULL-EGRESS.
04 17 52 57	LMP	Okay. DIVERTER is PULL-EGRESS.
	CDR	*** GAS RETURN, EGRESS.
04 17 53 03	LMP	TURN [sic] is EGRESS.
	CDR	SUIT CIRCUIT RELIEF, AUTO.
04 17 53 07	LMP	RELIEF is AUTO.

	CDR	Okay. OPS CONNECT. You ready?
	LMP	***
	CDR	Okay. SUIT ISOL, ACTUATOR OVERRIDE.
04 17 53 21	LMP	Okay. OVERRIDE.
	CDR	*** Disconnect your LM O_2 hoses.
04 17 53 26	LMP	Okay. LM O_2 hoses are disconnected.
	CDR	Okay. And they're stowed, right?
	LMP	Right.
	CDR	Okay. Connect OPS O_2 hose to PGA, blue to blue.
	LMP	Okay. Where is it?
	CDR	Okay. It's sticking - right - Turn around. No, that's not it - -
	LMP	No, that's the water.
	CDR	Wait a minute. Turn towards me a little bit. *** the left. *** because I got ... Okay. Here it comes - right here. OPS hose under - No, right here.
	LMP	Here it is.
	CDR	Let me get it. I'll get it - I'll get it under your electrical cable.
	LMP	Guess you're going to want a purge valve in a minute.
	CDR	That is locked in the lock lock.
	LMP	Move your arm.
	CDR	This is ... Could you do that?
	LMP	*** in a second.

	CDR	*** I can't see.
	LMP	Okay.
04 17 54 19	CDR	Okay. *** here. Okay. And I'm going to connect OPS hose to put it blue to blue, retrieve purge valve. Let me give you purge valve, and I'll pick that up, Jack. *** cockpit's just as small as the mockup. Okay. Here you are. You verify it's in LOW, LOW.
04 17 54 37	LMP	Okay. It's in LOW.
	CDR	Slip to the right just a sukosh.
	LMP	Yes; slipped it to the right just a sukosh.
	CDR	*** Man, that's easy.
	LMP	(Laughter) Whee!
04 17 54 50	CDR	Okay. *** installed. *** might be an iceberg when I get out there, but it's going to feel good.
04 17 55 03	LMP	Okay. It's in.
04 17 55 06	CDR	Okay. My PURGE valve's LOW, *** and *** in. Want some help with that? I want to take a look at it.
04 17 55 18	LMP	There's the old MASTER ALARM.
	CDR	Okay. That should be the WATER SEP.
	LMP	Yes.
	CDR	It's on.
	LMP	Yes. It's barely on.
	CDR	You're going to have to push my lock lock down.
	LMP	I'll get it.
	CDR	I don't know why, but -

	LMP	*** check mine, too. That's it. I'm going to have to check you anyway. Let me turn this way.
	CDR	Okay.
04 17 55 56	LMP	That's why; because it wasn't locked.
	CDR	Is that where you want it; facing down or in? You don't want it there, do you?
	LMP	No, I don't want it there. Must have had it in the wrong -
	CDR	Is that where you want it?
	LMP	Yes.
	CDR	Okay. It's there.
	LMP	Good.
04 17 56 14	CDR	The lock lock is down and it's verified LOW and the pin still is in. *** at mine while you're there.
04 17 56 25	LMP	Okay. It's safe and in. Lock's in and *** low. Pin's in; it's good.
	CDR	Okay. Let me get my - this *** right here. *** hose for me under my arm.
	LMP	*** under the electrical cable.
	CDR	Okay.
	LMP	I think that'll be better, isn't it?
	CDR	Okay.
	LMP	It's there and locked. Verify lock lock.
04 17 56 56	CDR	Locked.
	LMP	Okay.
	CDR	And the cover is going on.

	LMP	Look pretty good under that ...
	CDR	...
	LMP	Yes. That's right.
	CDR	Good.
	CDR	*** You're covered. Okay. *** getting to our favorite part here. (Laughter) Okay. PURGE valves are installed on both. PGA DIVERTER VALVE; put it vertical.
04 17 57 40	LMP	*** vertical.
	CDR	Okay; commander repeat - that's done. *** Let's take a drink then close the descent water.
	LMP	***
	CDR	*** is already prepared. And drink and position mikes.
	LMP	Oh, those little *** covers are next. Okay.
	CDR	Had enough water today; they could - you could say you discovered me. I'm water on the Moon. Okay. Let's turn the descent water off, and let's stow this.
04 17 58 19	LMP	Okay. WATER is going OFF. *** WATER is OFF.
	CDR	Okay. And it's ***
	CDR	*** your mike.
04 17 58 34	LMP	Okay; mikes are good.
	CDR	Top of the page. Okay. Before we turn the fans on, let's make sure we've got - all I got hooked here is the water. Those cables are all stowed. They're not in your way, are they?
	LMP	No, not in my way.

	CDR	*** good.
	LMP	*** though.
	CDR	Do you want to put - put this around them?
	LMP	Yes.
	CDR	*** probably a little bit better. *** pop out at you.
	CC	17, Houston. Over.
	CDR	*** ahead, Houston.
04 17 59 05	CC	*** still seeing the commander's SUIT DISCONNECT VALVES in CONNECT.
	LMP	How's that?
	CC	*** it goes. *** it. Thank you.
	CDR	Okay, Bob. Okay. We got to get the PLSS fan on. Don't forget that's battery power. *** don our helmets, check our drink bags, don our LEVAs, protective visors, secure our tool harness. *** umbilicals are already stowed.
04 17 59 38	CDR	*** under the handhold. Verify the following. *** where we pick up our -
04 17 59 54	LMP	*** put the helmets on, I think.
	CDR	Okay, yes. Then we pick up our gloves.
	LMP	*** reckon.
	CDR	*** there it is. Okay. *** let's *** one at a time here.
	LMP	That's mine.
	CDR	That's yours.

	CDR	Okay. Do you want to turn your fan on for circulation?
04 18 00 11	LMP	*** I guess I better. Fan's on.
	CDR	Now, pull this out just to get it out of your way?
	LMP	Okay.
	CDR	*** All your *** bars, and ***ade, and all that jazz are all clear. *** I should say.
	LMP	That sounded good.
	CDR	*** Try it. *** looks good here, Jack. Okay. Want your LEVA?
	LMP	... Okay.
	CDR	You know you're going to be in there for a few hours.
	LMP	*** think of any place I'd rather be right now.
	CDR	Sounds like you're in there, too. *** too far back. Okay, that's better. *** my you-know-what off.
	LMP	Me, too. (Laughter)
	CDR	Okay. Does that look lined up to you?
	LMP	Looks pretty good.
	CDR	Okay. Let me - Wait a minute. *** get this down around ***. That's around behind you; protected back there. That's below the ***PS hose.
	LMP	I'm hoping to get out of *** water. (Laughter)
	CDR	Okay. You're thermally - Let me doublecheck that. *** is locked. Your visor is locked. *** you don't want to lose among some others. Okay. *** You want to give me a hand?
	LMP	Not particularly. (Laughter)

04 18 02 15	CDR	***, man. Where did that come from?
	LMP	Watch your nose, drink bag, candy bars, popcorn. Click, click, ***
	CDR	*** hard back there.
	LMP	*** fan?
	CDR	***
	LMP	*** good.
	CDR	Okay. I can hear the fan running. Oh, man, whew!
04 18 03 23	CDR	Looks good here.
	LMP	Yes. That's all right.
	CDR	There you go.
	LMP	New; never been used before.
	CDR	Make sure that flap in back goes below that OPS hose.
	LMP	Yes. Want to put your protective visor down?
	CDR	Yes, if you got that thing all - you got it all done?
	LMP	Yes.
	CDR	*** with it back there?
	LMP	Yes, sir. You're nice and protected. Okay. Good Velcro.
	CDR	*** You're all covered here.
	LMP	Okay.
	CDR	*** other one, is it? No.
	LMP	No.

	CDR	Okay. Ohhh! *** we've got to get two harnesses here. Don LEVAs. Look at that scratch right in the middle of that thing. Okay. Don LEVAs and lower protective visor.
	CDR	Okay. Secure harness and self doff straps.
	LMP	*** Stay where you are.
	LMP	*** it.
	CDR	Okay. Stow LM O_2 - *** LM O_2. And comm. *** They're all stowed; everything except water, right?
	LMP	Okay. Verify the following. *** your helmet and visor.
	CDR	Okay. You check me. I'll read them. Helmet and visor, *** and locked.
04 18 05 27	LMP	Okay. *** locked.
	CDR	Okay. O_2 cover is all locked. ...
	LMP	*** locked.
	CDR	*** valve; everything down there.
	LMP	That's locked; *** locked.
	CDR	Comm carrier.
	LMP	Stand by. That's locked.
	CDR	Okay. DIVERTER VALVE is vertical.
	LMP	Comm is that way. DIVERTER VALVE is vertical.
	CDR	Okay. *** more time. Your helmet is locked, purge valve, locked. *** *** that's locked; *** locked. *** let me see - *** see. Sure and that's locked.
	LMP	*** let anything to chance.
	CDR	***

	LMP	*** DIVERTER VALVE is vertical.
	CDR	*** you check, too.
	LMP	Yes, sir.
	CDR	Okay. Verify your old white dots.
	LMP	Okay. Old white dots. *** old white dots - *** you manage to move a little?
	CDR	Yes, I'll move.
	LMP	Okay. Got it.
	CDR	*** miss Danny being out there to hand us those light PLSSs.
	LMP	That's right.
	CDR	*** want - Okay. I want the EVA decals, also, Jack.
	LMP	Yes, white dots plus decals.
	CDR	*** Okay, Bob, we're turning the page.
	CC	*** We're right with you.
04 18 07 31	CDR	Okay; don EV gloves.
	LMP	Okay. Is that it?
	CDR	That's it. Don EV gloves. Do a little grease in here.
	CDR	And make sure your wrist locks are locked. Glove straps adjusted and *** the wrist rings. ***
04 18 08 14	CDR	I sure missed hearing it click, but they are locked. One of them is, anyway. Hey, Jack. I verify - -
	LMP	(Laughter)
	CDR	What?
	LMP	Guess what? (Laughter)

	CDR	They don't go on any easier in one-sixth g, do they?
	LMP	They break just as easily, too.
	CDR	Okay, I've got my one glove locked. *** them - *** old fist covers.
	LMP	*** had that happen in training; you did.
	CDR	*** locked - that's about as locked as it can go. *** hate like the devil to have that pop open. Okay; that's very good. *** help you with one, or can you get it?
	LMP	Well, I don't know. I've only worked on one so far.
	CDR	I've got a free hand before I grease it up.
04 18 09 17	LMP	I broke that one.
	CDR	*** from the looks of that soil out there, that drill may have a job ahead of it.
	LMP	Yes, I didn't have a chance to mention that. *** regolith is very thick, and I think you've got rocks below it.
	CDR	*** that?
	LMP	*** how does it look?
	CDR	Let me take a look.
	LMP	Didn't make it, huh?
	CDR	Yes, well, let me - Hold your hand up here. Hold it up here.
	CDR	*** on my side. How is your side?
	LMP	Good over here.
	CDR	Okay. Let me pull this one out for you.
04 18 10 08	LMP	*** Thank you.

	CDR	*** old other hand.
	CDR	*** locked.
	LMP	*** other glove is locked.
	CDR	*** for the fun in back (laughter).
	CDR	Oh, me; oh, my.
	LMP	I think I got it. *** I got it.
04 18 11 37	LMP	*** let go. Isn't that the word?
	CDR	That's what they tell me. Want me to get it?
	LMP	I got mine - No, I got it.
	CDR	*** your's locked?
	LMP	Yes, sir.
	CDR	Okay. Both my gloves are verified locked. *** that grab you?
	LMP	Okay; feels good.
	CDR	Is your *** tight enough? Checklist on tight enough?
	CDR	*** best I can do; I guess.
	LMP	Okay. *** what?
04 18 12 22	CDR	Wrist rings are covered. Note if PGA biting. No, mine's all right. Your's okay?
	LMP	No; it's fine.
	CDR	Okay. LCG cold as required. We been on cold all this time, right?
	LMP	Yes.
	CDR	Okay. Guess you can open that breaker, and I'll stop shivering. (Laughter)
	LMP	Okay.

	CDR	And we can disconnect the LM water hoses. Let's help each other with those so we don't screw up the other hoses.
04 18 12 42	LMP	*** breaker's OPEN.
	CDR	Okay.
	LMP	Let me turn around this way.
	CDR	Okay. *** ahead and I'll -
	LMP	Okay. You want to get mine or you - -
	CDR	*** I'll get yours.
	LMP	Okay.
	CDR	*** First of all, I'm going to take *** off. Okay. *** let me get your other one. *** is. Okay. We did this before. Stand right there. It's locked, Jack.
04 18 13 27	LMP	Okay. It is locked.
	CDR	*** cover on. *** The cover is on.
	LMP	*** Yours off?
	CDR	*** in a second. Okay. Yours is just laying there, too.
	LMP	*** Hang on.
	CDR	Okay. I'll push towards you. *** sure that thing falls in the hole, because yours didn't right away.
	CDR	*** fall in?
	LMP	*** it's in the hole.
	CDR	*** cover on.
	LMP	Wrist cover's on.

	CDR	And my PGA is going to start biting here if we don't get going.
	LMP	Okay - okay - PLSS to the - -
	CDR	I've got to turn my oxygen on a second, Jack.
	LMP	Yes, so do I.
	LMP	*** that. *** is.
	CDR	Okay. It's on.
	CDR	A little hard to get it off, isn't it?
	LMP	Yes.
	CDR	Okay. Mine is back off.
	LMP	Yes, mine is.
	CDR	Okay. *** DIVERTER VALVE, MIN; verify.
04 18 14 56	LMP	*** Mine's MIN.
	CDR	Okay. PLSS PUMP, ***; that's to the right. PRESSURE REGs A and B, EGRESS.
	LMP	*** we're already at EGRESS.
	CDR	Pump's on.
	LMP	We're in EGRESS.
	CDR	Okay, my pump is on. I can feel it running.
	LMP	Keep talking.
	CDR	Pressure integrity check. Okay. PLSS O_2 ON. *** for this?
	LMP	I hope so.
	CDR	Okay. PLSS O_2 ON.

	LMP	Mine's on.
	CDR	*** flag and O_2 flag clear, 3.1 to 3.4.
04 18 15 38	LMP	Okay. I'm coming up. I know that.
	CDR	*** 10 minutes to 6 at home.
	LMP	Okay. Okay. I'm still coming up, coming up.
	CDR	Keep coming up. *** got mine on.
	LMP	*** okay. Well, I'm ahead of you then.
	CDR	Yes. *** The PRESS flag will clear 37 - Correction - 3.1 to 3.4.
	LMP	What do you want me to do when I'm pressurized?
	CDR	We'll want to make an integrity check.
	LMP	Yes, but then what?
	CDR	Can you - can you reach those water hoses right there?
	LMP	Yes.
	CDR	Before you get too hard?
	LMP	*** out of the way?
04 18 16 25	CDR	Okay. When you get - when you get up - *** PRESS flag cleared on the commander. *** The O_2 flag did not clear. I'm at 3 - *** - Okay. O_2 flag cleared on the commander.
	LMP	*** an O_2 on the LMP.
	CDR	Okay, you're not up yet; I suppose.
	LMP	No.

04 18 16 58	CDR	*** I'm going to take my PLSS O_2 OFF for 1 - counting 1 minute, ***7. *** when you're up, Jack, and I'll give you a minute hand.
	LMP	Okay. I'm clear.
	CDR	*** up?
	LMP	Yes.
	CDR	You can turn your PLSS O_2 off any time. Let me know when. *** it? If you can't, I'll get it for you.
	LMP	*** you get it.
	CDR	Okay. ***
04 18 17 34	CDR	MARK it.
	LMP	Okay.
	CDR	You're on the 30-second mark, and I'm on the minute mark.
	LMP	Okay, and I'm at 3.8.
	CDR	Okay. I'll give you a hack on it.
	CDR	*** coming up on 45 seconds.
04 18 18 01	CDR	*** 1 minute; going back on. Okay, Houston. Commander went from 3.8 to about 3.67. *** yours on when you need it on, Jack.
	CC	*** that, commander.
	CDR	*** And we'll pick Jack up here in about 10 more seconds.
	CC	Okay.
04 18 18 31	CDR	Okay, Jack. I'm turning on. Did you mark it?

	CDR	Okay, Houston; 3.8 to 3.6.
	LMP	***, Houston; you copy the LMP?
	CC	*** Copy the LMP.
	CDR	Okay. Standing by for your GO for depress.
	CC	Okay. And, Challenger, you'll be glad to know you are GO for depress.
	CDR	Thank you, Robert. I understand we are GO for depress.
	CC	That's affirm.
	CDR	Okay, Jack. Can you reach the *** valve, or do you want me to?
	LMP	Well, let me turn around here.
	CDR	Okay, on 16 - first around, on 16, CABIN REPRESS, OPEN.
04 18 19 16	LMP	Okay; 16: CABIN REPRESS, OPEN. *** breaker is op - coming open.
	CDR	Okay, and CABIN REPRESS valve, CLOSED, on the panel.
04 18 19 25	LMP	*** valve is closed.
	CDR	Okay. If you can't reach it, I guess I can.
	LMP	Okay. I just had a momentary tone.
	CDR	So did I. I got it, too.
	LMP	Okay.
	CDR	I think it was when you closed the REPRESS valve.
	CDR	*** reach it? If not, I'll reach your overhead one.
	LMP	I think you better reach your overhead one.

	CDR	Okay. Slip over to your right.
	LMP	*** more?
	CDR	Let me turn here. *** I got turned.
	LMP	Okay. How far down are we going to take it? *** 5, right?
	CDR	Yes, wait a minute. I'm not there yet.
	LMP	Well, I just want to make sure that I'm watching.
	CDR	Okay; now.
04 18 20 18	CDR	*** coming open. You ready? You reading the checklist?
	LMP	STANDBY, AUTO. REPRESS is CLOSED.
	CDR	***
	LMP	Okay, ...
	CDR	***
	LMP	Wait a minute, wait a minute, wait a minute.
	CDR	Okay.
	LMP	Got the wrong place. OPEN, then AUTO at 3.5. Okay; go ahead.
04 18 20 37	CDR	*** Here it comes. *** see daylight through it.
	LMP	Okay, it's coming down. Okay. That's 4 - *** by.
04 18 20 53	LMP	***. 3.5.
	CDR	Okay. It's off.
	LMP	*** And your cuff gage should not be below 4.6, and mine's at 5 - mine's at 5.0.
	CDR	One? ***

	LMP	Okay. The suit circuit is locked up at 4.5. *** 3.5 and holding.
	CDR	*** I'm decaying.
	LMP	*** I'm below 5.
	CDR	So am I.
	LMP	Verify that; okay.
04 18 21 32	LMP	Okay. I'll start my watch.
	LMP	*** started.
	CC	Okay. We verify and we're counting.
04 18 21 41	LMP	Okay. OVERHEAD or FORWARD DUMP VALVE, OPEN.
	CDR	Okay. Here it comes.
	LMP	*** it's going down.
	CDR	You going to want me to put this in AUTO afterwards or not? *** turn around, Jack.
	LMP	Stand by.
	CDR	... open - -
	LMP	Leave it open.
	CDR	No, we don't, because then we don't want that hatch to get closed.
04 18 22 09	LMP	*** turn around here. Oh, boy!
	LMP	*** you sure get heavy at 5, don't you? Okay. Where are we? *** here, huh? *** that was -
	CDR	What's cabin, Jack?
04 18 23 05	CDR	***, Jack? Wait a minute.
	CC	***, this is Houston. CDR, we're not reading the LMP either.

	CDR	Now how do you read, Jack?
	CC	We read you - -
	LMP	Okay. You're loud and clear. Okay. We got a switch in the wrong place as usual, Bob. *** just hit the *** SELECT; that's all.
	CDR	Okay. Partially open the forward hatch, when we can.
	CC	Okay. We copy.
	CDR	Okay. Can you zap over to the left as much as you can?
	LMP	To the right, you mean?
	CDR	Yes. Yes. To the north.
	LMP	To the north.
	CDR	The north.
	LMP	The north. (Laughter) *** it's about 0.2, Gene.
	CDR	*** me - -
	LMP	You going to be able to get to it?
	CDR	*** You bet you. I've come this far. I'm not going to miss getting that hatch open.
04 18 23 56	LMP	Hey, something just flew out.
04 18 23 58	CDR	Yes, it's open now.
	LMP	Gosh, look at those trajectories (laughter).
	CDR	Yes. *** just enough air in here, we're - *** it's open, babe. Okay; it is open.
04 18 24 12	LMP	*** Okay; *** prep, PLSS primary H_2O. I've got to figure out how to open that now.

	CDR	Okay.
	CDR	When you're at 5 psi, it's - *** did really train for this in the right way.
04 18 24 39	LMP	Yes, we did. Okay. My water *** OPEN.
04 18 24 47	CDR	And my water is OPEN.
	CDR	Okay. Well, let's see, rest until cooling sufficient; *** 4.6. I'm to 4.9; coming down.
	LMP	Yes, I am, too. Coming down.
	CDR	CWEA status.
	CDR	*** and ECS. Can you see that?
	LMP	See a PREAMPs, and I see ECS, barely.
04 18 25 18	CDR	Okay. WATER SEP component light, on.
04 18 25 22	LMP	WATER *** WATER SEP. Well, the next thing it says *** Gene gets out.
	CDR	I don't see that.
	LMP	That's what it says on my checklist.
	CDR	Okay. *** heavens! That means you got to get out of the way so I can open the hatch.
	LMP	*** I'm going to have to turn around a little, I think.
	CDR	Okay.
	LMP	So I can help you.
	CDR	Okay. *** beware of that corner.
	LMP	It's high pressure (laughter).
	CDR	Yes. I tell you, at 4-1/2, you're really pretty heavy.

	LMP	What was that that came shooting up here? A piece of bread? (Laughter) Would you believe that?
	CDR	Yes, I'd believe it.
	LMP	*** is our hatch open? Somebody opened our hatch. Are you getting cooling?
	CDR	I'm beginning to, I think.
	LMP	*** got a water flag. *** hot. Stand by. ***
04 18 26 39	LMP	How does the water pressures look, Houston?
04 18 26 46	CC	Challenger, they're looking just a little bit low. We're still expecting it to build up. It's going to take a little while.
04 18 26 54	CDR	Okay. I'm getting down on my knees out here. How am I looking, Jack?
	LMP	You're just fine. I'm holding you away from the DEDA, the D - DSKY.
	CDR	Okay. I'm going to put this visor down now, I think. *** look to you?
	LMP	***
	CDR	*** my legs? Am I getting out?
	LMP	Well, I don't know. I can't see your legs.
	CDR	Oh, okay (laughter).
	LMP	I think you're getting out though, because there's not as much of you in here as there used to be. Oh, hey; *** when I get down there, I got to fix your tool harness. Hold it.
	CDR	Okay. Can you reach it?
	LMP	It's come off the bottom again.

	CDR	*** you reach it?
	LMP	Well, I can't do it now, because it's come off from the bottom. I'll have to fix - -
	CDR	Oh, the bottom of the PLSS, huh?
	LMP	Yes.
04 18 27 46	CDR	Okay. *** my legs are out. Keep that hatch open.
	LMP	Can you squat down any farther, because you're hooked on - you're making it worse. Okay.
	CDR	How's that?
	LMP	Okay. Now, I think I - be careful because you might hook it on something down there.
	CDR	Oh, the tool harness?
	LMP	Yes. The back. It's loose on your back; on the back of the PLSS.
	CDR	Oh, man, I don't like that. Okay. I'll watch it.
	LMP	Well, I'll fix it when I get out there.
04 18 28 21	CDR-EVA	Okay. I'm still reading 4.0. Houston, commander is on the porch *** Challenger.
04 18 28 30	CC	*** We copy you, commander, and your feed water pressure is looking much better now, and you're probably getting cooling.
	CDR-EVA	Okay. Everything else look good to you?
	CC	That's affirmative.
04 18 28 46	CDR-EVA	Okay, Jack. I'm going to get the MESA.
	LMP	Okay. And I'll have an ETB ready for you.
	CDR-EVA	Oh, man; *** man; *** man.

	LMP	Deploy MESA.
04 18 29 00	CDR-EVA	Okay. Here it comes.
04 18 29 08	CDR-EVA	There she goes, babe.
	LMP	Yes, hey!
	CDR-EVA	There she is. All the way down; it looks like. Okay. I jettisoned - Oh, you want an ETB?
	LMP	That's up to you.
	CDR-EVA	Yes.
	LMP	*** commander.
	CDR-EVA	*** got it. *** got it. And the pressure looks like it's started to stabilize at 3.8. I don't know whether I'm getting cooler or not, but I feel pretty good.
	LMP	*** a jett bag, too?
	CC	Okay. We copy that.
	CDR-EVA	Okay. Oh, Jack, I could swing it over the - *** any problem. *** strut. Okay; and the jet bag is *** free - swinging free.
	LMP	You mean the ETB.
	CDR-EVA	ETB. Oh, man. This looks like a Santa Claus bag.
	LMP	It is.
	CDR-EVA	Oh, boy. *** it goes. The Rover looks in good shape. ***B is down there. Okay. I've got all my visors down. Jack, I wouldn't lower your gold visor until after you get on the porch, because it's plenty dark out here.
	LMP	Okay.
	CDR	Okay.
04 18 30 40	LMP	Tape recorder ***

EVA-2 FINAL PREPARATION

05 17 25 XX	LMP	VHF ANTENNA, EVA.
	CDR	Okay; EVA again. Go.
	LMP	UP-LINK SQUELCH, ENABLE.
	CDR	*** SQUELCH, ENABLE.
	LMP	Okay. Stand by where you are.
05 17 26 05	CDR	On mine, I've got to get - S-BAND is T/R. ICS is T/R. RELAY is OFF. MODE is VOX. VOX SENSITIVITY is *** I'm in VOX. VHF A is T/R. B is RECEIVE. A, T/R; B, RECEIVE. *** read commander on VOX?
	CC	*** clear, Geno.
	CDR	Okay, Jack.
	LMP	Got the LMP on VOX?
	CDR	They probably hear you.
05 17 26 49	CDR	*** 16, SE AUDIO, OPEN.
	LMP	SE AUDIO to OPEN.
05 17 27 34	CDR	Okay. Your PLSS PTT to MAIN, right, verify? PLSS MODE A?
	CDR	Okay. You'll get a tone, a vent flag, a press flag, and an O_2 flag.
	LMP	Press flag, tone, vent flag.
	CDR	Okay. Give Houston a call, and give them your - your oxygen reading.
05 17 27 57	LMP	Okay, Houston. This is the LMP with 93 percent, 93 percent.

	CC	*** read you loud and garbled, just like last night when the antenna was stowed.
05 17 28 06	LMP	Okay. And 93 percent.
	CDR	Okay, Houston. You got 93?
	CC	Copy the 93 percent.
	CDR	Okay. He got that, Jack. Okay. We'll leave the antenna in. Okay. On mine, I'm going to OPEN my AUDIO and connect to the comm, Jack.
	LMP	Okay.
05 17 29 26	LMP	Okay, Houston. ... on ECS. Cabin pressure may be high. *** a little pumping in the ECS system - in the hoses.
	CC	Roger. Stand by on that. *** Challenger. We're seeing it at the WATER SEPARATOR.
	CDR	Yes, we can see that. *** have a bleed on yours.
	CC	*** pull the WATER SEPARATOR circuit breaker.
	CDR	*** hit your disconnect.
	LMP	Okay.
	CDR	Okay. That's better.
	LMP	That should do her. I think we've fixed it. *** the hoses in my storage box.
	CC	Okay. Copy that.
	CDR	*** give them. Houston, CDR is reading - 90 - 91 percent.
	CC	Okay. Copy 91.
	CDR	*** that, Jack?
	LMP	Yes, they got it.

	CDR	Okay. LMP comm check - okay. You did them?
	LMP	Yes ... - -
	CDR	Okay. You go B, and I'll go A.
05 17 30 47	LMP	Okay. Going B, Houston. LMP on B.
05 17 30 52	CDR	Okay. And the CDR is B. I - I'm reading loud and clear. Houston, how do you read CDR?
	CC	*** loud and clear.
05 17 31 01	CDR	Okay. Let's go to AR, Jack. You'll get a tone.
	LMP	Okay. You're loud and clear. AR.
	CDR	Okay.
05 17 31 09	LMP	I'm AR. How do you read?
	CDR	And I - You're loud and clear. How me?
05 17 31 13	LMP	And so are you.
	CDR	Got my tones.
	LMP	Yes, and I got mine too.
05 17 31 16	CDR	*** an O flag and a vent flag, press flag and a - -
	LMP	That's affirm.
05 17 31 19	CDR	Okay. Houston, how do you read CDR?
	CC	*** clear, CDR.
05 17 31 26	LMP	And how do you read the LMP?
	CC	*** clear.
	CC	Okay.
	CDR	Okay, Jack. VHF B, full decrease.

	CC	And we have good PLSS data for both of you.
	LMP	SQUELCH?
	CDR	Full decrease.
05 17 31 39	LMP	Yes, that's SQUELCH. VHF B, SQUELCH.
	CDR	Okay. On 16, ECS LGC [sic] PUMP, CLOSE. Why don't you CLOSE it again?
05 17 31 44	LMP	Okay, it's CLOSED.
	CDR	Okay. On 16, CABIN REPRESS, CLOSE.
05 17 31 49	LMP	REPRESS - is CLOSED. Hit this, too.
	CDR	Okay. CABIN REPRESS, CLOSE. SUIT FAN DELTA-P, OPEN?
05 17 32 07	LMP	DELTA-P is OPEN.
	CDR	SUIT FAN 2, OPEN?
05 17 32 10	LMP	2 is OPEN.
	CDR	Verify ECS CAUTION and O_2 - and WATER SEP lights come on in about a minute. Okay. We'll watch for it.
	LMP	Okay.
	CDR	SUIT GAS DIVERTER, PULL-EGRESS. These are verify.
05 17 32 19	LMP	Okay. That's EGRESS.
	CDR	CABIN GAS RETURN, EGRESS?
05 17 32 23	LMP	Okay. EGRESS, yes.
	CDR	SUIT CIRCUIT RELIEF, AUTO.
05 17 32 25	LMP	AUTO.

05 17 32 26	CDR	Okay. Your OPS connect. SUIT ISOL ACTUATOR OVER-RIDE, SUIT DISCONNECT. Disconnect your hoses. Secure about PGA. They're stowed.
05 17 32 33	LMP	That's done.
	CDR	Connect your OPS hose to PGA, blue to blue.
05 17 32 37	LMP	*** going to PGA, and I'll turn around and let you.
	CDR	Okay. Make sure I get that, because it's under that connector.
	LMP	Okay. Did you already get - Let's see, where are we here?
	CDR	Right here.
05 17 32 54	LMP	Oh, here it is now. MASTER ALARM and ECS light; WATER SEP light.
05 17 33 08	CDR	Okay. It is locked; it is ON.
	LMP	Okay.
	CDR	Now, you want 211, right?
	LMP	Roger. 211.
05 17 33 18	CDR	Okay. Bob, LMP is getting purge 211.
	LMP	And out to the side - There you go.
	CC	*** copy that. Thank you.
05 17 33 33	CDR	*** lock it. Okay. And you are LOW, and you are in, and you are locked.
05 17 33 40	CDR	Okay. Purge valve is in. And you're in vertical.
	LMP	Okay. You get to do the same. Okay, get my hose?
05 17 33 45	CDR	Water hose.
	LMP	Come around behind my shoulder.

	CDR	*** won't fit in there. *** in there and it's locked, *** and the dust cover is on.
	LMP	Okay.
	CDR	And now, we get to put your purge in 208.
	LMP	Make sure it's in LOW.
05 17 34 16	CDR	It is, and LOW, and the pin is in. *** like it where? Down a little bit?
	LMP	*** place just - No, let me show you.
	CDR	Right there?
	LMP	Yes.
05 17 34 42	CDR	Okay, there. *** still in LOW and locked. Okay. That's good.
	LMP	Let's get another zap of water here.
	CDR	If I have any more water, I'll float out there. (Laughter) Good Navy man.
	LMP	*** good place to fill with water; you'd make a nice rec site out of this valley. *** some cabins up on the side of the massif. *** flat bottom, no trees. *** mags up. *** ought to be pretty good if you stocked it.
	CDR	Have a bear island and a family island.
	LMP	(Laughter) *** to fill up the other end though, so it doesn't drain out.
	CDR	*** like that.
	LMP	*** your DESCENT WATER OFF.
	CDR	Snaps, snaps, snaps; the whole world is held together with snaps!
05 17 36 09	LMP	Okay; I've got my hand lube. You can position your mikes.

05 17 36 12	CDR	Water is going off.
	LMP	Okay. *** your mikes now. Before we turn the fans on and use battery power, let's just look ahead. We've got helmets ready to go. Big bag position you happy with?
	CDR	Yes, more or less, a little far out, but I think - -
	LMP	Make sure you've got the plug out.
05 17 36 28	CDR	Okay. Plug is out. My end's red now, but *** get it out. *** a little pressure in there. You might let out.
	LMP	Okay. And then we'll lower our protective visor and secure tool harness and self-doff straps.
	CDR	Okay, and that's - -
	LMP	That's already stowed. Okay. Let's start with you first. You can turn your - Let me get your ..., and then you can get it over your head and turn your O_2 - your fan on, rather.
	CDR	Okay.
	LMP	*** you ready?
	CDR	Okay; check all that - -
	LMP	Wait. What is this right here? Okay; now let me make sure it's in front of everything.
	CDR	Okay.
	LMP	The alignment is way over here. Let me - -
	CDR	That's good. Okay. That's aligned right there.
	LMP	Oh, boy.
	CDR	*** never do. *** down in there. *** still clear. Manischewitz.

	LMP	I think it's caught on the food stick. I think you ought to open it up.
	CDR	I think you're right. *** way off.
	LMP	Okay. Now let's try it. *** it's going to be much better. Getting it back. *** make sure that thing is on. *** happy yet. *** happy yet. *** what now. I tell you, I got my fingers on it all the way around.
	CDR	Okay. It's locked. It's aligned. *** your fan on here pretty quick.
05 17 39 11	CDR	Okay. Fan's on. Okay; let me get you dressed up back here. *** center doesn't work, you're going to keep this thing - -
05 17 39 20	LMP	*** vertical.
	CDR	*** vertical, all right. Okay. You're covered down there. *** are locked. Okay - whoo! Okay?
	LMP	*** my turn.
	CDR	*** verify all these things.
	LMP	Okay. Go ahead.
05 17 39 55	CDR	Okay. Got your comm. *** your OPS, *** your inlet, your exhaust, and your purge valve.
	LMP	Okay.
	CDR	And your water.
	LMP	Okay; let me take a look at all yours. Okay. That's locked *** locked, you're vertical. *** locked. *** locked. *** locked. Okay. Get my helmet on. *** is to get this stuff back over here.
	CDR	Yes. Way out.
	LMP	Okay. Can you grab your food stick, because that - that hung up on mine.

	CDR	Okay.
	LMP	Feels good in the back?
	CDR	Yes. And it's locked.
	LMP	It's hard to see with that visor on there.
	CDR	Okay. That's latched down. You're locked again. And she's in the engaged position here, huh?
	LMP	That's affirm. *** engaged. Okay. Verify, verify, verify. Circuit breaker wiped out plus EVA decals.
	CDR	Whoo! Can you give me a little room to turn?
	LMP	Yes. Go ahead.
	CDR	Okay. *** pump on for a minute.
	LMP	Yes.
	CDR	*** EVA decals, all right?
	LMP	Okay. *** over here? Let me turn the page. *** EV gloves.
	CDR	Okay. In work.
	CC	Geno, we don't see your fan on. If you've got your helmet on, you ought to have your fan on.
	CDR	*** Bob. Good call. The royal MOCR ... *** grease and lunar *** really make a nice mobile graphite material.
05 17 43 50	LMP	Okay. I'm locked on the right, verified. The old *** *** I've got my cover on over here. Get yours?
	CDR	Yes, I'm getting one of them anyway.
	LMP	I can get the other one for you. Okay. Number 2. *** many.
	CDR	And it's on, and locked, and locked verified.

	LMP	*** learning how on these, finally. Okay. Mine's on and locked. *** get my black band on here. I think I'm learning how, Geno. Crazy. Like a trained *** putter-onner. Okay. I feel pretty good. *** help?
	CDR	No, mine's all on. I can't figure that out. Must be easier in 1/6 g.
	LMP	(Laughter)
	CDR	*** gauntlet donned. *** dirt protecting dirt.
	LMP	Don't throw down a gauntlet, Gene.
	CDR	That's dirt protecting dirt. Okay. It's all on, Jack.
	LMP	Okay. Where did we leave off?
05 17 46 09	CDR	Right up here.
	LMP	Okay. PGA is not biting; LCG's cold. Let's leave it cold.
	CDR	*** got to open it now. We've got to disconnect the water.
	LMP	You ready?
	CDR	Yes.
	LMP	Let's do it then.
05 17 46 25	LMP	Okay. It's disconnected.
	CDR	Okay; and did you disconnect your - -
	LMP	Let me come around. Okay; let's turn around and let's help each other. Let's get the - -
	CDR	*** still 3 degrees.
	LMP	This 5 degrees pitch of yours is an awful nuisance, Cernan.

	CDR	Hold that for a minute.
	LMP	I don't know why you don't learn how to land one of these things.
	CDR	Hold that for a minute. It was a pitching deck. Okay; that is in. Boy, it's in. *** took a lot to ***.
	LMP	Okay. Dust cover is covering it.
	CDR	Okay. You know those chamber runs we had were probably some of the best training we ever did. I hate to say that *** was some work. *** that thing on. *** go. Good. Keep trying. *** a little sluggish. *** verify it. It won't turn. Oh, every time you do that, my stomach gurgles. (Laughter) Okay; let me turn around to stow.
	LMP	You can stow that. Mine's over here.
05 17 48 05	CDR	Okay. Connect our PLSS water hoses. PLSS DIVERTER VALVE, MIN. *** verify that?
05 17 48 19	LMP	And connect PLSS water hose, verify lock, PLSS DIVERTER VALVE, MIN, and PLSS pump ***.
	CDR	Wait a minute. *** to make sure this is out of the way *** I come in.
	LMP	*** my DIVERTER, MIN.
	CDR	Your DIVERTER - it's MIN.
	LMP	To MIN? Your pump's on, and PRESS REGs A and B, EGRESS.
	CDR	*** on.
	LMP	Man, I'm getting a little bite in my - -
	CDR	Okay. The next thing is to turn your PLSS O_2 ON, anyway.
	LMP	Oh, okay.

	CDR	Then we go to EGRESS.
	LMP	EGRESS.
	CDR	EGRESS on the REGs.
	LMP	The REGs are EGRESS.
	CDR	Okay. You ready on my mark? *** when you're ready.
	LMP	Find it. Well, where is it? Okay; let's go ahead.
	CDR	Okay -
05 17 49 40	CDR	MARK it. If not, I'll get it for you. Here. Let me get it for you. Wait a minute. I didn't get it. No, there it is. Okay; I've got it. Okay. We going at the same time I've got us marked.
05 17 49 55	CDR	Okay. PLSS O_2, tone on, O_2 flag. *** flag clear 3.1 to 3.4. *** gage 3.7 to 4.0.
	LMP	Do you need me to watch the panel, or you got it?
	CDR	No, no sweat; I've got that. *** to get the PLSS O_2, OFF. I'll get mine; I can reach yours real easy. *** get it in a minute. *** as we get up, I'll get it. *** reach it, I think, now. And we're going up to HIGH PRESSURE here, where we start dumping the cabin. I've gone through 3.5 now - 3.4 really.
	LMP	*** the peg here. *** flag did clear.
	CDR	There's mine.
05 17 51 20	LMP	Turn mine off. *** it. It's off. *** you?
	CDR	At 385.
	LMP	Okay; when you get up, you can turn yours off. Give me a hack, and I'll check the time.

05 17 51 30	CDR	Okay. Mine's off.
	LMP	Okay. Check your pressure.
	CDR	38. I went at 20; you went at 30.
	LMP	It looks like it's a little tighter.
	CDR	That was the suit loop we were checking yesterday up in orbit, though.
	LMP	Yes, but you know we got 0.2 yesterday, too. I did.
	CDR	I'm coming down 20 more seconds; you got 30 more seconds. I'm over about 0.1, I guess.
05 17 52 18	CDR	Okay; 1 minute for me Houston; *** to 7 - about 7.2. Okay. That it?
	CC	Copy that, Geno.
	LMP	Okay. And the LMP was 8 - 0.8 to 0.7.
	CC	Okay. Copy that.
	CDR	And I'm back on. Okay; and we'd like your GO, Robert.
	CC	We see it, and you look good from here. You're - you're GO for DEPRESS.
05 17 52 53	CDR	Okay. Jack, on 16, CABIN REPRESS, OPEN, and CABIN REPRESS valve, CLOSED.
	LMP	Okay; CABIN REPRESS. Circuit breaker first, right?
	CDR	Circuit breaker first. CABIN REPRESS, OPEN.
	LMP	Okay. Might turn around here. Okay; it's open. Okay. And REPRESS valve, CLOSED.
	CDR	Okay. It's going CLOSED. And then stay over there as far as you can, because I got to get the OVER-HEAD DUMP valve.
	LMP	Okay; I'm over as far as I can get. I can turn around and give you more room.

	CDR	Yes, turn around. You'll have to look at the CABIN.
	LMP	Watch yourself there. *** awful weak all of a sudden. Are you - Hello. How do you read?
	CDR	Very weak. You better call again.
	LMP	Very weak?
	CDR	Okay. My volume got tang - -
	LMP	You got to hit your volume.
	CDR	Okay, now.
	LMP	Let me get over here - -
	CDR	Wait a minute.
	LMP	Yes, your arm's in the way.
	CDR	Okay. *** at it now.
	LMP	You want to go to - you want to get that - OPEN then AUTO at 3.5. Okay; go ahead.
	CDR	Okay. Coming down. I can see it open. There it is. That's 5, 4-1/2, 4, stand by -
05 17 54 06	CDR	MARK it. *** okay; about 3.4. And I got a watch.
	LMP	Looking at a watch. Okay.
	CDR	And my cuff gage went up to 5. - 5.0. *** circuit's at 4.6. *** Okay. And I'm decaying. *** decaying?
	LMP	I'm decaying.
	CDR	Okay. We can start our watch.
05 17 54 48	CDR	Okay. My watch is started at 5:30, more or less. At 5:30.
	LMP	Yes, sir. Okay.

05 17 54 59	CDR	Okay. OVERHEAD FORWARD DUMP valve, OPEN.
	LMP	Okay, baby! It's OPEN all the way.
	CDR	Okay; and pressure's coming down.
	LMP	Okay. I believe it.
	CDR	You should get a tone and an H_2O flag, and you should pop your RELIEF, I think.
	LMP	Yes, I'm at my relief pressure now.
	CDR	What's CABIN now?
	LMP	CABIN is 1 - a little 1.2.
05 17 55 48	CDR	Well, let's see if I can partially get this hatch open.
	LMP	That's 0.7 still, Gene.
	CDR	Okay.
	LMP	0.5. 0.3. *** at what - about 0.2 yesterday?
	CDR	Why don't you move over as far to the right as you can - -
	LMP	Okay.
	CDR	- - so I can bend down.
	LMP	Well, I think that's - -
	CDR	Okay.
	LMP	That's good. I can reach it.
	CDR	*** too much pressure on it yet.
	LMP	Okay. About 0.3. Okay. There's my H_2O full - flag. *** that case, let me see if I can't get the - Oh, man. It's unlocked, huh?

	CDR	Yes, I unlocked it earlier.
	LMP	0.2.
	CDR	Hey, it's unlocked. *** again. *** comes.
	LMP	There goes all the junk out there again. Guess that's ice. Okay.
	CDR	Probably cleaned some of the dust out, I hope.
	LMP	Yes, there goes a lot of junk.
	CDR	*** wish it would clean the dust out, but it isn't. It's cleaning everything else out.
	LMP	Okay, Geno. We turn our PLSS WATER ON.
	CDR	Okay.
	LMP	If we can get to it. *** like a water valve.
05 17 58 07	CDR	Okay. Mine's ON.
05 17 58 08	LMP	LMP's WATER's ON.
	CDR	Okay.
	LMP	Okay.
	CDR	Open - -
	LMP	Be right there.
	CDR	What? My water flag is clear.
	LMP	*** means you've got feedwater pressure.
	CDR	Okay. Open hatch. Rest until cooling sufficient; verify PGA 3.7 to 4.6. *** coming through 4.8; let me stand there a second. *** status, PRE AMPS, and ECS.
	LMP	Roger.
	CDR	WATER SEP component light, ON?

	LMP	Roger.
	CDR	Okay.
	LMP	I mean affirm. Get my terminology straight here.
	CDR	Okay, Jack. I'm going to start doing about a 90 here.
	LMP	Okay. Let me - I need to turn around as soon as you do, so I can help you get under that - That's better.
	CDR	Okay; I knocked it off. Okay. I'm out of the way now, if you can move your left leg. Okay. I got an O_2 FLAG. And it's cleared. The pressure is 4.6. Okay, Houston. If you're happy, *** is going to get out.
	CC	*** happy, Geno.
	CDR	Okay. ... Okay.
	LMP	And you're still - you're scraping your - just a little bit. Just get your buttons down there. That's good. Okay. Oh, hey, remind me to fix your - -
	CDR	Foot straps.
	LMP	- - your - your donning straps.
	CDR	Okay. That is ice, by the way, Jack.
05 18 00 35	CDR-EVA	*** at 4.5. But I am out here on the porch.
	LMP	Okay.
	CDR-EVA	Oh, man. Okay; I'm out here.
	LMP	I've assisted you. Here comes the jett bag whenever you're ready.
	CDR-EVA	Well, let me get - Okay. I'm all set. Man, I wish this suit would come down to 3.8. Here it comes. *** any time. Give it a swat; there you go.

	LMP	Oh, the beauty of that bag.
	CDR-EVA	Okay; let me look at something here (laughter).
	LMP	What's that?
	CDR-EVA	I was just turning my checklist pages.
	LMP	Oh.
	CDR-EVA	Okay. Jett bag. I need - What you got next, ETB?
	LMP	ETB.
	CDR-EVA	Okay. Yes. Get it hooked up here.
05 18 02 12	LMP	Okay. Turn the TAPE RECORDER OFF. TAPE RECORDER's OFF.

EVA-3 FINAL PREPARATION TO POST-EVA-3

06 16 22 33	LMP	VHF ANTENNA, EVA.
	CDR	EVA.
	LMP	UP-LINK SQUELCH, ENABLE.
	CDR	ENABLE. Okay; blow your nose while I get mine.
	CDR	Okay. On mine, I want T/R. T/R. RELAY, OFF. MODE, VOX. VOX SENS at MAX. A, T/R, and B is RECEIVE. On 16, your breaker open and connect to PLSS comm. Okay; PLSS PTT, MAIN, right, verify, and go MODE A.
	LMP	Okay.
	CDR	Okay; I got you. You'll get the tones, the vent flag, the press flag, and O flag.
	LMP	Okay.
	CDR	Call Houston and give them your O_2 reading.
	LMP	Okay, Houston. This is the LMP on MODE A, and my oxygen is 94.
06 16 24 40	CC	*** Jack, you're loud and clear.
	LMP	Okay. I'm getting a little bit of a squeal on the initiation of my transmission.
	CDR	Yes. I hear that too, but it's *** clear here. Okay; I'm going mine open.
	CC	*** PLSS data looks good down here.
	CDR	Yes. There's the tone. There's a press flag and a vent flag.
	LMP	And you're - -
	CDR	At 16, our LCG PUMP is CLOSED.

LMP Yes.

CDR At 16, CABIN REPRESS, CLOSED, verify.

LMP It's verified.

CDR SUIT FAN DELTA-P, OPEN, and SUIT FAN number 2, OPEN.

LMP OPEN and OPEN.

CDR Okay; we should get a light in about 1 minute. Stand by for that. Okay; SUIT GAS DIVERTER to PULL - These are "verify" - PULL-EGRESS.

LMP Okay; PULL-EGRESS.

CDR CABIN GAS RETURN, EGRESS.

LMP Okay, Houston. You want us to go by the checklist now on the ECS system? Say again. You didn't come through.

CC Roger. As per the checklist.

LMP Okay. EGRESS on CABIN GAS RETURN.

CDR Okay; that's SUIT GAS DIVERTER, EGRESS; CABIN GAS RETURN, EGRESS.

LMP EGRESS and EGRESS.

CDR And SUIT CIRCUIT RELIEF, AUTO.

LMP AUTO.

06 16 28 08 CDR Okay; OPS connect - You're first. SUIT ISOLATION, ACTUATOR OVERRIDE, and SUIT DISCONNECT.

LMP Okay; that's done.

CDR Your hoses are stowed?

LMP They're stowed.

06 16 28 17	CDR	Okay. Connect your OPS hose, and I'll get you a number 211.
	LMP	Let me turn around so I don't - -
	CDR	Okay.
	LMP	That'll do it. *** poking this water hose here.
	CDR	211 is yours.
	LMP	208 is mine.
	CDR	Okay; the pin is in. It's closed; you're in LOW FLOW.
	LMP	*** still works.
	CDR	*** any more?
	LMP	Yes, I do.
	CDR	*** through with it?
	LMP	I think so. Right now. ...
	CDR	I can get down there if you can't, Jack.
	LMP	... I can reach it. I got it; I can reach it.
	CDR	Okay; let's get your OPS hose. *** hose. OPS hose. *** down here. That's your water hose. Here's your OPS hose. Now, let's get the dust cover on it. *** in. I verified it's locked, and the lock - lock is in. Cover is up, and we'll take another look at them. Okay. Okay; we got the MASTER ALARMs.
	LMP	Water *** is 3 amps. Sluggish one.
	CDR	But it's in, and it's lock - and locked, and you're on - the - that's high. That's low. You're on LOW FLOW. *** in and everything's locked. Okay.

LMP Purge valve closed, locked. That's on LOW. Install purge valve. DIVERTER VALVE, VERTICAL.

CDR Okay. Okay; you want it on VERTICAL. Pick up my OPS hose.

LMP It's your OPS hose time.

CDR Where's the top? I'll put yours on top.

LMP That's fine. It's as good as anything.

CDR *** makes any difference. *** and locked, and dust cover, verify. *** the comm?

LMP Okay; and - -

CDR That one's locked, verified. Here's purge valve, and it's number 208, I hope.

LMP No, you wanted a 211.

CDR No. I wanted 208. I want 208, and you want 211.

LMP No. I'm sorry. That's what I copied down.

CDR Verify that, will you, Bob?

CC 211 for the LMP. 211 for the LMP.

LMP That's right. That's - -

CDR Okay. That's what he's got.

LMP Somehow I copied the wrong one.

CDR Okay; give me 208.

LMP Same thing we had yesterday.

CDR Well, I think I'd remember from yesterday, and that's what I thought Gordy said. Okay. That's in, locked, verified.

LMP On LOW?

	CDR	On LOW and the pin's in. Okay.
	LMP	Just check this one. Good. All right.
	CDR	Okay. We just had our drink. You can turn drink - DESCENT WATER, OFF.
	LMP	Okay. DESCENT WATER is OFF.
06 16 31 50	CDR	Any my hand lube is all prepared. *** the scissors and the ETB. I think we finished up with that.
	LMP	They're in there.
06 16 31 59	CDR	Okay. Position mikes.
	LMP	Okay.
	CDR	Okay. Here we go again; let's take a look at it. PLSS FAN will come ON. *** and LEVAs. Drink bag position. Lower LEVA protective visor and secure tool harness strap, and we'll verify the following - Let's verify the following, *** go ahead and put your PLSS FAN ON and get your helmet. And you can put mine on.
	LMP	Okay; going through one more time. *** connector, and it's locked. And your OPS is locked, covered. *** water yet. Exhaust is locked, covered. Inlet is locked, covered. Purge is locked and LOW.
	CDR	Okay.
	LMP	And VERTICAL on our DIVERTER VALVE.
	CDR	That's right. *** me take a check. Comm is locked and covered. *** locked - and covered. *** exhaust is locked and covered. You're VERTICAL. *** valve is locked and LOW. Okay; let me get your helmet here.
	LMP	Let's look at one thing here, Geno.
	CDR	Let me put this up here. *** out of the way, because that's half the battle.
	LMP	*** look in.

	CDR	That - that shade; then you can check it.
06 16 33 37	LMP	That's what mine looks like. They're all stiff. Mine - mine is a little stiff too. It'll come, if you pull. If need be, I can pull it down for you.
	CDR	Yes. Okay.
	LMP	I can get that one up another one. *** paraphernalia there. Can you pull - that - pull that stuff away from there? Okay.
	CDR	Jack, let me - let me undo this. I just want to make sure I get my fingers on this thing and make sure it's locked. Can't get it on. Do it. There, that got it. Okay; that should have it. *** FAN here in a minute. Okay; you got your FAN ON?
	LMP	FAN's ON.
	CDR	Good. Okay; I want to verify it right now. Your helmet is locked. It's aligned. It's *** It's locked. *** down in back. Your LEVA is locked. Your FAN's ON, right?
	LMP	Yes.
	CDR	Okay; let's pick mine up.
	LMP	Okay. You can feel that rim all the way around. Wait a minute.
	CDR	Well, let me - you just - -
06 16 37 02	CC	And, Geno, we don't see your FAN ON yet.
	CDR	It - it'll come ON, Bob.
	LMP	There, it's locked.
	CDR	Okay. Are the engage marks marked?
	LMP	Well, they are now.
	CDR	Okay.

	LMP	That's in alignment only.
	CDR	Okay, Bob, my FAN's ON. It is locked? Look good to you?
	LMP	Yes. Fine. Good.
	CDR	Okay.
	CDR	*** locked. *** down and back?
	LMP	Yes. *** okay. Looks good. Okay; where are we here? Verify white dots plus EVA decals, and then you can don your gloves.
	CDR	Okay.
	LMP	Okay. Why don't you turn that way, and let me turn this way?
	CDR	Okay, Jack. I'm going to turn these lights off.
	LMP	Okay.
	CDR	We don't need those.
	LMP	Okay. EVA decals, white dots.
	CDR	Okay; URINE LINE HEATER's going to come OFF, and the breaker is OUT. Okay.
	LMP	Okay; I'm ready except for LTC pump - LCG pump.
	CDR	Okay; leave it on. We can don our gloves now.
	LMP	Okay.
06 16 38 33	LMP	Okay. Right glove is locked and verified. *** wrist cover is on there. *** very dirty. Boy, do I need a shave (laughter). Okay. I got all mine down.
	CDR	*** all set?
	LMP	I got my left hand. Got the left hand. Now, let's see what I can do with the right hand. Almost tempted to take those cover gloves off today.

	CDR	I might take a look at that, too. *** to argue with success, but I need that dexterity today. Bob, I don't know if you caught it yesterday - a little interesting facet of the whole two-EVA exercise was the fact that I've already worn - -
	CC	*** dropped out there right in the middle. *** Houston. *** you dropped out there.
	CDR	Okay, Bob. How do you read now?
	CC	Loud and clear, Gene.
	CDR	Okay; I hit the VOX switch on my audio panel.
	LMP	You did?
	CDR	Yes, when I picked up my glove. Okay, Bob, the only thing I said *** point of interest, I *** RTV off the *** of it - but right through the bare metal on the hammer - someday - some time in the previous 2 days. No problem; it just interests me.
	CC	Okay; copy that. And copy that you still have your cover gloves on today, right?
06 16 42 50	CDR	Yes, sir. I'll tell you, we have become very respectful of the dust.
	CC	Copy that.
	LMP	*** cover gloves, yes. We've also got the - we've also got the wrist dust - dust covers on too.
	CC	Roger. Strike a blow for Mason jar rings.
	LMP	*** what's left of the cover gloves.
	CDR	Okay, Jack. You're on?
	LMP	I'm on.
	CDR	In lock?
	LMP	In lock.

CDR Well, I just - I got my thing - I want to make sure I'm locked again. Yes, I am. I took it off again. *** was. *** you just do things - Okay. Don EV gloves. Cover, okay. PGA biting? No. Okay. LCG cold, as required, and LCG PUMP, OPEN. I guess you can OPEN it.

LMP Yes, and disconnect the LM - -

CDR Okay. LCG PUMP ***. And I got a tone, but that's because I turned my oxygen on briefly. Okay. Okay; PUMP's OPEN. Turn around here and help you.

LMP You can - you can take the water off.

CDR *** off.

LMP *** pumps off?

CDR *** water's off. Set that there for a minute. Okay; hang on. Okay; you're in and locked. *** over nicely. Okay.

LMP Okay.

CDR You're off. I'll lay that there. Where's your water? Here it is, way over here.

06 16 44 41 CDR *** lock and your cover's on. I got to zap my PGA. Wait a minute, I'm biting here.

LMP Okay. *** verify your PLSS is - WATER's MIN when you get a chance.

CDR Okay; that's verified. Did that a minute ago.

LMP And mine's verified, and your PUMP, ON.

CDR Okay; PUMP's going ON.

LMP Mine's ON. PRESSURE REG A and B to EGRESS.

CDR Okay; they are EGRESS.

LMP Okay; pressure integrity check. Ready?

	CDR	Let me ...
	LMP	Okay.
	CDR	Awful lot of line there, isn't there?
	LMP	Yes.
	CDR	*** exactly what to do with it. *** Okay.
	LMP	All right. You happy?
	CDR	Yes.
	LMP	PRESSURE REGs A, B, to EGRESS.
	CDR	They are EGRESS.
	LMP	Okay. Put your PLSS O_2 WATER *** now -
06 16 46 40	LMP	MARK it.
	CDR	PLSS O_2, ON?
	LMP	PLSS O_2, ON.
	CDR	Right. Okay; it's ON.
	LMP	Okay; and mine's ON. We'll wait until it builds us up. Press flag should clear at 3.1 to 3.4; O_2 flag will clear at 3.7 to 4.0.
	LMP	Okay; I'm coming up. Hope the old suit integrity is just as good as it has been. *** why not. Yes. About 3.5 now.
	CDR	Yes, me too. Okay; let me know when you are up.
	LMP	I think I'm up; I'm 3.8.
	CDR	Okay; let's see if we can't get these *** get yours.
	LMP	I can. I got it.
	CDR	Okay; mine's OFF.

	LMP	Mine's OFF.
06 16 48 23	CDR	MARK it.
	LMP	*** wanted decay for 1 minute.
	CDR	Okay; I started at 383.
	LMP	Okay. That's about exactly where I was. *** 45 seconds to go.
	CDR	Okay. *** looks as tight as it was yesterday.
	LMP	Another 30 seconds. Maybe lunar dust is a good sealant.
	CDR	Houston, CDR was at 382 to 270.
	LMP	270? 370.
	CDR	370.
	CC	Understand 370.
	LMP	Okay; LMP was - LMP was - 83 to 70.
	CDR	Okay, Jack. You can get your O_2 ON.
	LMP	It's ON.
	CDR	Okay. Can you move to the left a little bit - to your left? I got to get in front here. Okay; let me turn this over.
	CC	Okay. You're GO from here.
	CDR	Okay; stand by.
	CC	Copy you. GO for depress.
	CDR	Okay; it's a heck of a time to have to turn the checklist over. Okay; we've got a GO for depress. On 16, CABIN REPRESS, OPEN, and CABIN REPRESS valve, CLOSED.
	LMP	Okay.

	CDR	The breaker OPEN and the valve CLOSED.
	LMP	Okay; stand by. Can you give me a little room - -
	CDR	Let me - Okay; how's that?
06 16 50 25	LMP	Okay. Okay; REPRESS is OPEN.
	CDR	Okay. Now, why don't you face the wall over there and move in as close, and I'll get the OVERHEAD valve.
	LMP	Wait a minute, I've got to CLOSE the REPRESS valve. You got it all right. Okay; it's CLOSED, and I'll get where I was yesterday.
	CDR	Okay.
	LMP	How's that?
	CDR	We'll find out in a minute.
	LMP	Okay. I've got to get my PLSS.
	CDR	Can you get it?
	LMP	*** turn with my back to the wall, and you might have a little more - -
	CDR	Well, I think - I feel like I'm hooked on something. Wait. I can't turn either way. Stay where you are *** safety - Oh, boy, I'm glad I'm not an inch shorter. Okay; coming down, Jack. You ready?
	LMP	Go ahead, to 3.5.
	CDR	Okay; it's OPEN.
	LMP	Okay; 4.5 *** Stand by -
06 16 51 48	LMP	MARK. Okay; at 3.5.
	CDR	*** the checklist?

	LMP	Okay; I can. Okay. OPEN, AUTO, 3.5. Cuff checklist - cuff gage does not drop below 4.6. It hasn't.
	CDR	Mine's good.
	LMP	*** put your hand down. I can't read it.
	CDR	Okay.
	LMP	Cabin is holding at 3.5. And suit circuit is locked up at 4.5, and PGA is decaying greater than 4.5 - 4.6. Okay.
06 16 52 30	CDR	Okay, Bob. I'm starting my watch.
	LMP	Okay. You can go to - go to OPEN.
	CDR	Okay; it's OPEN.
	LMP	Okay; and pressure is going up. And the next step is, when you can, open the forward ***.
	CDR	Okay. My suit's relieving.
	LMP	Down to almost 1.5 now, psi. Okay; my RELIEF valve just seated at 5.3.
	CDR	Okay; where are we?
	LMP	We're at 0.5.
	CDR	I guess the next thing is to open the hatch, huh?
	LMP	Yes.
	CDR	I've got to get down at 5 here before I can turn too well and open the hatch. I'm going to let it come down a little bit this time, so I don't get down there unnecessarily.
	LMP	Yes. It's got a ways to go yet. About 0.3 now. 0.2.
	CDR	I've got a tone; it's water tone. Okay; I'm going to go after that hatch. Can you slip to the right as far as you can? Got it.

	LMP	Got to hold it until the pressure decreases. All sorts of junk going out there.
	CDR	Okay, now. Okay. It's partially open.
	LMP	Okay; get your water if you can.
	CC	Okay, Jack. We'd like you to CLOSE REG A, please.
	LMP	Oh, CLOSE REG A, huh? Okay.
	CC	That's affirm.
	LMP	Stand by. That's not an easy task.
06 16 55 42	LMP	REG A is CLOSED. Gene, can you get my water?
	CDR	*** Excuse me. Well, let's see.
	LMP	Okay; you got it open, so I need to turn around.
	CDR	*** you see in REG A?
	CC	Stand by, Gene. We're seeing high suit pressure. Stand by.
	LMP	High suit pressure?
	CC	Okay; and about - Challenger, Gene, you're GO to go out, and once you get out, maybe Jack can turn around and work on those *** better. We're seeing - I guess the suit looks a little high in pressure.
	CDR	Okay; I'm looking at 4 - at about 4.7 on the suit loop right now.
	CC	Okay; we copy that.
	CDR	Okay, Jack. You're a - There you go. Okay. What does it look like to you?
	LMP	Well, you're - you're doing great; keep down. Just a little hangup on the DSKY.

	CDR	*** mine. Arm down there.
	LMP	You need to go to your left a little to clear the purse and your harness. There we go.
	CDR	Jack, you see this? This is one of those cards that - -
	LMP	Yes, I saw that, Geno.
	CDR	I'll put it right there.
	LMP	Can you come forward just a little?
	CDR	Forward?
	LMP	That clip got away. Come towards - me, in the cabin - there.
	CDR	Okay?
	LMP	Wait a minute. Okay. I got it. Hey, you're in good shape.
06 16 58 44	CDR-EVA	Okay; I'm on the porch. *** still at 4.3.
	CDR-EVA	Okay; I'm on the porch, Bob.
	CC	Copy that.
	LMP	Okay; what do you want? What can I do for you, Bob?
	CC	*** Jack. We'll get a word to you in 1 minute.
	CDR-EVA	Okay. Jack, in that - Well, I guess that'll wait. Get my LEC ready for you. Okay. And everything looks normal on me, right now. *** down a little bit.
	CDR-EVA	Things normal, except a part of my nose itches I can't get to.
	LMP	I'll give you the jett bag anyway, Geno, while they're thinking. I guess that's part of - R&D. Oh, yes, the jett bag.

	CDR-EVA	Santa Claus' bag again.
	CC	Okay, Jack. We'd like to have you stay in just a minute or so longer. We're trying to keep track here of the suit circuit pressure and see if it stabilizes or starts to drop. The one reg which has been intermittently leaking - We still haven't isolated it. And we think we've got it shut off, but we're still watching it. So bear with us just a minute or so.
	LMP	I'm bearing, Bob.
	CDR-EVA	Hey, what else - -
	LMP	I thought you isolated it last night. Okay. Let me give you the ETB.
	CDR-EVA	Yes. *** and I'll be on my way - work on the TGE. *** it.
	CC	Okay, Jack. And how about taking the SUIT CIRCUIT RELIEF valve - Cycle it just to OPEN and then back to AUTO.
	LMP	Okay, Bob. Stand by.
06 17 01 03	LMP	SUIT CIRCUIT RELIEF going OPEN, then AUTO. That's done.
	CC	Okay. We'll watch it for a minute here and let you know.
06 17 01 19	CDR-EVA	Okay, Bob. I'm going down the ladder.
	CC	*** Geno.
	CDR-EVA	*** still there, Jack. "Godspeed the crew of Apollo 17."
	LMP	Good.
	CC	Amen there, Gene. Amen.
	CDR-EVA	Okay, Bob, I'm on the pad. And it's about 4:30, a Wednesday afternoon, *** step out on to the

plains of Taurus-Littrow, beautiful valley. *** thing I'll do is I'll turn the TGE on, and I'll give you a reading.

CC Okay; we're ready.

CDR-EVA And I'm very much interested - very much interested in my Rover battery.

CC *** you're GO for exit and looks like we've got it taken care of.

LMP Okay; and I'm checking the circuit breakers.

06 17 02 37 CDR-EVA It's on and read - Bob, it reads 222, 262, 207; 222, 262, 207.

CC *** copy that, Geno.

LMP Okay; get the visor down, Geno.

CDR-EVA Get the visor down. Holy Smoly! Think it'd be better to leave it up. Beautiful out here today, Bob. We can look to the east for a change - a little bit, anyway.

CC Okay; copy that, Gene.

CDR-EVA A higher Sun angle. Okay; I'll get the LCRU battery changed out.

CC Okay. And as you walk by there, if you walk by in the right side of the Rover, how about giving us a SEP temperature read-out, please.

CDR-EVA SEP temperature is 103 degrees; 103, and the mirror is still clean.

CC Copy 103.

CDR-EVA Well, let's see if I can change this little baby now. Supposed to be simple. Bob, we have no use for the old battery, right?

CC That's affirm.

06 17 04 46 LMP-EVA Okay. I'm on the porch, and the hatch is CLOSED.

CDR-EVA Oh, don't bump into that.

LMP-EVA Are you talking to me or you?

CDR-EVA I'm talking to me.

LMP-EVA Okay; that sounds familiar and looks familiar - the old plain. The valley of the Taurus-Littrow. You want to get your antenna?

CDR-EVA Yes, let me get that - -

LMP-EVA I'll come over there.

CDR-EVA I'll get the TV on. I've already got the battery changed.

LMP-EVA There's the Earth right in the middle of the antenna. Okay; verify MODE 3. I am in MODE 3. LCRU blankets are open 100 percent. Battery covers I'm closing, the battery *** get my antenna. Wait a minute. Let me set this down.

CDR-EVA Yes, okay.

LMP-EVA Okay; stay there.

CDR-EVA I was just try - I'm trying to.

LMP-EVA Okay.

LMP-EVA Okay; your antenna's up. Wait a minute. Come here, and I'll snap the snap.

CDR-EVA Okay.

LMP-EVA Didn't mean to do that.

CDR-EVA That's all right. I can't get close enough to you.

LMP-EVA Here you are.

CDR-EVA Lean a little more. Antenna's up. Let me get the snap.

	CC	And, 17, if you guys are interested, your shadows will be 8 feet long tonight.
	LMP-EVA	*** meters is that, Bob?
	CDR-EVA	I'll draw it out - I'll step it out for you. You can measure it (laughter).
	LMP-EVA	Well, I don't know. Should I take my gloves off? I mean my cover gloves.
	CDR-EVA	Why don't you leave them on for a while and see where we're going. See what the boulder field looks like up there.
06 17 08 16	LMP-EVA	Well, I know what it's going to look like.
	CDR-EVA	No, you don't.
	LMP-EVA	The point is my hands will be much better off without them.
	CDR-EVA	Take them off, then. *** battery covers are closed and tight. High gain is already oriented. Oh, they've even got TV, I guess.
	CC	That's affirm.
	CDR-EVA	Let me get these in. *** what my batteries are reading if I can.
	LMP-EVA	*** see if I can do something else while I'm waiting.
	CDR-EVA	No, I'm done, Jack.
	LMP-EVA	I'll get the old SEP receiver.
06 17 09 10	CDR-EVA	Well, Bob, the - battery 1 is 95 degrees and the - battery 2 is reading zero. So we got a gage failure. No, it's not reading zero; it's off scale low.
	CC	Okay; read that - copy that. That's a real cool-down, isn't it? Okay. Jack, if you're going to worry about the SEP, stand by and don't do the SEP

until after you worry with the ETB, and we'll get with you on that. When you get the ETB to the seat, I'll talk to you about it.

LMP-EVA *** 102 is the temperature.

CDR-EVA Okay, Bob. Mark - -

CC Okay; copy that.

06 17 10 00 CDR-EVA - - MARK gravimeter; it's flashing. Okay; we'll take the big bag. I hope we can keep it on.

CC Okay. A couple of things on that, Geno. You might try tapping the thing to see if that loosens the dust. There's also the hook business on the inside of the pallet that you could hook it on. Caution: If you open the pallet, be careful not to knock the clamps off the fender. But you can also reach over the pallet to put the big bag on.

CDR-EVA Okay, Bob. We - I brushed it and tapped it yesterday. I'm not sure we're going to have much luck with them.

CC Say again there, Gene.

CDR-EVA I brushed them and tapped them yesterday.

CC Okay; copy that. You might want to put the big bag on the inside of the pallet there, if you can't operate them.

CDR-EVA Okay.

LMP-EVA Okay; mag Kilo goes on the 500; is that correct? *** got Mary and Franny and Nancy - and Donna - and Bobby and - -

CDR-EVA Jack, I'm also going to keep this in there - -

LMP-EVA - - Karen.

CDR-EVA - - because it's too hard to get off the front end. We'll find a place for that in there.

06 17 11 48	LMP-EVA	Well, okay.
	CDR-EVA	*** too hard to get off the front end. Okay; let's see. Big bag to gate, dustbrush to - Let me get that big bag on the inside of the gate if I can. Inside the gate or the pallet, Bob?
	CC	Inside the pallet. My - my fault there.
	LMP-EVA	That - that's - the pallet, the pallet - -
	CDR-EVA	Yes.
	CC	And if you open the pallet, be careful of the clamp. Probably, if it's feasible, we suggest you reach across in front of the pallet. Reach across the pallet to do it instead of opening it, because of the clamp on the fender.
06 17 12 19	CDR-EVA	It's not feasible. It's not feasible to do that. I got to open it, plus our hook is - over center.
06 17 13 35	CDR-EVA	You know, Bob, how that pallet locking hook can - can be out of the little C-shaped *** in there? It is.
	CC	Oh, boy.
	CDR-EVA	I noticed that yesterday.
	CC	Jack, when you get done with the ETB there, you might save the gray tape out. We're going to use a little bit of that on the SEP when you get done.
	LMP-EVA	When are you going to do that? What am I supposed to do, stand - well -
	CC	We'll turn the - both - We'll turn both switches on when you're out at the SEP transmitter.
	LMP-EVA	Well, the tape is in the CDRs seat, and it'll still be there.
	CC	No, we'd like to take the tape from the CDRs seat and use it on the SEP, right now.

	LMP-EVA	Okay. You want me to do it or Gene to do it?
	CC	Why don't you do it since the tape is there. No, let's - let's let Gene do it. Doesn't really matter. Whoever wants to.
	LMP-EVA	Okay, we'll get it.
	CDR-EVA	Okay, Bob, the big bag is on the inside of the - the ***
	LMP-EVA	... it through.
06 17 14 29	CC	*** copy that.
	CDR-EVA	The - And I know why. ...
	LMP-EVA	These aren't clamped now - -
	CC	Copy that.
	LMP-EVA	...
	CDR-EVA	Okay. The big bag is on the inside, though.
	LMP-EVA	Yes, but it's - also in the way. ***
	CDR-EVA	Sure is. Wait a minute. Wait a minute. Don't close it.
	LMP-EVA	Want me to get out of the way?
	CDR-EVA	I'll open it. *** that locking device. Okay. Let me just see what we got to do here. Okay. *** bag, dustbrush, *** 7 *** mount 20-bag dispenser on commander's camera, *** dispenser to the LMP, *** cap dispenser to the gate.
	CC	And, Jack, are you going out to take the pan now?
06 17 16 14	LMP-EVA	Well, as soon as I finish up here, *** do that.
	CC	And after you take the pan, we'd like you to retrieve the cosmic ray experiment. They're expecting a little solar storm, and before the rain gets on the cosmic ray experiment, they'd like to retrieve it. We'll leave it in the ETB during the traverse.

	LMP-EVA	Okay, after the pan. All right. Gate's locked.
	CC	It will just be a nominal retrieval and we'll put it in the ETB.
	LMP-EVA	Okay.
	CC	*** the gate.
	CDR-EVA	Okay. *** SCB-7 *** dispenser goes on my camera when it gets back. *** can *** the LMPs seat. *** I'll just go ahead and mount some of these bags on your camera while I'm here.
	LMP-EVA	Okay.
06 17 17 39	CC	Gene, if you got time there with the camera, why don't - when you get done with the camera, how about getting some gray tape and we'll put you to work on SEP for about a minute.
	CDR-EVA	*** receiver? Stand by. Let me finish with SCB-7 here.
	CC	If you get - - Okay. And did you get Jack's camera fixed last night? I didn't hear.
	CDR-EVA	Yes, we did. Okay. There is already one on the gate. *** one there. Okay; SCB-7 to gate, *** commander's - camera, we'll do it when I get back - 20 bags on the LMPs camera, core cap dispenser to gate - there's one there, there's one under the seat - short cans under the LMPs seat. I got to put that cap dispenser on him, I got to get my rammer, hammer - Hey, Bob, what bag do you want on the LMP? Do we have 8 here? *** it'll be - -
	CC	Stand by. I think 8 went in; either 4 or 6. No, excuse me; either 5 or 4.
	CDR-EVA	Okay. We'll put either 4 or 5 on there. Okay. I'll have to wait until he gets back. What do you want? Or let me give you TGE reading and get that out of the way and then I'll work on your SEP.
	CC	Copy that.

CDR-EVA ... 27, 001; that's 670, 027, 001.

CC Copy that, Gene. Thank you.

CDR-EVA *** wrinkled up in the Sun a little bit last night.

LMP-EVA Okay -

06 17 20 15 LMP-EVA MARK it. The cosmic ray is terminated.

CC Copy that.

LMP-EVA And, Bob, I took two 5-foot stereopairs of the configuration.

CC *** stick it in the ETB and just hang it there.

LMP-EVA And in case you're wondering, and so you don't confuse it with a rock, it's in bag 106.

CC Copy that.

CDR-EVA Okay. What do you want done to the ***?

CC Okay. Take some gray tape over to the receiver, Gene. And with reference to the fact that the - there is some Velcro missing on the front there which hold the covers down, we'd like to tape the two covers together - on the - in the middle there - you know, where the two - two sides overlap in the middle of the box. Tape those two together. A short piece about an inch long should do it if they are clean.

CDR-EVA Well, I doubt if the tape will stick because it doesn't on ..., but I might be able to go over it with one piece to clean it and another piece to tape it.

CC Okay. And the question beyond that, is there Velcro to hold one of those flaps down or not?

CDR-EVA No.

CC Okay, so both pieces - the Velcro is missing from both flaps, I take it.

	LMP-EVA	Bob, what happened was that the tape that held the lower Velcro on there apparently came loose, and it stuck to the upper Velcro.
	CC	Okay. I understand that. In that case, we'd like to take a piece of tape and tape the cover down to keep it closed when it's not - when it's supposed to be closed. The feeling is that if the cover flaps partly open, you may get specular reflection off the inside of the Mylar down onto the mirrors causing it to heat up during the drive when it's supposed to be closed.
	CDR-EVA	*** we'll give it a try.
	CC	Okay; thank you. And, Jack, if you're done, you might go rescue EP number 5 from the footpad, and we'll put it under the LMPs seat.
06 17 22 43	LMP-EVA	Well, be a lot of other things under there. Okay. I'll rescue it; we'll see where the best place to put it is. Hey, I got - I got bags on you - -
	CC	Okay.
	LMP-EVA	I got bags on your camera, Geno.
	CDR-EVA	Okay; thank you.
	LMP-EVA	*** we're going to put *** two bags on the rear there on our PLSSs?
	CDR-EVA	Yes, let's put those two on.
	LMP-EVA	Okay.
	CC	One of them will go on your PLSS - The one under LMPs seat will go on the CDR, the one with all the stuff in it.
	CDR-EVA	Yes, I got core tubes in 7 here, Jack. We'll put either one of those on - -
	LMP-EVA	Okay. So I can put the charge under my seat.
	CC	That's affirm, I think, Jack, once you get SCB-7 out of there.

LMP-EVA Yes.

CDR-EVA I feel like a kid stuck in taffy.

LMP-EVA Sure is strange not to see some fine-grained rocks out here. Seen a couple but certainly not very many. That rock that you picked up at - *** doing up there? Okay.

CDR-EVA *** that'll hold it down. I hope it solves the problem.

CC ... Dr. Strangelove.

LMP-EVA Okay.

CDR-EVA Well, probably not any more than we would like to see it solved.

LMP-EVA Bob, *** Gene, your bag's going to have two lowers and one upper.

CC Did you re-sort things there, Jack?

LMP-EVA What's that? *** think 7 got - -

CC Did you re-sort things in SCB-7? I was told - -

LMP-EVA *** Go ahead. Go ahead.

06 17 25 44 CC Okay. Our understanding was there were two uppers and one lower in bag 7, and two lowers under the LMP seat. Did you re-sort things there?

LMP-EVA Do you want - how do you want them?

CC It doesn't matter to us. I just wanted to make sure that we know what you are so we don't let you get away too far with two uppers and a lower. Two lowers and an upper is certainly better than two uppers and a lower.

06 17 26 04 LMP-EVA Okay. It's two lowers and an upper.

CC *** we know what it is.

LMP-EVA Two lowers and an upper.

CC *** that.

LMP-EVA *** I'm confused.

CDR-EVA Okay. When you're ready, I'll configure you.

LMP-EVA Okay, here, let me - let me get this on you first since I got - -

CDR-EVA Okay.

LMP-EVA ...

CDR-EVA *** down in a hole now.

LMP-EVA That's beautiful. *** Tallest man on the Moon right now. Okay, that's done.

CDR-EVA Okay?

LMP-EVA Just a second. *** close the cover. *** very good cover. Okay.

CDR-EVA Okay, Bob, I'm going to put SCB-4 on Jack.

CC *** there, Gene. SCB-6? SCB-4; copy.

CDR-EVA SCB-4 will go on Jack. Jack, I got to get these *** straps, too. Did you get mine? *** harness release straps?

LMP-EVA No. Let's do that. I saw them as you go out, and then I forget about them.

CDR-EVA Yes. Okay, yours is on over here.

LMP-EVA Okay.

CDR-EVA Probably a better time to do them, anyway, rather than when we go out. *** get the bag. *** get the other one when I configure your other side. ...

LMP-EVA *** out here today. *** on the hands. Okay.

CDR-EVA Okay, stay right where you are so I can get this. *** come over here, and I'll get you a core cap dispenser, which I left here. Okay, you got SCB-4, you got the cap, you got the rammer, I'll take the hammer. You got the - That's all you need. *** is on the LRV. Okay, what transport - what charge you got there, Jack?

LMP-EVA Five is under my seat.

CDR-EVA Five, okay. You got 5 there, *** got 2 and 3 on the Rover, LCRU blankets are open 100 percent, *** covers are closed. I want to - push that battery cover over there down just to make sure it goes down.

LMP-EVA The warning flag is up ...

CDR-EVA It's probably that - Already, huh? Yes. ... down on there.

LMP-EVA Rover - Rover warning was up.

06 17 30 07 CDR-EVA *** right there.

LMP-EVA It's down.

CDR-EVA *** at that gage again, but the gage on the high battery looked like it may have failed. Okay, *** blankets are open, *** covers are closed and pushed closed, dust LCRU -

LMP-EVA I'm going to the SEP.

CDR-EVA Wait a minute before you do. You got a second? Just come over here by the left front wheel. I know you got a second. Just a little bit closer to the left front wheel, towards me. Oh, that's good, anywhere in there. *** - likewise? *** hold it with that other camera? It's already set at 30.

LMP-EVA Okay.

CDR-EVA And you might want to take a couple of closer ones. A couple at 7 or 11, I'm not sure which. *** gets in it. Yes, it's in.

	LMP-EVA	*** okay, *** head on out.
	CC	17, Houston. We think somebody lost their comm there. Jack, it's probably Gene going to zero.
	LMP-EVA	No, we're with you.
	CDR-EVA	No, sir. I'm here.
06 17 32 01	LMP-EVA	*** read us, Bob?
	CC	I can read you now.
	LMP-EVA	Bob, do you read Gene?
	CC	Reading you, Jack. I haven't heard Gene yet.
	LMP-EVA	*** Gene's calling you.
	CDR-EVA	How do you read me, Bob?
	CC	Okay, read you now.
06 17 32 22	CDR-EVA	Okay, I didn't do anything. I just jiggled my MODE switch here. Okay, we got 2 and 3 on the EPs, plus one under Jack's seat. LCRU blankets are opened 100 percent; battery covers are closed; dustbrush, I've got; TGE, I've got; mags and polarization filter is taken care of; and I'm ready to traverse to the SEP.
	CC	*** We understand TGE stowed and you're taken care of in the comm. And you might give us a Rover read-out either now or when you get to the SEP.
	CDR-EVA	Okay; we'll see which is convenient.
	CC	*** is probably more convenient while you're sitting there waiting for the nav to warm up or initialize - waiting for us to give you the reading.
	CDR-EVA	*** your TV. *** switch is 1.
	LMP-EVA	Hey, Bob, are you watching LMP?
	CDR-EVA	Not anymore he isn't. I took the TV.
	LMP-EVA	Oh, okay.

CDR-EVA Bob, you still read?

CC *** loud and clear. We're now watching the LMP.

CDR-EVA Okay, I just wondered because I just took the TV. I just want to make sure we got comm here.

CC *** in MODE 1.

CDR-EVA And, for your information, we both got our cover gloves off. ... can't read down there.

LMP-EVA *** the old tape fix on the SEP's still working. There's a little - -

CC Beautiful.

LMP-EVA Both mirrors have a little angular displacement but not more than 5 degrees.

CC *** that's the least of the SEP's problem, but we have hope.

06 17 34 59 LMP-EVA Okay, you're going to be over there, huh? I'm over here.

CDR-EVA I don't believe this.

LMP-EVA What's the problem?

CDR-EVA Oh, nothing. That roll indicator isn't worth a dingdong ... roll 10 degrees.

CDR-EVA Okay. Roll zero, *** is zero; heading is 291; distance, 001; range, 000; amp hours are 90 and 85; volts are 65 65; Sun shadow device, by the way, is 0. Batteries are 100 and off scale low, and motors are all off scale low.

CC Okay; and, Gene, we'd like to torque to 287, 287.

CDR-EVA Okay; in work. Let's see, 287. That's a heading *** City to Tindall. Okay; 27 28, 287 right on the money.

LMP-EVA Bob, 45 - -

	CC	Copy that, Geno. And - -
06 17 36 29	LMP-EVA	45 Yankee is a sample - sample from near the SEP.
	CDR-EVA	Boy, I tell you, Jack. That was all cut out.
	LMP-EVA	Oh, well. I got the sample, anyway.
	CC	*** 45 Yankee near the SEP. That's all we have. If you give us a frame count when you get done, and give us an approximate location for the Rover, at least crosswise from the Y, we'd appreciate it. And we also need SEP receiver power and DSEA both on. And we'd like the cover taped back - taped down when you get done, Jack.
	CDR-EVA	Okay, Jack, keep me honest on those rilles.
	LMP-EVA	Okay; you're okay now. Let me get over on the rille. I don't see -
	CDR-EVA	See me?
	LMP-EVA	Come on. You're good.
	CDR-EVA	Oh, there's the SEP. Wait - did I miss this other rille?
	LMP-EVA	Yes. There's the - I'm on the antenna.
	CDR-EVA	What about the one coming west?
	LMP-EVA	That's what I - No, you're okay on the one west - you're way away from it.
	CDR-EVA	Okay. *** look back.
06 17 37 54	LMP-EVA	You want to look - head towards the SEP. You're okay.
	CDR-EVA	Oh, I see it now. Okay.
	LMP-EVA	Head towards it and then turn - then make your turn.
	CDR-EVA	I see it. I'll go over to it.

	LMP-EVA	Matter of fact, turn on these tracks.
	CDR-EVA	Yes. I'm in good shape. I see it. *** it.
	LMP-EVA	Bob, that 45 Yankee was a fine-grained ...
	LMP-EVA	... ... 2 meters to the west of the north line.
	CC	Copy that.
	CDR-EVA	And I guess I'm certainly within 5 meters of the transmitter.
	LMP-EVA	Yes, you're in good shape.
	CC	We'll get that in the photos. And, Gene, how's the low gain located - oriented?
06 17 39 05	CDR-EVA	It's oriented 355 and my heading is 352.
	CC	Okay; copy that.
	CDR-EVA	Okay; you want the receiver on ***
	LMP-EVA	*** and taped down again, huh?
	CDR-EVA	Yes, I put ...
	CC	Roger. Both - Roger. Both the receiver and the recorder on, both switches on and then tape the cover down.
	LMP-EVA	Good luck.
	CDR-EVA	... ON.
	LMP-EVA	Okay, it's taped down more or less.
	LMP-EVA	And then I guess I'm supposed to get on, huh?
	CC	Thank you.
	CDR-EVA	Hey, Bob, the NAV RESET has been - -
	CC	Roger on that.
	CDR-EVA	NAV RESET is ...

	CC	*** you guys to roll.
	CDR-EVA	Okay, what's the first range and bearing to the Rover sample, past Jones?
	CC	Okay, it will be 185 and 1.5 on the range.
	CDR-EVA	185 and 1.5. 185 and 1-1/2. Okay.
06 17 40 44	LMP-EVA	Excuse me, Gene.
	CDR-EVA	No problem.
	LMP-EVA	Well, shoot. I've forgotten how.
	CDR-EVA	Boy, that Challenger looks pretty from here, you know it.
	LMP-EVA	Yes. Okay, I'm on.
	CDR-EVA	Okay.
	LMP-EVA	Did I want a charge? No.
	CDR-EVA	No.
	LMP-EVA	Okay.
	CC	No charge, Jack; no charge.
	CDR-EVA	Got it. Got it; 185 and 1.5 and I'm going to head on at about 012. We ought to go right through Jones. *** Davy Jones.
	CC	Okay; and, Gene, remember the driving fairly slow - or fairly well controlled the first 300 meters, and a mark at the end of the antenna.
	CDR-EVA	*** Jack, watch that antenna lean - -
	LMP-EVA	Uh-oh. Keep ***
	CDR-EVA	*** you?
	LMP-EVA	Okay so far; keep going. Okay, let's do that again - -

CDR-EVA Yes.

LMP-EVA *** different.

CDR-EVA I'll pick up that same spot. I can see right where I was.

CC Give us another mark when you start up from that spot.

CDR-EVA Okay. We'll give you a hack, Bob.

LMP-EVA *** little - -

CDR-EVA Yes, I'm right on the track. Same tracks exactly.

LMP-EVA Well, okay.

CDR-EVA That's exactly - I just came right over. Okay, we're starting, Bob -

06 17 40 34 CDR-EVA MARK it.

CC Copy that.

CDR-EVA We can't go too far in this heading. We've got a big hole up here. Like a big one.

LMP-EVA Wonder if that's Rudolph?

CDR-EVA Well, let's see, this is east - looks awf - it's a double crater but it's much bigger than I thought Rudolph would be.

CC No, if you're where you think you are, you're beyond - you're east of Rudolph quite a ways.

CDR-EVA I think you ought to know where we are by now, Bob.

LMP-EVA *** that's Lewis and Clark.

CC *** that. After you give me a mark there, we'll give you - I'll talk to you about it.

CDR-EVA I'm sorry, Bob. I guess you - you didn't hear it. I - we're passed the *** the antenna and we're headed south or north - northeast. *** screw you up?

	CC	Okay, I - - Did you give me a mark when you started or a mark when you passed the antenna?
	CDR-EVA	I gave you a mark when I started and it took about 20 seconds to get to the end.
	CC	Copy that.
	CDR-EVA	Is that good enough or do you want me to go back?
	CC	No. No. Press on. And, Jack, if you look at your contour map there, we think you are located right now at approximately where the P in SEP is, just below the P in Poppy.
	LMP-EVA	Okay.
	CC	In which case you're probably driving through that little crater that's just to the northeast there. That's probably the one you came upon.
	CDR-EVA	*** very little, though.
	LMP-EVA	Okay, Bob. *** wish I could *** bit better.
06 17 44 57	LMP-EVA	The major boulders still look like the - the pyroxene gabbro. *** texture has not changed. There is a - there is a granule population, now that I look at it more closely, with the shadows. But I have a feeling that most of those are - they look like they're just small, very small clods. That should show up in some of the bulk samples we've taken. It is remarkable to me the - only a small number of fine-grain rocks. There's one at about halfway between the SEP and the LM that I'd like to pick up. It's a fairly good sized one. Maybe we can get it when we get back. It looks like a fine-grained basalt. ...
	CDR-EVA	Well, I tell you, it's not exactly the greatest place to navigate through.
	LMP-EVA	...
	CDR-EVA	...

06 17 46 10 LMP-EVA There's still - there's a crater we're just passing at 207.4 *** meters in diameter, with the pyroxene gabbro blocks on the rim, few of them. It's not an exceptionally blocky rim crater, but we are in an area where the block population is up to about 5 percent in contrast to most of the area we traversed yesterday.

CDR-EVA I tell you, *** a little bit rough; there's a population of blocks, as Jack said, and there is an awful lot of small craters.

LMP-EVA Yes, I was just going to add that the frequency of ...

CDR-EVA ...

LMP-EVA ... although not exceptionally blocky rim - they all have a slightly, maybe *** 3 or 5 percent more blocks in their walls and on their rim than do the - does the normal terrain.

CC Roger, Jack. Copy that.

LMP-EVA Still no *** structure within the dark mantling material itself.

CDR-EVA Bob, you said 185/1.5?

LMP-EVA What do you want?

CC That's affirm.

LMP-EVA For the Rover?

CDR-EVA Yes, for a sample.

LMP-EVA Oh, they changed it on us. Okay. ...

CC That was after the SEP photos, right?

LMP-EVA That's affirm. ... before the SEP photos.

06 17 48 37 LMP-EVA Okay, Bob, looking up at the North Massif, we see the scattered, strewn field of boulders, that generally seem to start from a - more or less, from a line of large boulders, which might indicate some structure. And those lines are roughly

horizontal across the face that we're looking at. The boulder tracks are ... that they are curved in places but they're all - that I see - tend to be aggregates of little craters - where the boulder was obviously tumbling and bouncing a little bit. *** out in population of fragments now in the immediate area *** is generally about 1 percent between craters. But at the crater rims, it's up to about 5 percent. And these craters - -

CC Okay. Copy that, Jack. And how far down the North Massif is the line of boulders?

LMP-EVA Oh, there are several of them, Bob. What I'm talking about is about 100-meter-long lines *** boulder trains initiate and they are - there's one about - looks like about halfway - maybe two-thirds of the way down in perspective. Another one that's probably about halfway and then - they're just sort of scattered around on the Massif. I think we're getting close to - No, we couldn't be.

CDR-EVA I've got to more over here a little.

LMP-EVA That must be Jones.

CDR-EVA *** looking?

LMP-EVA Off to the right.

CDR-EVA Yes, our heading that they're sending us down here, it really should put us to west of Jones. So that's about right. *** static in the background today.

06 17 50 51 CC ...

CDR-EVA ... BORE.

CC Copy that.

LMP-EVA Okay.

06 17 51 22 CDR-EVA 187/1.1.

CC Copy that.

LMP-EVA Bob, I wish I could give you more on that structure in there, but I think those lines of boulder sources are about all we can see right now. Talked about the lineaments yesterday and they're not nearly as obvious today in the higher Sun. Looking up Wessex Cleft - even with the Sun in the flat area there, it looks darker than where - than the North Massif side. But again, the Sun angle may be fooling us but as I recall, it was darker on the photos.

CDR-EVA The old man wrinkled face on the - -

LMP-EVA Sculptured Hills.

CDR-EVA - - Sculptured Hills, though, is evident as soon as you come out of the - out of Wessex Cleft.

06 17 52 20 LMP-EVA Yes. And it looks like there are boulders up on the side of Sculptured Hills, except that they aren't nearly as big as those on the North Massif. The areas where the boulder source is look like they're made up of boulders no bigger than a meter maybe; whereas, the North Massif boulders are up to several meters. *** boulder sources all seem to be up within a third of the height of the Sculptured Hills, just south of - just east of the massif *** Wessex Cleft. Here is a boulder track that crossed the slope. ***, Geno?

CDR-EVA Yes - yes. I sure do now.

LMP-EVA It looks like it goes, rather than perpendicular contours, it probably is crossing them in a fairly straight line on an angle of 60 degrees, maybe.

CDR-EVA Back to the east.

LMP-EVA Yes, to the east. That one may be fairly near - -

CDR-EVA Jack, see that big boulder with that big track - it looks like it's an elongated rolled-up boulder. Look at that.

LMP-EVA Yes, it does. Looks like it ...

CDR-EVA Okay; here we are, 1.5 and 185.

LMP-EVA Is this a Rover sample or - -

CDR-EVA Rover sample.

CC Okay; copy that.

CDR-EVA Okay, show me where you want it.

LMP-EVA Okay. See that little pit right over there? About - about 30 feet ahead.

06 17 53 44 CDR-EVA Yes, I think so.

LMP-EVA I've got two pictures there. *** great. Okay. This is soil sample ***

CDR-EVA And I just took a locater, and CDR is on frame 41.

LMP-EVA Got it?

CDR-EVA No, not yet. *** now.

CC *** Gene.

CDR-EVA 46 Yankee. *** open?

LMP-EVA Yes.

CDR-EVA Okay; it's in. We ought to tape that ... I'll get it. That thing came down - came off that piece of Velcro *** when I get back.

LMP-EVA Okay. And LMPs frame count *** is 35 ...

CC ... that Crater Henry, that large block there near the break in slope, which is our next aiming point, the bearing range there is 188 and 2.8.

06 17 55 17 CDR-EVA Okay; 188 and 2.8. Roger.

CC And, Jack, what do you see in the way of boulders coming down to the base of the Sculptured Hills in terms of sampling opportunities at station 8 and in terms of any boulder tracks that we might -

might lead down the boulders that might just possibly be accessible at station 8.

LMP-EVA Watch it, Gene. Boulder tracks are not obvious on the Sculptured Hills at all. It looks like there are fragments over there. *** would have their sources higher up the slope. I think we can get boulders there. But we'll have to get a little closer, Bob.

CC Copy that. And we'll see you in a couple of hours. We'll find out in a couple of hours.

05 17 56 17 LMP-EVA Yes, I'll give you a reading on that before long. I wouldn't eliminate station 8 for the world or the Moon, whatever's available today.

CDR-EVA *** did you say - 188/2 point something.

CC 2.8.

CDR-EVA Okay; thank you. See that big boulder, Jack, with those tracks?

LMP-EVA Yes, it looks like - -

CDR-EVA That's a funny looking boulder.

LMP-EVA It looks like it may have stopped rolling because it broke up. *** broken to me now.

CDR-EVA ...

LMP-EVA ...

CDR-EVA ...

LMP-EVA ... Okay, you've got yourself in some holes here. You've never - I've read you all along, though, so there's no problem. Okay, there's a big crater. I haven't recognized Jones yet. *** you're getting up on the rim of Henry here.

CDR-EVA Yes - no, Henry should be to - I'm well - should be well west of Henry, I think. *** be surprised if Henry isn't right over that little rise on the right.

	LMP-EVA	Bob, the surface structure hasn't changed texture. We're on a little bit of a rise in here now and still about 1 percent of the surface - -
06 17 57 46	CDR-EVA	There's Henry right there, Jack.
	LMP-EVA	There's Henry. I thought you were close to Henry.
	CC	How about a range and bearing.
	CDR-EVA	188/1.8.
	LMP-EVA	And we're just southwest of Henry. On the rim.
	CC	Copy that.
	LMP-EVA	Prince Henry the Navigator.
	CDR-EVA	Watch that foot.
	LMP-EVA	*** a wheel, I think. And Henry looks much like Horatio did. Has boulders on its inner wall - not as many. They look light colored - a light albedo gabbroic appearance. There may be some right down there, though, that are fine grained; they look a little grayer.
	CDR-EVA	Jack, there's our target - there's - either one of - that's one right down there on - on ... break in slope.
06 17 58 39	LMP-EVA	See the one we've got over there has a boulder track. That's the one, that cross-slope.
	CDR-EVA	Yes, if we could get - That's awful high.
	LMP-EVA	Can we get up there?
	CDR-EVA	We'll see.
	LMP-EVA	That's the one - That's station 6, and that was the - the turning boulder.
	CDR-EVA	Yes, that's it.
	LMP-EVA	The one right there.
	CDR-EVA	*** station 6 - we can probably get up there.

LMP-EVA Yes, I think we can; it doesn't look too bad. ... right now, doesn't show anything obvious, except that's where the boulders start. And on up the hill you have ... -

06 17 59 06 CC Okay. We hope that's fairly obvious.

LMP-EVA But as I was saying, Henry just looks like a somewhat more mantled Horatio (laughter). *** ridiculous.

CDR-EVA Say, Bob, I'm navigating - headed northwest now - to get around the western rim of Henry.

LMP-EVA And on that west rim, we've got - -

CC Okay.

LMP-EVA - - about 10 or - 10 percent boulder cover.

CC Okay. And a reminder, Jack, to keep taking your Rover photos.

LMP-EVA Yes, sir. And when I - By boulder, I generally mean fragment, Bob, in this case. When I say 10 percent, I'm looking at stuff greater than about a centimeter in diameter. I'll try to say fragment from now on and be more precise. ... or boulders on them up to 2 or 3 meters. But, again, they all appear to be buried. There are very few, except small ones, sitting out on the surface.

CDR-EVA *** the fragment population out here only goes out to maybe 200 meters, I expect.

LMP-EVA Okay. Now this concentration of boulders is because of a 50-meter crater in the rim of Henry. I think that was one we - -

CC Okay, that sounds like Locke. How about a range and bearing.

CDR-EVA Take a picture in here, Jack.

LMP-EVA No. Locke, I can see. *** the picture.

LMP-EVA Okay. That's not - Yes, Locke's right ahead of us.

LMP-EVA Yes. This is one on the - about 50 meters right on the rim crest of Henry, almost due - the west rim - due west rim. Now Locke is just ahead of us. It also has boulders in its walls but has relatively few on the rim. Characteristic of both Henry, Locke, - -

06 18 01 18 CC Okay. Copy that.

LMP-EVA - - and Horatio is a re - essentially no change in the average frequency of boulders on the rim. The increase comes in the wall.

CDR-EVA We're at 184/2.3. We're just about between Henry and - Locke. Yes; right between them.

CC Okay. I copy that. And you guys are heading for that big boulder, which must be just dead ahead of you there, about half a kilometer.

LMP-EVA Well, we're - Gene's sort of headed for station 6 now.

CDR-EVA I'm going to take a tour around that boulder and get a case on it.

LMP-EVA Okay. Go ahead.

CC Yes. That would be a good mark to give us a range and bearing on, since that's a pretty good straight point.

CDR-EVA Yes, we are.

06 18 02 05 LMP-EVA Bob, the boulder concentrations in the wall of Henry have their upslope start at about - oh, I would guess an average of 30 meters down from the rim crest. The rim crest of Henry is not very well defined, but it's there. And they - from that initiation of boulders, they stream down the slope to the break in - in slope down at the floor. *** no obvious change in the dark mantle, as we're just to the east of Locke now. There's some - there's a 30-meter crater, fairly subdued but still quite deep - subdued rim. Again, it looks as if it were mantled; that *** no significant increase in blocks on its rim. That crater, in

any other place, would have been a very blocky-rim crater. It has - it's maybe 30 meters and - by 5 meters deep. Man, that is a big rock up there. Turning Point Rock is a split rock ... overhang, with another block just this side of it ... pyramid shape in cross section - triangular shape in cross section. And it looks like it is pretty well fractured, although not pervasively like the rock at Shorty was.

CDR-EVA Okay, Jack, I know I can get up to that - to station 6.

LMP-EVA Yes.

CDR-EVA I might drive up there.

LMP-EVA Yes. Now, Bob, station 6 rock - one of them - is from that boulder track that runs obliquely across the contour.

CC Okay. I copy that, Jack.

LMP-EVA And there's - the pictures ought to be able to - -

CC Sounds like good news.

LMP-EVA The pictures ought to pin down its - at least the end of the boulder track pretty well.

CDR-EVA Boy, this is a big rock, Jack. Whew!

06 18 04 33 LMP-EVA As I recall - As I saw it, the boulder tracks stopped about halfway up the slope of the North Massif. That is a big rock.

CDR-EVA We're at Turning Point Rock. And it looks like it's - I don't know if it's mantled on top, but it's certainly filleted. There's a - a lot of the dark mantle up and on some of the shallower slopes of the boulder. And it's on a little mount itself, as if much of it might be covered up.

LMP-EVA Yes. Okay. It looks like a breccia from here.

CDR-EVA Can you get a sample of it right here? You see these little chips?

LMP-EVA Yes, I probably can.

CDR-EVA ... and 2.8.

CC Roger. Copy that. Sensational.

LMP-EVA Okay. You got to - can you drive up - -

CDR-EVA Yes.

LMP-EVA - - to the - *** there, let's see - no, I can get them. The thing is, I don't know what it is.

CDR-EVA Well, but ... it's part of these fragments around here. ... 5, 6, - 6 meters high anyway. It's a - Well, I'd say it's a very rough subrounded type of rock *** face - Let me get this, Jack. Okay.

LMP-EVA There are two fragments in that sample.

CDR-EVA 47 Yankee.

LMP-EVA Plus some dirt. And it's about *** meters from the - Turning Point Rock on the north side.

CC Okay. Copy that. And presume you got some good photos of the rock.

06 18 06 16 LMP-EVA Yes, I got a couple. I hope they're good.

CDR-EVA Well, I'll tell you what I'm going to do here, real quick.

LMP-EVA And my locator is - -

CDR-EVA I'm going to do a - -

LMP-EVA - - 5, 6.

CDR-EVA Jack, let me spin around this little crater here to the left.

LMP-EVA Bob, it looks - It's very coarsely vesicular; but, at first glance, it did not look like the pyroxene gabbro - although the rock - that rock does. I - It looks like it might be fragmental, although I'm suspicious that I'm looking at zap pits. ... nice view.

CDR-EVA And we're on a little rise looking at this boulder. That's incredible. Okay. We're on the roll, Bob.

CDR-EVA You know that - -

CC Copy that.

LMP-EVA Bob, my guess is, right now, is that Turning Point Rock is a big piece of subfloor gabbro.

LMP-EVA What looked like fragments is just - -

CC Okay. I gather you changed your opinion.

LMP-EVA What looked like fragments is just big spalls - spalls of where the zap pits have cleaned off the rock.

CC Okay. I copy that. And, guys, you might be happy to know that we think we've finally found the LM, because we were calling that for 188 and 2.8, and you got there at 186 and 2.8.

LMP-EVA That's not bad. Okay - -

06 18 08 05 CDR-EVA It's a split one up there, Jack. I've had my eye on it. There's some big boulders down here.

LMP-EVA *** I sort of lost track of station 6.

CDR-EVA Now, I got it. I've had my eye on that boulder. You can't see the track from here. I'll bet you can. I can see it now. We'll see it - we'll be looking right up it - looking right up the old boulder track. Man, I tell you, this navigating through here is not - -

LMP-EVA Okay. We're in a region where the really - The general fragment population is no different. We're up on the - off the break in slope, although you wouldn't notice it - but we are quite a ways. And the *** fragment population is not much different than that on the plains. The big difference is that there are these scattered blocks that are from a meter to probably 10 meters - no, 5 meters in diameter. *** say, maybe 8.

CDR-EVA See that track coming down? We'll be looking right up that track.

LMP-EVA Yes, yes, you got it. I didn't realize you were that far upslope.

CDR-EVA Yes, we're way upslope.

LMP-EVA Yes. *** it.

CDR-EVA Not very uncomfortable for me on this side. (Laughter) How do you feel?

LMP-EVA Oh, I feel fine. I just - until I looked down there and saw the slope we're on.

CDR-EVA Yes, I know it.

LMP-EVA And I can't see any obvious change in albedo, like we could see with the light mantle yesterday. You - you - You got a - don't - There you got a nice - nice place. Oh, oh, you don't want to go over that way.

CDR-EVA I can make it. *** park right - -

LMP-EVA I'm surprised you didn't high center with that one.

CDR-EVA No, that - okay - -

CC And, 17, you want to park at a heading of 107. We're going to open the battery covers and let them cool at the station. *** 107.

CDR-EVA 107, huh? Okay. I'll get it up here.

LMP-EVA Hey, that's going to be moderately level right there.

CDR-EVA Yes.

LMP-EVA Trouble is, they're looking into the shady side of the block.

CDR-EVA Well, if I park on the other side, they won't be able to - I can go right upslope a little bit.

	LMP-EVA	That's all right. We can work in there. No, that's all right.
06 18 10 32	CDR-EVA	Yes, I can't go up there. Let me just - This is going to have to be good. I can't go up there.
	LMP-EVA	I think you're all right.
	CDR-EVA	That's not very level, but - -
	LMP-EVA	Oh, not too - not too hard. Watch that turn.
	CDR-EVA	*** very level, but we're not going to get much more level than that.
	LMP-EVA	Oh, that's good.
	CDR-EVA	*** they wanted 107. *** best I can do. That's not very level for the gravimeter, but - Let me see if I can get comm. Hey, Bob, how do you read?
	CC	Loud and clear, 17. How do you read?
	CDR-EVA	Okay. We're parked on a heading of 107. Are you happy with that?
	LMP-EVA	(Laughter) You parked on a slope, too.
	CDR-EVA	There's no level - -
	CC	Roger. Sounds great.
	CDR-EVA	There's no level spot to park here, though.
	LMP-EVA	You want me - some help getting off?
	CDR-EVA	I've got to go uphill.
	LMP-EVA	I just about endedup down at the bottom of the hill.
06 18 11 43	CDR-EVA	Okay; 192/3.8, *** .1; 88 and 80; *** 08 and 0 on the batteries. The forward motors are 220 and about 270, and the rears are 0 off scale low and 220.
	LMP-EVA	You want me to block the wheels? (Laughter) You got the brake on, I hope.

CDR-EVA You betcha. *** if I can lean uphill enough. (Laughter) I can't. Holy Smoley. ...

LMP-EVA ...

CDR-EVA Yes. Let me get this thing set again.

LMP-EVA I don't think you can get up here.

CDR-EVA Boy, are we on a slope!

LMP-EVA Okay. I'm going to stay out from between the rocks. It's a beautiful east-west split rock. It's even got a north overhang that we can work with. And let me see what it is. We're right at station 6. You wouldn't believe it.

CDR-EVA I would. Oh, man, what a slope!

LMP-EVA And this boulder's got its own little track, right up the hill, *** contoured. It's a chain of craters track, and it looks like it starts *** there. We're going to be able to photograph where it started. ... Bob, are you reading us?

CC *** loud and clear, and we got a picture.

CDR-EVA Oh, man, I tell you, are we parked on a slope! I don't know whether your TGE's going to hack it.

06 18 13 34 LMP-EVA Bob, this is a - -

CC It'll take up to 15 degrees.

CDR-EVA Well, it is going to have it.

LMP-EVA It's a coarsely vesicular, crystalline rock - finely crystalline. Looks like a - probably an anorthositic gabbro - trying to see the ...

CDR-EVA Say, Bob, you want both the recorder and the - and the other switch off? ...

CC Roger. Both of those off and the dusted.

CDR-EVA Oh, man, is it hard to get around here!

LMP-EVA Bob, it looks like the glass is fairly light colored. It's not white. Well, no - it's black. It's anorthositic gabbro, rather than gabbroic anorthosite, I think. Yes, that's black glass in the pits.

CC ...

CDR-EVA ...

CC ...

LMP-EVA ... they're flattened. All of them are flattened. There's a strong foliation of vesicles in the rock. Most of them are flattened, and they are up to 15 or 20 centimeters in diameter and about 5 to 6 centimeters thick - or wide.

LMP-EVA And there's some beautiful north overhangs all around the block. Well, (laughter) on the north side of the block.

06 18 16 05 CC Okay. That's the best place - that north overhang; and I guess that means one of you guys might grab the SEC - the small can - before you leave the Rover.

CDR-EVA Okay, Bob. It's going to take me awhile to dust. I tell you - -

LMP-EVA Okay - -

CDR-EVA Hard to get around here.

LMP-EVA Bob, let's get it straight. You w - want -

CC Roger on that.

LMP-EVA Let's get it straight, you want the north overhang sample in the SEC - or the short can?

CC *** miracles. They don't want the short can. I'm not sure I understand that, Jack, but they don't want the short can here, they say.

LMP-EVA Okay. We'll put them in bags.

CDR-EVA Oh, man - -

CC I guess they're looking for volcanics today. They're looking for volcanics today, Jack.

LMP-EVA Oh, they are, huh? We found those yesterday.

CC Well, they're hoping again at station 9.

LMP-EVA This is - *** that foliation I mentioned does not go all the way through the rock. There are variations in texture. One zone was strongly foliated. There's another - it almost looks like a large - it is - a large inclusion of nonvesicular rock within the vesicular rock. There may be some autobrecciation involved in the formation of this thing. It really looks mineralogically like the *** colored samples from the South Massif. But I - I tell you, that's only because it's light colored, and I - I can't give you anymore than that right now, until we get a fresh surface.

CDR-EVA 110 degrees on the SEP and you want the tape - the cover closed, right?

CC Cover open, please. Cover open. Both off.

CDR-EVA Okay. *** open. *** my golly.

CC Okay. And did you get the batteries - the LRV battery covers open? We didn't copy that, Gene.

06 18 18 18 CDR-EVA No, I didn't copy that you wanted them open. I just got 107. I was about to ask you that.

CC Okay. We'd like them open. And, Jack, while I'm interrupting everybody here, how about a frame count, if convenient.

LMP-EVA Oh, shoot! Bob, I gave you one at the rock. It's now 68.

CC Copy that.

CDR-EVA Man, I never - (Laughter) You can't believe how tough it is getting around this Rover, on this slope.

LMP-EVA *** I'll - -

CDR-EVA Man, that - I think we're probably PITCH 20 and ROLL 20.

LMP-EVA ... and get a pan while we're waiting to sample.

CDR-EVA Oh, I got to dust those radiators. I can't leave them like that. *** this is not a very good place to dust them, though. *** try one time. Oh, boy.

LMP-EVA Be careful, Geno. Need some help?

CDR-EVA No. I need a little finesse, though. *** thing to reach over - here and do this on level ground. I don't know if I can do that *** falling on the battery.

LMP-EVA Well, I found a place to stand where I can take a pan.

CDR-EVA Bob, I'm going to have to give you a good battery brushing at the next site. I can't get - I get half of them, but I can't get the other half. *** slopey.

CC Okay. We copy that.

CDR-EVA But the covers are open. What are you working on, Jack?

LMP-EVA I'm taking a pan.

CDR-EVA Very good. I'm coming right now. I *** dollar to doughnuts that you don't get a TGE reading.

06 18 20 34 CC Yes, Gene. If you're - If it's easy enough to take it off, why don't you take it off the Rover; and we'll try and level it in the stuff.

CDR-EVA Oh, come on. (Laughter) I'm not sure there's any place to put it on the ground level.

LMP-EVA No, *** dig a place.

CDR-EVA Yes, I'll do it. Okay. It's coming off. Well, I'll set it right up here.

LMP-EVA It's going to fall down the hill. You'd better stomp off a good place.

	CDR-EVA	Yes. *** level to me. Can you see it from there?
	LMP-EVA	*** see it.
	CDR-EVA	I mean, does it - -
	LMP-EVA	I don't know. I have no perspective anymore.
	CDR-EVA	I don't either.
06 18 21 30	CDR-EVA	MARK. Gravity. ... Okay; now let me get to work. Okay. ... My fender got a little kinked here, which isn't going to help us ...
	CC	Hey, Jack. And we see your gold visor is up. You may want to put it down out here in the Sun.
06 18 21 58	LMP-EVA	Well, I think I might - I can't see with it down; it's scratched. Bob, I'll use it. *** I can monitor that one. Hey, I'm standing on a boulder track. How does that make you feel?
	CDR-EVA	That makes me feel like I'm coming over to do some sampling. Think how it would have been if you were standing there before that boulder came by.
	LMP-EVA	I'd rather not think about it.
	CDR-EVA	Okay; let's go. You got a spot picked while you're here?
	LMP-EVA	Well, the big thing is, let's get those *** the boulder and then get in that east-west split. Bob, I got an undocumented sample from the *** boulder track.
	CDR-EVA	Whew!
	CC	Copy that. Soil sample?
	LMP-EVA	Soil sample. Gene, if you hit them off in there, it's going to be awful hard to find them. That's the problem.
	CDR-EVA	Did you pick a spot - a good spot while you were over here?

LMP-EVA No, I didn't. I just was looking at it. I think we need to get in the light, though.

CDR-EVA I - I can see with my gold visor.

LMP-EVA Let me put a sample in your bag.

CDR-EVA Go ahead.

LMP-EVA It's bag *** 34.

CDR-EVA This boulder looks fairly uniform from top to bottom.

LMP-CDR We've got to get a reference sample out - this soil.

CDR-EVA Let's get where we can get that 90-degree picture, too; so we want to get on the - really ought to get on the Sun side. Let me get that slab right there, though, to start with. I can get that one off. Well, there's no - let's go over on the Sun side because we can't really photograph it.

GET 12:23:58 LMP-EVA Okay. I got to get out of here first.

CDR-EVA Let's go through the split.

LMP-EVA Well, okay. Be careful, though. *** sample the split first so we don't - -

CDR-EVA Look at that overhang. Man, I tell you, if you can get your shovel down there, you'd have a ball.

LMP-EVA Yes, let's sample in the split first *** we don't get it too messed up. And then we can sample some of this stuff. Not - we want this overhang over here, Geno - the north facing one.

CDR-EVA Right here?

LMP-EVA Yes. I got to get - sneak by over there. Whoops! Don't shuffle too much dirt in there.

CDR-EVA Okay. You by me so I can set the gnomon down.

LMP-EVA Not quite. Don't think I can make it - without hitting you. ...

CDR-EVA ...

LMP-EVA ...

CDR-EVA ...

LMP-EVA ...

CDR-EVA Let me set the gnomon down - -

LMP-EVA Set it down just outside the shadow there. Right - Whoa - right there. That's good. There's still some good clean ground there. Okay.

CDR-EVA Okay. I can get back far enough to take these pictures. I want to go get a stereo pan around the corner anyway. *** I can't start here with about 5/6. *** close.

LMP-EVA Okay, I'll get a -

CDR-EVA I must have a boulder ...

LMP-EVA I'll get it. Let me - -

CDR-EVA I'm going to go around the cor - I got it now.

LMP-EVA Okay. You got a bag?

CDR-EVA All set.

LMP-EVA Okay. I'm going to get the shadowed material.

CDR-EVA *** bag 312, Bob.

CC *** 312.

LMP-EVA And it's - it's from - I think you saw where I got it. It's about a half a meter back of the limit of the overhang. Put it down. Put it down.

CDR-EVA Okay. Can you reach it?

LMP-EVA I will in a minute. You can turn it a little bit towards me. Okay; 312. And the soil outside the overhang will be next.

CDR-EVA Okay. Go get it.

06 18 26 55 LMP-EVA And the first one is from the upper *** centimeters.

CDR-EVA Bag 313.

CC *** 313.

LMP-EVA And the second one is from *** down - from 2 centimeters down to about 8.

LMP-EVA Bob, it looks like the fragment just to the - or the boulder just to the south of us has some inclusions in it - ***-colored inclusions.

CDR-EVA Bag 472 on that.

CC Copy 472 on that. You mean the south half of the split boulder?

LMP-EVA Yes. *** seen inclusions in the other half.

LMP-EVA You happy with that, Houston? Let's get ...

CDR-EVA ...

LMP-EVA Got your hammer?

CDR-EVA *** see if I can't get right on top up there.

CC *** happy with that for an east-west split.

LMP-EVA *** little hard, huh? I think - -

06 18 28 00 CDR-EVA I've got to find a corner I can get at.

LMP-EVA Yes.

CDR-EVA *** an after picture down in this hole.

LMP-EVA Oh, that's right. You almost stepped on the - I forgot the after, too. *** chips up here on top. *** that's been spalled off. We can get some of those, but - -

CDR-EVA Looks like somebody's been chipping up there.

LMP-EVA Looks like there's been a geologist here before us.

CDR-EVA Let me get the gnomon. I think I can get some of these pieces over here. *** get that 90-degree angular flight line around this boulder, too.

LMP-EVA Bob, the more I look at this thing - Here's the piece that fell off. Here's the piece that was knocked off up there.

CDR-EVA Yes.

LMP-EVA Look at that.

CDR-EVA We ought to bring a big piece of that home. That's obvious - it's obvious - -

LMP-EVA How about this one up here? Take your picture. I think we can just lift that off. ***

CDR-EVA Stand by.

LMP-EVA I'd better get - -

CDR-EVA I'll get a locator from here.

LMP-EVA *** going to get my down-Sun, but I'm afraid I'll -

CDR-EVA ...

LMP-EVA ...

CDR-EVA ...

LMP-EVA ...

CDR-EVA Just throw it in my bag. *** broken, but it's in place. That's a nice, big piece, too. It's about the size of a - -

LMP-EVA *** put it in mine. I can't get a thing in it.

CDR-EVA Okay. ...

LMP-EVA ...

CDR-EVA ...

LMP-EVA Okay, Bob, there's a big spall lying on the ground here that has been knocked off up there, from right on top of the boulder. And, I tell you, the more I look at this - the south half of this boulder, the more heterogeneous in texture it looks. It looks as if it may be *** recrystallized breccia of some kind, or you had a gabbroic anorthosite - magma catch up an awful lot of inclusions. I guess I prefer the latter explanation because of the extreme vesicularity of the rock.

CC Okay; very interesting.

LMP-EVA Now, some of the - a few of the inclusions are - Well, they're all subrounded to rounded, and a few - And a few of them are very light colored. I'm going to try -

06 18 30 52 CDR-EVA I'm coming around the corner with a flight line ...

LMP-EVA Are you going to do it now? Okay. Well, you know, I ought to get one shot back here with a black and white. I'll get this half black and white.

CDR-EVA Okay, *** could get - -

LMP-EVA I think we ought to pick up a piece of that spall there by the gnomon -

CDR-EVA I can break it off.

LMP-EVA There's one right by the gnomon there we can just pick up. It's a finer-grained vesicular rock than - wait - where - -

CDR-EVA Oh, oh, oh, oh, oh.

LMP-EVA I thought I was going to get this half.

CDR-EVA Okay. I don't care. I've started down, Jack.

LMP-EVA Well, they like to have some of it in black and white, you know.

CDR-EVA *** that rock.

LMP-EVA *** to look at the objectives for this station. I hope we're meeting them.

CDR-EVA Well, we want to get 500s of that boulder track. I know; I want to get that.

LMP-EVA Okay. A piece of that spalled rock that was sitting by the gnomon - Oh, watch out gnomon. How about that? - is in - bag 535.

CDR-EVA *** one in there already?

LMP-EVA Yes.

CDR-EVA You won't be able to reach - -

CC Okay. We copy that one, Jack.

CDR-EVA You won't be able to reach my bag.

06 18 32 08 LMP-EVA No, but you can put it in mine. Can you reach it?

CDR-EVA *** it.

LMP-EVA Bob, one of the light-colored inclusions looks like it may be anorthositic - gabbroic anorthosite - *** my terms straight. The host rock has dark enough zap pits *** anorthositic gabbro, if I didn't say that. Some of the light-colored inclusions have slightly lighter colored glass, and they may be the gabbroic anorthosite. *** like this one and that one.

CC Okay. I copy that, Jack.

CDR-EVA Some of those inclusions get to be bigger than the size of a baseball. There's one here and a couple up there.

LMP-EVA Let me borrow your hammer.

CDR-EVA Yes. Jack, try a little higher. See that one right on the - right there. Right - Yes, that's a hard rock.

LMP-EVA Yes, that's a hard rock. You might be able to do it; I can't.

CDR-EVA ... We need some of the soil outside the shadow here.

LMP-EVA Yes. How about over where your bag went? Let's move around here - I think there is some - *** Oops! *** this slope over here. Okay. How about out over here? Are we supposed to get a - *** we here?

CDR-EVA I don't know. I'd like to get - When you face uphill, your camera faces down.

LMP-EVA We want to get a rake on the rim of that little crater down there, I guess.

CC Okay, 17. Roger. You were asking about objectives. Of course the primary objective is docu - documented samples of the blocks; and then, also, we'd like to get some of the rake and soil sample out in the surface, namely, the rim crater there, if that's available. And one of the things, of course, we're looking for is the variety of rocks here, if there's more than just the one boulder. You can sample the boulder for a while, but we would be interested in seeing if there is more than just the single type of rock. Probably, also, samples from both sides - both halves of the rock. What we said this morning in terms of - -

06 18 35 18 LMP-EVA Come on up here, Geno.

CC - - combining stations 6 and 7 to an hour and 20 minutes -

CDR-EVA Okay.

LMP-EVA If you can.

CC And so it's sort of your option as to how much time you spend here and how much you go on to station 7 and spend. If you feel that it's worthwhile, we could spend essentially all that hour and 20 minutes at this station. But if we did that, we'd like to get a fair variety of blocks, if they're available.

06 18 35 38 LMP-EVA Okay. Geno, we sampled some of the light-colored group - As a matter of fact, this block looks different.

CDR-EVA Well, so does that big one - -

LMP-EVA It's grayer.

CDR-EVA That's why I've been photographing it.

LMP-EVA What it is, I think - it's a big blue-gray rock - itself is crystalline, I believe. The inclusions are much more sharply defined, and it's nonvesicular; and it's included, or at least it's in contact with the very vesicular anorthositic gabbro - *** there. See that?

CDR-EVA Yes, the whole big one. I just ...

LMP-EVA Did you get some pictures of it?

CDR-EVA As I bounced around there, I took pictures of it.

LMP-EVA Look, we can get some of that light-colored stuff in there, along with the blue-gray.

CDR-EVA We ought to get as big a piece of that inclusion as we can. There's - -

LMP-EVA See it up in there.

CDR-EVA Yes. *** out of line of sight with them. We're behind a boulder.

LMP-EVA Yes, sorry about that. But - -

CDR-EVA *** got to get it.

CC We can hear you loud and clear. We're just looking at rocks right now.

CDR-EVA Okay, Bob, the boulder downslope is more of a light-gray vesicular *** boulder. The one Jack just talked about with some of the larger white inclusions is less vesicular, and it's a - *** a blue-gray rock. *** on my tail here, I'll get - -

LMP-EVA The locator is of Henry.

CC *** that.

CDR-EVA Okay; let me try and get up there. *** We must be high enough to see something. I haven't even looked back.

LMP-EVA *** get a closeup before you start ***

CDR-EVA ... give them something a little different up in there too, Jack.

LMP-EVA Yes.

CDR-EVA *** try and sample that. Okay. Let's get the -

LMP-EVA You want me to get my scoop under there? Probably won't fall out.

CDR-EVA *** many of these pieces as we can. I don't know how many are going to come out.

06 18 38 17 LMP-EVA (Laughter)

CDR-EVA Outstanding! Outstanding! This whole thing will come out here in a minute.

LMP-EVA *** it. I'll watch it. Got it?

CDR-EVA Move your arm up or down. Okay. I got it in case we don't get another one. Hey, we're getting good at that.

LMP-EVA Yes. Can't hold that much longer.

CDR-EVA Let me get up on this ***

LMP-EVA Why don't we get a - get a bag out. Let me put these in a bag.

CDR-EVA That's why I'm getting up here so I can - -

LMP-EVA Oh, okay.

CDR-EVA - - just get my balance. Bob, 556 *** the light-colored inclusions in the blue-gray rock.

LMP-EVA It's chips.

CDR-EVA Chips of it.

LMP-EVA I think we lost that other one. That's good enough.

CC Okay. Copy that.

CDR-EVA I got it; I know where it is.

LMP-EVA That's all right. It's not a lot of sample, but it's representative, I think. It looks a lot like that sugary rock I sampled yesterday, doesn't it? Found in the - that we sampled in the - -

06 18 39 41 CDR-EVA Yes, it's pretty easy to break up; it's really not very coherent at all.

LMP-EVA *** I thought last night, Bob, that I should use the word aplitic for a texture that we saw in that inclusion yesterday on the South Massif.

CDR-EVA *** keep from falling on my tail -

LMP-EVA Can you get a - -

CDR-EVA I want to - -

LMP-EVA ...

CDR-EVA ... beat up inclusion of some sort. Oh, there's a nice piece coming out. Oh, wait a minute - don't lose it.

LMP-EVA I got it. I got it.

CDR-EVA Got it.

LMP-EVA Okay.

CDR-EVA Okay. We have another inclusion that, on the surface, has a more reddish-brown texture. Interior looks pretty much the same; it's a very light gray.

LMP-EVA This looks like a piece of breccia. Looks like a fragment breccia that got caught up in this thing.

CDR-EVA Yes, well, the whole thing is obviously a breccia. I'd sure like to get that - -

LMP-EVA Well, I'd say - I'm not sure; it's obviously a breccia. I think it may - -

CDR-EVA Well, look at all these things.

LMP-EVA - - may be an igneous rock with breccia inclusions.

CDR-EVA Well, okay, but -

LMP-EVA Which is sort of in the same class.

CDR-EVA Sort of makes a breccia - -

LMP-EVA Well - -

CDR-EVA - - out of the big rock.

LMP-EVA Okay.

CDR-EVA Except you can - -

LMP-EVA I can't get in there, Geno, you'll have to.

CDR-EVA Okay.

06 18 41 08 LMP-EVA No way -

CDR-EVA Let me -

LMP-EVA *** it's easier for you.

CDR-EVA *** give them a number on that? No.

CDR-EVA It's - 5 - -

CC Negative.

CDR-EVA 536.

LMP-EVA Squash it - cramp it a little bit, if you can; a little more.

CDR-EVA Did you get that 536, Bob?

CC Roger. 536 for the last one.

LMP-EVA Okay; let's get some - -

CDR-EVA Okay. Let's go get the host rock here.

CC And -

LMP-EVA How about that - How about that - whew - how about that piece?

CDR-EVA How about this one, with the inclusion? Maybe I can get this one. *** may have been a little optimistic.

CC Okay; and, 17, we'd like - Do you guys have a feeling that the two halves of the big boulder are different rocks? Or is it the same rock split?

06 18 42 11 LMP-EVA No, they're - they're two - they were all one boulder, I think. They are just two major rock types in the - whatever they came from. And I tried to describe that to you. We have the contact in the central boulder. They're really three big boulders. The central boulder had the contact between the light-gray rocks - or the blue-gray rocks and the vesicular anorthositic gabbro.

CC Okay. And you guys have that pretty well photo-documented, right?

LMP-EVA Yes, it's in pretty good shape. We're working on it still.

CC Copy that.

LMP-EVA Try going on the side there, Geno.

CDR-EVA Just went from the side, Jack.

LMP-EVA That's enough. You got a piece of the - -

CDR-EVA ... host rock.

LMP-EVA I think you can get this one up here, can't you?

CDR-EVA I wanted that one because it had that inclusion wrapped in it. *** high here for a minute. *** one are you talking about? This one here?

LMP-EVA Yes, I just - *** come. Oh - oh - oh; okay. I've got it. I've got it.

CDR-EVA Okay.

LMP-EVA ... bag.

CDR-EVA They're both host rocks; we can put them in the same bag.

LMP-EVA No; let's don't. No, they're different places. 537 is a chip of the blue-gray rock - of the host - the blue-gray host rock - And let me get that other one -

LMP-EVA Oh -

CDR-EVA Oh - Be careful -

CDR-EVA *** rock up while you're there. It's right at your hand.

LMP-EVA I will.

LMP-EVA Okay.

CDR-EVA ... hammer somewhere.

LMP-EVA Okay. And 538 is another sample of that material - a little dustier.

06 18 44 55 LMP-EVA That's the blue-gray - -

CC Okay. We copy that.

LMP-EVA That's the blue-gray, Bob, with the inclusions in it. Now the blue-gray, the more you looked at it, it looks like a - -

CDR-EVA Give me your hand. Give me your left - your right hand.

LMP-EVA Huh?

CDR-EVA Give me your right hand. *** over. *** over. *** over.

LMP-EVA Well, I did. How do you want it over?

CDR-EVA You kept turning it over in the same direction. Like that, so I can fix that. Okay. Now give me your bag, and I'll get it in there.

LMP-EVA It - the blue-gray rock, on closer examination, looks like a partially recrystallized fragment breccia. *** hard.

CDR-EVA And I'm going to - -

LMP-EVA Are you going to get the afters in there?

CDR-EVA Yes, I'll get them. I want to do a little bit better documentation on this thing - Bob -

LMP-EVA I'm going to go over and look at that contact.

CDR-EVA I got a few closeup stereos of the inclusion *** tried to sample, and I'm going to see if I can't give you a little ... stereo around this thing - if I can stay on my feet.

06 18 46 30 CDR-EVA Do you read me, Jack, okay?

LMP-EVA Yes, I hear you.

CC *** reads you loud and clear, also.

CDR-EVA You can see where we've been pounding on this rock. We didn't succeed in getting samples everywhere. And I'm giving you a 90-degree corner.

LMP-EVA Bob, it looks to me like there are inclusions of blue-gray in the gabbro - in the anorthositic gabbro.

CDR-EVA Are you saying you think this whole big - -

CC Positively outstanding.

CDR-EVA You think this whole big blue-gray thing is an inclusion?

LMP-EVA Yes, sir. And there's some little ones over here.

CDR-EVA Yes, but then within the blue-gray, we've got all these other fragments.

06 18 47 23 LMP-EVA Well, that's right. It's just several generations of activity; and it looks like the gabbro, though, picked up the fragmental breccia as inclusion. Bob, I'd - It really looks that way right now. There's a - -

CC Okay. Charlie is here mumbling something about it looking just like house rock [?].

LMP-EVA It's very crystalline. I'll tell you, it's not a breccia - not like house rock [?]. Not to take anything away from house rock [?], though.

CDR-EVA Hey, Bob, there's a lot of mantling on a very shallow slope of a fracture here on one of the upslope rocks. I would assume it's just part of the talus picked up as its rolled down. But if it's worth sampling, you might think about it.

CC Okay, Gene, if you can get that fairly readily, why don't you - You can perhaps just scoop it up with the bag.

CDR-EVA That's exactly what I can do. And it'll be in my - -

CC If you can get up to the rock, that is.

CDR-EVA It will be in my flight line stereo, and it's going to be bag 557. *** take an after and show you where it came from. This is the easiest part of the rock in the world to work. Man, here's a big - -

CC Okay. Copy that.

CDR-EVA There's a big white clast. There's one on top about a foot and a half across, and here's one - must be 2 feet across - 3 feet. *** in the blue-gray. Feel like a kid playing in a sandbox.

LMP-EVA Well, Bob, I think I've done the best I can. I would - I'd say that they're pretty clearly inclusions of blue-gray in the anorthositic gabbro here near the contact.

	CC	Okay. And, Gene, your bag is hanging by one hook there. Be careful, if you can.
	CDR-EVA	Okay. And I gave you 557, I believe. Didn't I?
	CC	Or LMP - Roger. We have that one. And whoever is giving us 557 -
	CDR-EVA	Okay. I'll have Jack fix my bag.
	CC	And whoever is giving us 557, so - Yes.
06 18 50 05	LMP-EVA	Okay, Bob, by accident - I didn't think I could do it but I got a sample of the inclusion. And it's in bag 539.
	CDR-EVA	Hey, Jack, that's your bag that's hanging by one hook. Let me go get it.
	LMP-EVA	Oh, they're talking to me, huh?
	CDR-EVA	Yes, because I didn't -
	CDR-EVA	I didn't think they could see me. I'm way up on top.
	CC	Yes.
	LMP-EVA	And it's blue-gray with light colored - -
	CDR-EVA	Put these in my bag.
	LMP-EVA	- - inclusions in it.
	CDR-EVA	All right.
	LMP-EVA	But the whole thing seems to be pretty well altered, or metamorphosed - compared to the major rock we sampled - to the other blue-gray rock. This bag is terrible. I can't - it won't latch.
	CDR-EVA	Man, there's a dark hole in there.
	LMP-EVA	Don't let me - I'm not -
	CDR-EVA	Here's another bag to put in there before you go.
	LMP-EVA	Oh, okay. It won't latch.

CDR-EVA Well - -

LMP-EVA Not at this angle.

CDR-EVA *** thumb on one side, and I'll - -

LMP-EVA It's dead or something. There, that's pretty good.

CDR-EVA *** fix your bag.

LMP-EVA Okay, Bob, I think that inclusion will give you - -

CC And, 17 - -

LMP-EVA - - an example of what this thing - what the anorthositic gabbro did to the blue-gray breccia.

06 18 51 58 CC Okay. We copy that. And we're ready for you guys to leave this rock and press on and either get the rake soil and cores near that crater down below the rock just a shade, or else go on to some other different variety rocks in the area.

LMP-EVA ... Getting back up is.

LMP-EVA *** what, Gene, I could go down there and start a rake, and you could come down there.

CDR-EVA Okay. I - Yes, I don't think you ought to try and walk back up, Jack. Let me get a pan from right here where I got this sample.

LMP-EVA Okay. I'm going to come over and - *** get the rake and then get your gnomon.

CDR-EVA *** my gnomon?

LMP-EVA Get uphill a little bit, if you can, for the pan, so that you don't - so you see my other pan station.

CDR-EVA Where was it?

LMP-EVA It was over there in that crater, just uphill from the Rover.

CDR-EVA I'm going up there.

06 18 53 04	CC	Hey, and, 17, we aren't all that gung ho about that particular crater if it's that much of a job to get down to it and back up. Just - we just need a decent place for a rake soil sample and a single core.
	LMP-EVA	Okay.
	CDR-EVA	Bob, we don't move around from here too much. I tell you, these slopes are something else.
	CC	Yes. We agree with that, from what we see on the television. So use your judgment, and get them where it's the best place.
	CDR-EVA	Well, you might take a look at me walking up. But I don't think I can get to the top. I just got to get a place I can get a pan from, right here. *** in this little hole. Okay; now I left the gnomon down there.
	LMP-EVA	Okay. I'll have to go get it. I think they're set up right here near the Rover.
	CDR-EVA	I think I'll go and save some water, back on INTERMEDIATE. Okay.
	CC	Copy that.
	CDR-EVA	Hope my lens is clean. Bob, from up here, *** mantle is not evident until you see the angular reflection up on the scarp. Very thin, light patches might be evident out on the valley, but not nearly as pronounced as I might have thought from this altitude. Oh, and there's Challenger. Holy Smoley. You know, Jack, when we finish with station ***, we will have covered this whole valley from corner to corner.
	LMP-EVA	*** the idea.
06 18 55 18	CDR-EVA	Yes, but I didn't think we'd ever really quite get to that far corner. Not 2, but this other one. And we're going to make it.
	LMP-EVA	Bob, that blue-gray rock near the contact with the anorthositic gabbro *** get some vesicles in it. I think they'll show up in *** pictures.

CC Okay. We have that too, Jack.

CDR-EVA Okay. I just ran out of film at 160. And I'm about two pictures short of the pan, and they're upslope. I think I can cover most of that with the 500.

CC Okay, Gene. You going to go to the Rover and change your mags now?

CDR-EVA Well, Jack's going to need some help from me.

LMP-EVA I'm starting to rake.

CC Okay. Let me know when - -

CDR-EVA Jack, if you got - -

CC Let me know when you get to the Rover to change the mags, after you get done with that, and I'll tell you what mag to change.

CDR-EVA Jack, if you got enough film, I'll just come and help you.

LMP-EVA Okay.

CDR-EVA Okay?

LMP-EVA Yes.

CDR-EVA *** me to dust my camera, too, will you?

LMP-EVA Don't forget to dust your camera.

06 18 56 50 CC Okay. We'll keep track of that for you, Gene.

CDR-EVA Okay. *** before pictures?

LMP-EVA I'm getting them now.

CDR-EVA Okay.

LMP-EVA (Laughter) It ain't easy, McGee.

CDR-EVA Man, I tell you, these slopes are great. I wouldn't mind being up on top coming down; but - hey, that boulder track is quite a trench.

LMP-EVA Yes, sir.

06 18 57 24 CDR-EVA That thing must be a meter or 2 deep, huh?

LMP-EVA Okay; the big rake. Well, I think I'll try - -

CDR-EVA Wouldn't it be easier to rake downhill.

LMP-EVA It would, but the stuff wouldn't stay in.

CDR-EVA (Laughter) Well, I don't know.

LMP-EVA It's a thought.

CDR-EVA *** get that one by the - -

LMP-EVA Yes, I will. *** not really supposed to be selective about raking.

CDR-EVA Well, you're not; you're just covering the area.

LMP-EVA That's why I set up there.

CDR-EVA A selective sample is better than no sample at all. ...

LMP-EVA ...

CDR-EVA *** 558.

CC Copy 558.

CDR-EVA Bob, most of them are - -

LMP-EVA Let me go another couple of flights [?].

CDR-EVA Okay. There's one a couple of inches. Most of them are an inch or so or smaller. They're angular to subrounded fragments. *** look like the inclusions. As a matter of fact, the ones that are broken open look like some of the light-colored inclusions we saw in the big boulder. The others are too dust covered to say anything about.

LMP-EVA A couple of them look fairly coarsely crystalline. Okay. *** in there.

CDR-EVA *** deal. *** three more.

[redacted]

LMP-EVA Let me get an after, such as it is. Oh, we want the - -

CDR-EVA They want the soil here.

LMP-EVA Soil - that's right.

18 59 44 LMP-EVA Okay. You want to put that in?

CDR-EVA Yes, I'd better put it in before I - *** Let's try for the soil. 559's the soil.

CC Okay. Copy that. And, 17, our present plans from the back room are we'd like to get the single core, the 500 millimeter shots - and, I guess, maybe one could do one, and one could do the other - and then we'd like to press on and do a short station 7, unless you think you have got a fair variety of rocks here. The feeling is to do that to take a look at a variety of rocks.

LMP-EVA Yes.

CDR-EVA Little more, little more, little more.

CDR-EVA Okay, Bob. I'll get the core and let Jack get the 500. 559 is the kilogram of soil. I think we've pretty much covered the general variety we've seen here. I think we've seen most of them in that boulder.

CC Okay. And so we'd like to go on to station 7, then, when you get the 500 and the core, in hopes of finding a variation of boulders along the front.

19 00 56 CDR-EVA Okay. *** you get it. Okay. The after. Okay; why don't get the 500, and I'll get the core.

LMP-EVA And the LMP's on 120.

CC *** 120 there. And, Gene, if you want to change, we recommend magazine Foxtrot or Fran, as the case may be.

CDR-EVA Okay. Will try Foxtrot - Franny. Don't forget to get that boulder track. That's a good one.

LMP-EVA I'm going to have to lean against the Rover to - -

	CC	And while you're at it, Gene, you might remember to dust your camera there when you're leaning over the seat.
	LMP-EVA	Let me look at your camera.
	CDR-EVA	Oh, man, if this Rover wasn't here, we'd roll downhill.
06 19 01 42	LMP-EVA	Hey, Bob, I think we could use an upper here if you want to save the lowers.
	CDR-EVA	*** so, too.
	LMP-EVA	Whichever you want. Do you want your - -
	CDR-EVA	No, I'll get it. Why don't you get your 500, and I'll - -
	LMP-EVA	Okay. But do you want a core? Watch the fender.
	CDR-EVA	The core's in there, isn't it?
	LMP-EVA	Well, there's some under my feet if you want to use those.
	CDR-EVA	I'll use those.
	CC	Stand by, Jack. We have three lowers and two uppers, so we'd just as soon use the extra lower here in the single core.
	LMP-EVA	Okay.
	CC	That'll give us two uppers and two lowers left for doubles.
	LMP-EVA	There should be a lower in there, Geno.
	CDR-EVA	Yes. Bob, any special place you want that? Just out here on the slope?
	CC	That's affirm.
	LMP-EVA	You should have put the gnomon up. Well -
	CC	That's affirm. Just out there on the slope.

LMP-EVA *** any film to document - -

CC I guess if you saw a crater or something, you might look at that, but primarily we're looking at the crater.

CDR-EVA I'll get it. I'll get it, Jack. Don't worry. Okay. We have a couple of dents in our fen - in our wheels. That's better than having a flat tire. Did he say in a crater?

LMP-EVA I'm not sure what he said. *** How do I get this doggone -

CDR-EVA ... to come off?

LMP-EVA You got to unlock it.

CDR-EVA Yes, it is unlocked.

LMP-EVA Okay. Now push down and turn.

CDR-EVA Okay. I got it.

LMP-EVA ...

CDR-EVA Well, why don't you lean against the rock? Go over there and lean against it.

LMP-EVA Well, I have to do something. I was trying to get so I could lean against the Rover, but that ain't going to work.

CDR-EVA The Rover isn't steady enough for you go lean against.

LMP-EVA Well, it's steady enough. There's just no place to lean.

CC Okay. And, Jack, and if you'll listen for a minute, I'll tell you some possible 500-millimeter targets the people have in mind. One, the LM, if you can see it from there. Two, Nansen, if you can see it from there. Three, Lara; and four, Shorty. In other words, I guess they're talking about looking along your traverse from yesterday. It would be mostly the back shots, apparently. And then, also,

the South Massif, and I don't know what you can get of boulder tracks leading up the North Massif. And most of those will be looking downhill towards the LM, stations 2, 3, and 4. Over. Nansen, Lara, and Shorty.

LMP-EVA I got you, Bob.

CDR-EVA Yes, the LM is visible by the way.

06 19 05 25 LMP-EVA Okay. I got a set of the - the - what looks like the outcrop from which the boulder came. I'm afraid they moved a little bit. Oh, I can't - That's it. I got a few pictures looking up the boulder track and then off to the right - to the left a little bit - and one off to the right. And I think - I'm not sure how well they overlap; that's just an awful hard shot.

CC *** good on that. *** done with that, have you got a frame count - or you're still taking them, I guess; it looks like.

LMP-EVA Yes.

CDR-EVA Okay. My camera is clean. Magazine Foxtrot - is on about frame 2, and I cycled through it. And I've got the core all set, and I'm going to go get it. And I didn't hear where you said to put it, Bob.

CC ***

CDR-EVA Oh, man, you're easy. Anywhere. Not the bottom of a small crater, huh?

CC And did you get your camera any place? And did you get your camera dusted?

CDR-EVA I got it all dusted and the mag's changed.

CC ***

CDR-EVA It's 448.

CC Copy that.

04 CDR-EVA Okay. I'll even get you a picture of it. Oh me. Oh my. Oh me. Oh my. *** the LM from there?

LMP-EVA Yes.

CDR-EVA That core went in very easy, Bob. I pushed it in about a quarter of the way. And about another five or six whacks, and it's in all the way. Okay. Come on out now, baby.

LMP-EVA Okay, Bob. *** and station 3, and station 2, and what else.

CC And any sort of outcrops you see in the South Massif.

LMP-EVA *** we shot those.

CC Okay. If you got those, fine.

LMP-EVA No, I mean the other day.

LMP-EVA I'll try again.

CDR-EVA Okay; and I got you a little soil me -

CC Well stereo is stereo is stereo, I guess.

LMP-EVA Well, but it's not stereo; it's right along the same line.

CDR-EVA Little soil mechanics of the hole, which stayed intact; very nice and round.

CC Okay. We copy that.

LMP-EVA Okay. Oh, man.

CDR-EVA Yes, sir, we got a couple of dented tires.

LMP-EVA Okay. My hands have had it.

LMP-EVA You aren't going to get anything else out of me if I keep taking pictures.

CC Okay; good enough. And, Gene, what's a dented tire?

CDR-EVA A dented tire is a little - oh, a little golfball size or smaller indentation in the mesh. ...

LMP-EVA Frame 31, Bob.

CC That sounds like a dented tire; that's how it sounds.

CDR-EVA That's sort of like what it is.

CC Cappy - copy frame 31.

LMP-EVA Okay. LMP was what? 120? I guess we can get to the next station with that.

CDR-EVA Yes, I got a brand new mag out.

CC Yes; Roger.

CDR-EVA *** I'll need your rammer.

CC And we'd like to get you guys rolling as soon as feasible there.

06 19 11 27 LMP-EVA Yes, sir. It's our policy.

CDR-EVA Okay. I'll need your rammer, so if you'll just turn right.

LMP-EVA *** timing. Pin's out; core tube is safe. In full.

CDR-EVA I knew it was. Okay. You take this and put this under your seat, if you want, Jack. And I'll get the TGE. Oh, let me put your shovel back on for you. I'll get it.

LMP-EVA Get that?

CDR-EVA Yes.

LMP-EVA Don't lose that. Boy, if you do - Okay. Did you give them the number?

CDR-EVA Yes, they got the number.

LMP-EVA Under the LMP's seat.

CC We have it. *** under the LMP's seat.

LMP-EVA (Laughter) I'm sneaking up on the TGE.

CDR-EVA You need some help?

LMP-EVA No. No, I was - just sneaking up; that's all.

CDR-EVA ... let you lean on me.

LMP-EVA No, I got it.

06 19 12 50 CDR-EVA 670, 109, 801; 670, 109, 801.

CC We copy that.

LMP-EVA I wish we - *** I didn't do. *** doing that - Didn't get pictures of those foliated vesicles. I don't think the ones you had were in that kind of rock.

CDR-EVA I don't want to lose that thing, so I guess - -

CC Okay, 17, when you get back on here, we don't need any charges, and we'll leave the SEP turned off.

LMP-EVA *** sure. Did you turn it off, Gene?

CDR-EVA Yes, I turned it off. I turned it off. Okay. Let me see. We want to move on to 7 here. Rake, talus, documented core, you got your *** We got two pans, TGE, camera. Okay. We're going to head east and look for station 7 - block variation, contact change, and get a different sample of rocks. Okay. I sure want to get one or two of those nice ones in the big bag while you're over there.

LMP-EVA Open the gate, and I'll bring one.

CC And 7 - Okay. And let me know when you get ready to get back on the Rover there, 17.

CDR-EVA *** isn't opening again. Should, though. It's all set right. *** right handle.

CC *** put them under Jack's seat if it's easier.

CDR-EVA Okay. What do you want done to the SEP while I'm here? Do you want the blanket stayed - left open?

	CC	Okay; we'd - Negative. We'd like the blankets closed and taped down again, if possible, and both switches left off. We won't touch it again until station 8.
06 19 15 22	CDR-EVA	Oh, tape's not going to stick anymore; I'm afraid.
	LMP-EVA	Big bag open?
	CDR-EVA	Yes, it's all open. All set.
	CC	*** try.
	LMP-EVA	Get me a - ... sample bag for one here. It's pretty fragile.
	CDR-EVA	Okay. Oh, that doggoned thing's not going to - That tape is full of dust now. Okay. Wait a minute, Jack.
	LMP-EVA	Here, let me get this big one. I'm about ready to drop it. *** like a gabbro.
	CDR-EVA	... bag 560.
	LMP-EVA	And 560 has an undoc - -
	CC	Copy 560.
	LMP-EVA	- - undocumented except by the pans - very white - looks like a crushed anorthosite. It looks like the - some of the inclusions in the breccia - in the gray breccia - gray and recrystallized breccia.
	CDR-EVA	Jack, when you get around, and we close this gate, you might try and hit that - -
	CC	Okay. We copy that.
	CDR-EVA	- - top of that SEP down again.
	LMP-EVA	I will.
06 19 16 28	CDR-EVA	Hey, Bob, you're staying keyed an awful long time. We can hear a lot of what's going on back there. *** That's got it.
	LMP-EVA	... it's -

CDR-EVA *** got it. Okay.

LMP-EVA Oop, oop, oop, oop. Why'd that come off?

CDR-EVA Well, because it's not locked. It's ... never was locked.

LMP-EVA (Laughter) *** out.

06 19 17 08 CDR-EVA Okay. We're moving. Sort of.

CC And, before you get on, remember to close the battery covers if they -

LMP-EVA Your camera lens looks all right, Geno.

CDR-EVA Yes, I dusted it already.

LMP-EVA Oh.

CDR-EVA Okay. Cover closed -

LMP-EVA Okay. Do they want it on or off? Leave it off, huh?

CDR-EVA Leave it off, but try and close that cover as best you can.

LMP-EVA *** that tape has had it.

CDR-EVA I know it.

LMP-EVA You want us to tape it again, Bob? *** with the tape?

CC If you can grab the tape right off, but don't spend a lot of time on it.

LMP-EVA *** do with that tape?

CDR-EVA It's under my seat. I'll have to - let me get it.

CC Let's worry about - let's worry about it at station 7, if we're going to worry about it. Press on.

CDR-EVA Yes. Let's - let's forget it now. It's too hard to work on there, and it's not going to take just a minute. It's going to take too much time.

LMP-EVA I'm not sure I can get back on here.

CDR-EVA Well, let me give you a hand. We need any - we don't need any -

LMP-EVA No. Nothing. As a matter of fact -

06 19 18 26 CDR-EVA I can drive, Jack.

LMP-EVA Why don't you drive down and get - so you're not ... You can get on -

CDR-EVA You can go downhill very easy.

LMP-EVA Yes.

CDR-EVA Okay. Let me get the TV; the battery covers are closed - -

LMP-EVA Let me carry -

CDR-EVA Why don't you just go down there.

LMP-EVA I'll carry the Rover samples, just in case.

CDR-EVA Okay. I'll get that out of your way, too.

LMP-EVA Okay. I'll head down to that ... boulders right over there ...

CDR-EVA Okay. You might, if you get another sample - a large sample, you might grab it, and we'll throw it in the footpan here - and - and I'll see if I can't find a level spot to - -

06 19 19 12 LMP-EVA I sort of ought to have my scoop, too.

CDR-EVA - - help you get on. *** take too much; just take that. That's all you need.

LMP-EVA How about letting me have your hammer, then?

CC Okay; and, 17, can you verify that the - that the gnomon is back on the Rover?

CDR-EVA Gnomon is on the Rover. The TGE is on the Rover.

LMP-EVA The rake.

CDR-EVA The rake is on the Rover. The scoop's on the Rover. We got the - you put the core under your pan, right?

LMP-EVA Yes, that's right.

CDR-EVA Okay. I'm going to power up and see if I can't come down and get you.

LMP-EVA *** walking downhill. Boy, that boulder track is impressive *** symmetrical.

CC Okay; and, 17, when you get moving - when you get moving we want to get, and I quote, "a maximum variety of hand samples with a minimum amount of documentation, in a minimum amount of time at station 7." It's just an attempt to see what kind of variety we can get along the face of the front. Over.

CDR-EVA Roger. Okay. Well, I'm not sure I can get down without ending up in your seat.

LMP-EVA Need some help?

CDR-EVA No, uh-uh.

LMP-EVA I shouldn't have left.

CDR-EVA No, no. I don't need any help. I'll get on. That was easier than anything. *** getting one on the upslope side is easy. *** ought to turn my water off of MAX if that's where it is. *** cold. I *** run out today. Well, the roll indicator says 15 degrees; and the pitch indicator says about 12. I don't know if I believe all that. Bob, you with us?

CC Go ahead. Right. We're with you.

06 19 22 06 CDR-EVA Okay. I'm rolling. Man, this is still a slope. Jack, I'm going to pull around and in the front of the way you're facing.

LMP-EVA I can go down *** a crater over here. Don't drive through it.

CDR-EVA Oh, there you are. This is much better. How is this?

LMP-EVA That's great.

CDR-EVA *** able to pick up lots of those fragments out in that field out there.

LMP-EVA Be right with you.

CDR-EVA Okay. Bob, I just came downslope reading 193/3.1 - just about 100 meters to pick up Jack.

CC Okay; copy that.

LMP-EVA Okay. *** 48 Yankee has a sample of about a half - one-third-meter boulder that ...

CC ...

CDR-EVA ...

LMP-EVA ...

CC *** that.

CDR-EVA Oh, you just kicked a snowstorm of dust across here.

LMP-EVA I'm sorry. *** fell, too.

CDR-EVA Did you? You all right?

LMP-EVA Yes. *** hammer?

CDR-EVA Yes.

LMP-EVA Okay.

CDR-EVA I got to drop it in the pan here. *** on to it, I think.

LMP-EVA *** help that one.

06 19 24 10 CDR-EVA *** get some more level spots. I can dust this thing back there.

LMP-EVA *** on?

CDR-EVA *** high. You're twisted. Go away from me one twist.

LMP-EVA Okay.

CDR-EVA *** caught in something? Yes, it is. You're - Hold it - wait a minute - get up, get up, get up. You've got - you're sitting on - get up.

LMP-EVA What am I sitting on?

CDR-EVA *** get out. *** put this away. Wait a minute. Get up, out - all the way.

LMP-EVA Oh, that thing.

CDR-EVA Yes, this thing.

LMP-EVA That's right.

CDR-EVA That's where it's setting high.

LMP-EVA I knew I'd forget that. Okay. Now, let me get this thing out. Okay. Let's press. *** latched.

CDR-EVA *** set?

LMP-EVA Yes.

CDR-EVA Okay.

06 19 25 34 CDR-EVA We're rolling, Bob.

LMP-EVA LMP frame - is 130.

CDR-EVA *** lot of static now?

LMP-EVA Yes.

CDR-EVA Okay.

LMP-EVA Hey, you got a rock on your right. I guess you - -

CDR-EVA Yes. I got them. I got them all. I got the low gain set. Hello, Houston. Do you read?

	CC	*** read loud and clear.
	CDR-EVA	Okay.
06 19 26 08	LMP-EVA	... field, not this block but there's sort of a collection of them - -
	CDR-EVA	Yes. Way out there - -
	LMP-EVA	- - way out there, about 300 meters or so.
	CDR-EVA	Oh, at least. Yes.
	LMP-EVA	Oh; going into the Sun, I can't see a thing to tell you about Wessex Cleft *** haven't already said.
	CC	Okay. Station 7 is nominally 208 and 3.3, but it's any group of any significant boulders you want to stop at, in reality.
	CDR-EVA	Understand.
	LMP-EVA	Oh, easy.
	CDR-EVA	*** like you're on a downslope over there?
	LMP-EVA	Yes. I feel like you're about ready to spin out downhill any minute.
	CDR-EVA	Do you? I don't feel that at all up here (laughter).
	LMP-EVA	Bob, it's hard to give you much *** into the Sun the way we are.
	CDR-EVA	We must be about 200 meters up the slope, looking at that little valley down there, Jack. Am I right?
	LMP-EVA	Yes. I think you're right. The pattern on the slope *** doesn't look much different than on the light mantle. Matter of fact, it looks very much like light mantle, except for these large blocks that are in it.
06 19 27 21	CC	Okay. Copy that. And you guys may still have your visors up. We can't tell, but you might be better off with them down, if you've forgotten that they're up.

LMP-EVA *** I can't see. My hands work just as well as my visor, as a matter of fact.

CDR-EVA No, I can't believe - mine could be up.

LMP-EVA You've got a crater right in front of you.

CDR-EVA Yes. I got it.

LMP-EVA Okay. That looks like a pretty good pile to work on.

CDR-EVA Yes. Let's go over in there.

LMP-EVA Hey, wait a minute. Okay.

CDR-EVA Bob, what heading are you going to want me to park on? I want to get in that flat area, Jack, so I can dust the radiators.

06 19 27 55 LMP-EVA Yes.

CC We have no constraints, Gene. This is going to be a very short station. Probably not more than 10 or 15 minutes. But just to grab, as I say a maximum variety of hand samples with a minimum amount of documentation and a minimum amount of time.

CDR-EVA Okay. We can do a pan, and pick up a lot of those small ones, Jack.

LMP-EVA Yes.

CDR-EVA Rather than trying to chip.

LMP-EVA *** swing around down there?

CDR-EVA Yes, I want to see us a little more level.

CC Okay. We would like to have the TV camera and its mirrors and stuff dusted there, however.

LMP-EVA I thought you were going to stop back there.

CC But we won't do anything to the batteries.

CDR-EVA Well, okay. I was going out - out here around this big one.

	LMP-EVA	I'm sorry. I misunderstood you.
	CDR-EVA	Yes. See, there's a lot of little ones up in here I want to - Okay. Do not do anything to the batteries. Understand.
	LMP-EVA	I can't figure out where you're going to stop.
	CDR-EVA	Right in here - right here to give you as much of a level spot as I can. *** about as level a spot as I can find. I'm inside the slope of a crater.
06 19 29 03	CDR-EVA	Bob, I'm at 200/3.3.
	LMP-EVA	*** help you with the dusting, Geno?
	CDR-EVA	No, I'll get it. Only one guy can do it. I just - we'll take - you take a pan before, and we'll start picking up some of those samples, and I'll take a pan afterward.
	LMP-EVA	Well, let's see here.
	CDR-EVA	*** what kind of variety we can get here.
	LMP-EVA	There is another one of our blue-gray breccias, I think, over there; recrystallized breccias with some *** crushed anorthosite in it. I think right in here I'm going to take the pan at about - -
	CC	And, Jack, what's your frame count?
	LMP-EVA	131.
	CC	Okay. Press on.
06 19 30 21	LMP-EVA	Bob, I'm going to take the pan at 11 *** so you can see the fragments that we are going to pick up here. Then we can take another one at - for location work.
	CC	Copy that.
	CDR-EVA	Should have it, Bob.
06 19 31 07	CC	*** TV. And, I repeat, we'd like to get some dust both on the mirror - dusting of the mirror and the lens of the TV; TCU and the TV.

CDR-EVA Let me get you - let me get you out of the Sun.

CDR-EVA I wouldn't do this for anybody but you, you know that.

CC Looks good, Gene. Thank you.

CDR-EVA *** what? I'm getting tired of dusting. My primary tool, the dustbrush and the hammer - and my head. You ready to start picking?

LMP-EVA Picking.

CDR-EVA Okay.

CDR-EVA You notice the temperature difference with that high Sun angle?

LMP-EVA Yes.

CC Roger. You're probably letting in a lot of infrared through that - without having that gold visor down, too. That's sort of an infrared shield.

CDR-EVA Yes, but mine's been down all the time, Bob, except in the shade.

CC Copy that.

06 19 33 07 LMP-EVA Okay; 540 is the first bag of selected samples.

CC Copy that.

LMP-EVA Okay. I'm going to leave it open, but don't let me - let me get -

CDR-EVA Here, put that one in there.

LMP-EVA Wait a minute. Let's get a bag on it. We're getting too many rocks we don't know where they came from.

CDR-EVA I don't think it will fit. Know it?

LMP-EVA Yes, we'll wrap it a little bit. ... it will fit. ... fit. Okay. Bag 541 is partially around another big rock *** collection bag.

CDR-EVA Did you get pictures of this thing here?

	LMP-EVA	Yes; well, not the big rock yet. Not in focus anyway.
	CDR-EVA	I got to do that.
	LMP-EVA	*** collecting in this area.
	CDR-EVA	Why don't you keep grabbing a few, and I'm going to - -
	LMP-EVA	That's what I'm doing.
	CDR-EVA	That's one of the blue-gray rocks, Bob. And it's got a *** colored fragment that runs the full height of it, about a meter and a half thick. And then it's got the gray *** gray rock on the other side. As a matter of fact, - Let me look at it closely. *** fragment in it all right.
	CC	Okay. Copy that, Gene. And remember to document around the corner at your ... get some photo documentation of the boulder.
	CDR-EVA	... going to get a closeup stereo of it. I'd call it a dikelet, if you pinned me down.
	CC	Okay. Copy that.
	LMP-EVA	Pin him down.
	CDR-EVA	*** I could break a sample right off. Here's another one. It is a dikelet! *** three or four of them.
	CC	Copy that, Gene. Very good.
	CDR-EVA	Oh - me; oh, my. The material *** dike looks - Yes, it is, it is, it's not covering it. It's between the - it's between the - lighter-colored rock, and it's the blue-gray rock.
06 19 37 03	LMP-EVA	542 is another bag of goodies. Gene, let me get rid of this.
	CC	Copy that.

CDR-EVA Oh, wait a minute. I got - I got - Well, maybe it isn't a dikelet. Maybe it's just a screen covering, a flow covering.

LMP-EVA No, you got - They're - they're dikes.

CDR-EVA Let me - let me -

LMP-EVA They're little veinlets of -

CDR-EVA Let me get this whole thing in a bag. I got a - I got a rock, Bob. It's fractured, primarily around the dike. It's in several pieces, but we're going to put it all in one bag.

06 19 37 33 LMP-EVA 543.

CDR-EVA Some of the men are going to have to assemble that.

CC 543.

CDR-EVA Here, I got - I got - Let me get it piece by piece.

LMP-EVA Okay. We need to get a - Put one of those dikes in another bag. Bob, it looks like *** fraction of the blue-gray material has obviously - -

CDR-EVA Not too full. That's all right.

LMP-EVA - - intruded. Huh? Now, can you get that dike there? *** of it?

CDR-EVA That's right. Yes.

LMP-EVA *** get that?

CDR-EVA *** right here.

LMP-EVA ... you get more of it, right there.

CDR-EVA Yes. *** soft white inclusion again. It breaks pretty easy. Oh, it's got to be a dike. Look at that.

LMP-EVA It is.

CDR-EVA Okay.

06 19 38 38	LMP-EVA	Okay; 544.
	CDR-EVA	Oh, yes, it is because I just broke into it.
	LMP-EVA	Yes.
	CC	Copy that.
	CDR-EVA	I'm looking - -
	CC	And we'd like to have you guys moving again in 5 minutes to get to station 8 on time.
	CDR-EVA	Yes, sir.
	LMP-EVA	Looks like - although the blue-gray up on the hill looked like a fragment breccia, if this is still related, then it's - been some partial melting at some time.
	CDR-EVA	There's a preserved contact between the dike and the - -
	LMP-EVA	That's what I wanted.
	CDR-EVA	- - white material.
	LMP-EVA	That's what I wanted.
	CDR-EVA	Why don't we get this big piece of dike now?
	LMP-EVA	See if you can get - Whoa! Don't hit it again. There, you've still got some - still got some contact there.
	CDR-EVA	*** some good contact. Man, that'll do it.
	LMP-EVA	Okay.
	CDR-EVA	That'll do it.
06 19 39 28	LMP-EVA	Dike and intruded rock in 544. Now, these dikes are a dark bluish-gray. And it looks like there are some - it looks like they're very finely crystalline - maybe with some - -
	CDR-EVA	Get my bag. I'm taking some closeups.

	LMP-EVA	- - very fine phenocrysts. Okay.
	LMP-EVA	We ought to get - Well - -
	CC	Okay. We copy that.
	LMP-EVA	We ought to get a piece of the normal gray that the dikes are coming from. *** your hammer handy still?
	CDR-EVA	Yes.
	LMP-EVA	...
	CDR-EVA	I want to get this - -
	LMP-EVA	Go ahead.
	CDR-EVA	- - finish documenting this thing.
	CDR-EVA	Ah-ha! Ah-ha!
	LMP-EVA	*** here on this side, it looks like the vesicular anorthositic gabbro.
	CDR-EVA	*** get some regular pictures on this set. Okay. Here's the *** won't come off, this one will.
06 19 40 32	LMP-EVA	And - Yes. 561. That's a - a sample of the gray - looks like recrystallized breccia that the dikes are continuous with. And - -
	CC	Okay. And - -
	LMP-EVA	Bob, that's my turn to say "and a." *** the vesicular rocks - -
	CDR-EVA	*** finish the stereo around the corner here.
06 19 41 10	CC	*** guys have dropped the scoop there on the ground. And we're ready for you guys to leave.
	CDR-EVA	I know you are.
	CC	And you might grab one FSR on the way out.
	CDR-EVA	Okay. We'll do that.

06 19 41 34	LMP-EVA	Okay. There's that one. The vesicular anorthositic gabbro is in 5 - What is it? 62.
	CDR-EVA	62. *** in there, and you take the - -
	LMP-EVA	I got to get the scoop.
	CDR-EVA	- - scoop, and I'll get the hammer. Then make sure your bag is closed.
	LMP-EVA	Yes, I've got to check yours, too. Let me get uphill from you, though.
	CDR-EVA	Wait a minute. *** me the hammer. Can you get it now?
	LMP-EVA	*** one of the worst bags we've had - *** stay down. Probably - If we get time somewhere, we ought to change that out.
	CDR-EVA	Two of the corners are - -
	LMP-EVA	Yes, wait a minute - -
	CDR-EVA	Well - *** doing?
	LMP-EVA	It's okay. It'll hold for a while. Okay.
06 19 42 38	CDR-EVA	Okay. Here's an FSR that's about -
	CC	And, Jack, you're untied on one - One side of your bag is undone again.
	LMP-EVA	Oh, I'll get it.
06 19 43 05	CDR-EVA	Here's a football-size rock that was 50 percent varied.
	LMP-EVA	*** grip it? *** Got the gate open. I'm going to get your bag.
	CDR-EVA	Hey! Did you see the way I handled the hammer, huh?
	LMP-EVA	Yes.
	CDR-EVA	Takes you awhile to get accustomed to things. *** a little sluggish, too, Jack. Everything's so full of dust. Nothing wants to move anymore.

LMP-EVA Hey, that one looked like a piece of the gray rock, I think.

CDR-EVA Hey, I bet I didn't push the gravimeter, here. Did I, Bob?

LMP-EVA *** didn't tell us to.

06 19 43 45 CC No, we'll get it at station 8.

CDR-EVA Hey, Jack, you're going to have to close the gate, and I'll have to hold the big bag over the top.

LMP-EVA Okay.

CDR-EVA Okay.

CC And, Jack, before you leave, we'd like you to change mags before you go to - before you leave this station.

LMP-EVA Yes, sir. I'll do that.

CDR-EVA Wait a minute.

LMP-EVA I'll get it.

CDR-EVA Yes, but don't push.

LMP-EVA I won't.

CDR-EVA One of those lovely str - Okay, now you can push. *** it's locked.

LMP-EVA It's in.

CDR-EVA Wait a minute, wait a minute. *** not in there. *** re - This thing isn't - isn't - isn't - released all the way. Pull it out. This - that's what - Okay. There, you got it.

LMP-EVA It went in.

CDR-EVA Okay. That's the dust again. *** ... the bags, anyway? Let me get the bag out. Okay. Now shove it.

CC Okay, and, Gene, you might get the - -

06 19 44 59	CDR-EVA	That's too much. Wait a minute, wait a minute, wait a minute, wait a minute. Let me - -
06 19 46 39	CDR-EVA	Okay. Let me lift it up and do it. *** Wait a minute. I've got to tweak this thing. Now shove it in. Right now.
	LMP-EVA	*** got it. No? *** play with it, and I'll see if I can change a mag.
	CDR-EVA	Well, dadgummit! That latch is -
	LMP-EVA	...?
	CDR-EVA	I'll lock it. I'll just push that latch - that latch is just sticking, that's all. It's just dust, I guess. I don't know what you do about those problems.
	LMP-EVA	Okay. What magazine did you want, Bob?
	CDR-EVA	*** latched.
	CC	Magazine Mike, as in Mary. Gene, you might spend your time taking a standard 74-foot pan while Jack is changing his mag, if you got a chance there.
	CDR-EVA	That's a splendid idea, sir. And that's exactly what I'll do. I don't mind going uphill because it's so much fun coming down. *** in my little hole here. Oh! That's stability. That's stability. Boy, Challenger looks a long way away. *** kilometers, huh?
	LMP-EVA	Yes.
	LMP-EVA	Okay. Mag's changed.
	CC	Copy that.
	LMP-EVA	Bob, those two bags with the goodies in them will have enough soil to be representative of the area we sampled, too; I think.
06 19 47 48	CC	Okay; copy that. And did you guys get your bags fixed up there, Jack? We were concerned about your SCB for a while.

	LMP-EVA	No. We have to do that.
	CDR-EVA	We'll do it.
	LMP-EVA	Look at my camera lens and see how dirty it is.
	CDR-EVA	*** the other hook that came - Turn a little more left. No, it didn't - It didn't come off, I don't think - unless it - the bottom's off, but the bottom is not going to stay up. And it's not - You're not going to lose it. The tops are so tight you'll - Your bottom's loose, but that - That's because your harness shrunk a little bit.
	LMP-EVA	Okay. How's my lens?
	CDR-EVA	Let me - let me - let me do one - -
	CC	Okay. It looked like, from time to time, guys, that only one of Jack's hooks was hooked. On the top.
06 19 48 37	CDR-EVA	Yes. They're both on, and they're both tight. And I got the bottom hooked again, too.
	CC	We copy.
	LMP-EVA	Yes. Okay.
	CDR-EVA	Bottom - But his bottom is not going to stay.
	LMP-EVA	Okay. Check my lens.
	CDR-EVA	Your lens is beautiful! What's mine look like? Can you see it? I know it's clean. Let's forget it.
06 19 48 57	CC	And, 17, as you get around to the front there, Gene, would you dust the LCRU; we don't think you did that here and the top of the TV camera. And, Jack, would you take a peek at the SEP temperature for us?
	CDR-EVA	I'm sorry, Bob. I already did that when we stopped at the station.
06 19 49 16	LMP-EVA	SEP temperature is about - -
	CC	Okay. It's been done - -
	LMP-EVA	- - 115.

	CC	115. Press on.
	LMP-EVA	Okay.
	CDR-EVA	Jack, this is tied down everywhere. You're just going to have to watch it.
	LMP-EVA	I will. *** in. Hey, we seem to do an awful lot of down-Sun driving for - or up-Sun driving for all the planning we did. (Laughter)
	CC	*** we come home from station 8, then we'll take care of it.
	LMP-EVA	Okay.
	CC	And, Gene, as you get started there, we'd like a couple of Rover battery temperatures; at least one. We know what the other one says. And, Jack, we might get a frame count from you - Oh, excuse me, we already got that; thank you, because it's changed.
06 19 50 44	CDR-EVA	Well, okay, 110; and CDR, by the way, is about 73 on the frames.
	CC	Copy that.
06 19 50 53	CDR-EVA	Okay, Bob. I'd like the range and bearing to the - We're roll - We -
	LMP-EVA	How did you get in reverse?
	CDR-EVA	I don't know.
	CDR-EVA	Okay. We're rolling, and I'd like the range and bearing to the next ***
	CC	Okay. We want a heading of around 1 - we want a heading of around 125, and there's going to be a short - some - a small turn, I think it's at crater - the SWP Crater at 225 and 3.4, there'll be a slight turn.
	CDR-EVA	That's what I'm looking for.
	CC	That's a heading of 125 is what you should start out on.

06 19 51 37 CDR-EVA I thought we were bypassing - -

CC And 225 and 3.4 - -

CDR-EVA I thought we were bypassing SWP.

CC No, we just do that during the mission planning stages.

CDR-EVA 225 and 3.4. Okay.

LMP-EVA That's pretty close to nominal.

CDR-EVA *** got my - Man, I tell you, this little navigation map I've got on my hand - cuff checklist is - is unquestionably the greatest thing that I've ever - done.

LMP-EVA *** hard to tell where north is on it, though.

CDR-EVA Trying my best to keep you out of those slopes.

LMP-EVA That's all right. I'm learning to tolerate it.

LMP-EVA Okay, Bob. We're pretty close now to - no, really not. We're still about 100 meters, I think, from where the break in slope is - with the plane. And - but we're away from the block population except for scattered - two great big blocks out ahead of us, this side of the SWP Crater. And - but the average population is down to the 1 percent or less, again. That average population really never changed up in here. Just the big blocks were around. I saw some little half-meter to one-third-meter, glass-lined, pit-bottom craters.

CDR-EVA Look at the size of those things! Boy, aren't they big mamoos (laughter).

LMP-EVA (Laughter) And it looks like they're probably the same thing that we sampled. They have the inclusions in them, white inclusions. They look like a mixture of gray and the - sort of a tan-gray of the - the gray of the recrystallized breccia, and the tan-gray of the anorthositic gabbro.

06 19 53 53 LMP-EVA That must - Hey, look! There's Van Serg, blocky rim crater. That's the other side of Cochise there. See it?

CDR-EVA Yes. Way over there.

LMP-EVA Yes. Cochise is certainly a shallow crater, although we knew that. It doesn't have any - it only has one place I can see that has any blocks on the inner wall of Cochise. Otherwise, it has a surface much like what we're driving on for walls and for the floor. One place on the south - southeast wall is a concentration of blocks much like we saw in Henry or in Horatio. But the rest of the crater seems to be pretty well mantled. Van Serg is a very blocky rim crater, *** blocks up on the rim.

CDR-EVA Do you have a lot of static, Jack, or is it just me?

LMP-EVA No, I think it's just you. People are always giving you static.

CDR-EVA Bob, if you are still reading me, I'm looking at the Sculptured Hills, and I still have that - that old man wrinkled face appearance, even up close at this Sun angle. And those wrinkles go from, generally, upslope at the west to downslope at the east.

LMP-EVA *** No, you're right at the edge of Cochise.

CDR-EVA *** Right here?

LMP-EVA Yes. Aren't you - -

CDR-EVA No, we're not that close. Uh-uh. Cochise is up at - see that rim where those blocks are?

LMP-EVA No, that's a small crater.

CDR-EVA Oh, I'll bet you that's Cochise up there. We've got to go quite a ways yet to get to - This sideslope driving is really a tough - -

CC *** range and bearing there, guys?

06 19 55 45 CDR-EVA Okay. It's 210/3.4.

CC *** range and bearing. 210/3.4. And you should be somewhat north of Cochise there, as per planning, although you may be cutting south to try going directly up-Sun.

LMP-EVA I guess that's some other - -

CDR-EVA That's just a depression. I think Cochise is over that rim.

LMP-EVA That's just a depression. Yes. *** getting warm.

CDR-EVA Yes, I tell you that. Every bump you go over on that sideslope is just accentuated.

CC Yes, we don't think you're anywhere near Cochise.

LMP-EVA Yes. I agree.

CDR-EVA Yes. I think it's over that rim up there.

LMP-EVA That's just a big, shallow depression.

CDR-EVA All I'm doing is flying the 3.4-kilometer arc right now.

LMP-EVA There's another one of those deep craters that's not - -

CC Say again there, Gene.

LMP-EVA - - that doesn't have a blocky rim.

06 19 56 50 CDR-EVA Okay. 214/3.4.

CC Copy.

LMP-EVA That's one of the more striking characteristics of the mantle are these craters that look, as far as the diameter-to-depth ratio is concerned, like they ought to be fairly young. But there's no blocks on the rim, and they seem to be - have this mantled appearance, just like some of the large craters.

CDR-EVA As I look up Wessex Cleft from just about abeam of it - Let me get over here - It still shows me an albedo change and a surface wrinkle-texture change.

	LMP-EVA	And - yes, I think so. I've got it at the same Sun angle more or less, on part of it there.
	CDR-EVA	It's sort of a perfectly formed saddle in there.
	CC	Yes. Okay. Copy that. You guys may be getting just a little far north. You may want to head just a little south to avoid running right into the middle of SWP Crater.
	LMP-EVA	Yes. I think we see it now. Is that SWP?
	CDR-EVA	Well, I don't know. I don't *** see anything yet. Let's see.
	CC	SWP will be at 22 - SWP will be at 225 and 3.4.
06 19 58 06	CDR-EVA	Yes. That's my - that's what I'm shooting for, Bob.
	CDR-EVA	I'm just flying a 3.4 mile - -
	CC	Okay.
	CDR-EVA	- - or kilometer arc.
	CC	Roger. I was going to suggest that.
	LMP-EVA	Bob, there's something I haven't mentioned, but if one had time on the next program - -
6 19 58 28	CDR-EVA	I think that's SWP right there, Jack. It is.
	LMP-EVA	- - you can sample secondary craters, and they tend to have blocks either in them or on one rim, suggesting that you could tell directions if you put your mind to it. Directions of the - where the secondaries came from. These are small ones.
	CDR-EVA	Did we ever get a piece of glass in place?
	LMP-EVA	Yes, I did yesterday.
	CDR-EVA	Documented in place?
	LMP-EVA	Yes.
	CDR-EVA	Okay.

	LMP-EVA	That's what I was trying to protect in the SRC yesterday.
6 19 59 59	CDR-EVA	Here's SWP, Jack. It's coming right up, and I'll go along the southern rim.
	LMP-EVA	I wish I wouldn't lose - start concentrating. I'm forgetting to take my pictures.
	CDR-EVA	I'll tell you, if we don't concentrate, we end up - -
	CC	Roger, Jack. Don't forget to take your pictures.
	LMP-EVA	Okay. I'll quit thinking and just take pictures.
06 19 59 21	LMP-EVA	There's a crater, that double pit-bottom crater. That's the first one of those I've seen.
	CDR-EVA	Right here, Jack, you're going to be able to peek right over the top of SWP.
	LMP-EVA	Right.
06 19 59 34	CDR-EVA	Right here. How's that grab you?
	LMP-EVA	That's SWP, all right. SWP's a bigger hole than I thought it was.
	CDR-EVA	Right.
	LMP-EVA	SWP even has some blocks in the wall.
	CDR-EVA	Yes, but the eastern and southeastern rim of SWP are just continuous - Oh - they're just continuous with the slopes of the Sculptured Hills.
	CC	Copy that.
	CDR-EVA	How does 238/4.2 sound for the beginning of 8?
	LMP-EVA	Hey, you're -
	CDR-EVA	May have to take these slopes just the most comfortable way we can.
	CC	238 and 4.0 we're expecting for station 8, the beginning of it. 238/4.2 - 4.0, excuse me; 4.0.

	CC	And remember again, station 8 is a very flexible area. You just get to a place where it looks like it's feasible to sample Sculptured Hills.
	LMP-EVA	That's right.
	CDR-EVA	Yes.
	CDR-EVA	Let me tell you, this Rover is a machine. I don't know if it saw that hill we're climbing, but I did.
	LMP-EVA	How's your - how're you doing?
06 20 00 59	CDR-EVA	Doing fine. I'm trying to get around SWP over here and start hitting that - -
	LMP-EVA	East Massif has outcrops on it. I can see now on the north side. And they also tend to have linear upper terminations. And some of those line up as if there's roughly horizontal structure within the upper one-half of the East Massif.
	CC	Okay. Copy that, Jack. Stop thinking and take pictures.
	LMP-EVA	Go by that little dark crater over there. There's a very blocky-rim small crater that's a dark-rim crater instead of a bright rim like we'd seen some around that looked fresh. It partly may be the angle at which we're approaching it.
06 20 02 31	CDR-EVA	Bob, we're on the southeastern rim of SWP at 226 and 3.6.
	LMP-EVA	Why don't we get some samples of that material in there.
	CDR-EVA	Right here?
	CC	Copy that.
	LMP-EVA	*** driving toward the rim and then just - a shallow curve. Okay. Now, curve it.
	CDR-EVA	*** spot?
	LMP-EVA	Okay. Right. Just keep going, and I'll stop you. Whoa, straight in. Good, good.

06 20 02 59	CDR-EVA	Okay, Bob. 226/3.6. There's a - there's a highly fragmental, small crater about 40 - 30 or 40 meters across, right on the southeastern rim of SWP. And at - there's a - Most of the fragments are football size and smaller, and they're very angular. And probably the inside of that rim is - -
	LMP-EVA	Turns out that they'll break. They're clods.
	CDR-EVA	Are they clods?
	LMP-EVA	Yes.
	CDR-EVA	I guess that's going to be about 70 percent covered on the inside of the rim with these things.
	LMP-EVA	It's all instant rock, but the crater rim looks dark compared to - to other fresh craters like this that we've seen.
06 20 03 43	CDR-EVA	50 Yankee.
	LMP-EVA	Frame count is - -
	CC	Copy. 50 Yankee.
	LMP-EVA	- - 26. LMP frame is 26.
	CC	Copy that. Press on.
06 20 03 59	CDR-EVA	Yes, you're - We are; we're rolling.
	LMP-EVA	Yes. Your wheels are just chewing those things up.
	CC	And, 17, we're hoping to go to station 8A, the northernmost section of station 8, if we can, of course.
	LMP-EVA	Yes. I think - I think we ought to head just about - -
	CDR-EVA	Yes. We'll get there.
	LMP-EVA	Well, I think we ought to get below the highest peak up there because that seems to have the rocks on it.
	CDR-EVA	*** one rock down in there.

LMP-EVA ... straight ahead.

CDR-EVA See that one? Of course, I don't know where that came down. Doesn't look like it may have come down from the top.

LMP-EVA Certainly aren't many rocks. It's certainly not like the old North and South Massifs. There's one big rock over there that doesn't look like it might be -

CDR-EVA Well, let's head that way. That's about where the station is, anyway.

LMP-EVA ... I think we're starting to see blocks. That one is so - so unusual -

CDR-EVA That's about the station. That's the northernmost station, anyway. There's another one there.

LMP-EVA Well, this probably is - We can get the other smaller population around it. I'm worried about that one being exotic to the Sculptured Hills.

CDR-EVA Yes, it doesn't look like it rolled -

LMP-EVA No.

CDR-EVA But I don't see any others, do you?

LMP-EVA Well, there's some small ones up in there. Off to about the 2 o'clock position. But I think that's all. We're going to have to be satisfied with small ones. *** ones don't get down. There's some big ones way up on the slope.

CDR-EVA Yes, I see those.

LMP-EVA Watch it; crater.

06 20 05 48 LMP-EVA Yes, let me get it for them.

CDR-EVA Okay. We're at 227/3.9.

CC 227/3.9.

CDR-EVA I think it's worth - There's smaller ones around here, too, Jack.

LMP-EVA Yes. That looks like subfloor from here.

CDR-EVA What's it look like? If it doesn't look worthwhile stopping, I'll move on up over there.

LMP-EVA Yes, it looks like subfloor. I would recommend that we - -

CDR-EVA All right.

LMP-EVA - - try to get up to some of those. I don't know whether we can or not. How's your - what's your pitch indicate?

CDR-EVA Well, that doesn't mean anything.

LMP-EVA See that - those two up there would be reasonably well up the slope.

06 20 06 41 CDR-EVA Bob, no parking constraints on the battery?

CC No parking constraints. We'll park at 045, Gene. Or wherever you like, really.

CDR-EVA No, I have to park about 045 because I've got to be pointing uphill so we can get out. Jack, I'm going to park - -

CC Okay. Either - any place you want to. 045 is fine.

LMP-EVA How about just that rim of that little crater there?

CDR-EVA Well, this is so level right here, Jack, I'm going to just park it - -

LMP-EVA Well, I was just thinking on top of that crater is closer to the - That's level, too, on the rim. It'll give them a view of the - a good view of the sampling area. I think we can - If we work on those blocks there, we're in pretty good shape. Bob, we're directly downhill, and that is from the highest point that I could see up on this first mass - first Sculptured Hill.

06 20 07 38 CDR-EVA Bob, I'm parked at 026; bearing is 226; distance, 6.6; range, 4.0; amp-hours, 85 and 80; battery is 1 - I think it's 115; and motors are all off scale low.

CDR-EVA Not really, but - Okay - -

CC Okay - -

CDR-EVA - -. - 230.

CC And here, we would like - -

CDR-EVA - - on the forward and off scale low, and 220 on the right rear.

CC We copy that. We'd like to get the usual dusting here.

CDR-EVA Yes. And I'm fairly level.

CC Up front.

LMP-EVA Not really.

CDR-EVA (Laughter) I'm not, huh?

LMP-EVA (Laughter) I just about rolled downhill again.

CDR-EVA Oh, man. (Laughter) I am pointing uphill, aren't I?

LMP-EVA Yes.

06 20 08 43 CDR-EVA Well, at least we don't have a sideslope. Battery covers stay closed?

CC And, 17, we'd like - Battery covers stay closed. But we do want the LCRU, and the TV camera, and the TCU dusted.

CDR-EVA Okay.

CC And, 17, we'd like the SEP blankets opened and dusted one more time.

CDR-EVA I think you're a dreamer, Bob, but I'll do it.

CC Roger. We keep hoping.

CDR-EVA *** your thing, Jack. It's going to take me a little while to get this dusted.

LMP-EVA The first block I looked at here looks like subfloor gabbro.

CC We copy that.

CDR-EVA Should have it, Bob.

CC Okay. We've got a picture.

CDR-EVA You even sound better. Battery covers are awful dirty, but I will not dust them as long as you're happy.

CC I don't think dusting the battery covers gives us any cooler batteries.

CDR-EVA Well, I know; but it keeps the batteries from getting dust in them. I've had pretty good luck with them. They've been pretty clean.

CC Roger on that.

CDR-EVA You are dusted; and you're shiny bright all over.

CC Okay. Copy that.

CC We thank you. Ed thanks you.

06 20 11 15 LMP-EVA And we all thank you.

CDR-EVA *** if Ed thanks me, that's enough. A man couldn't ask for any more than that. Okay. I've got my thing - -

CC I think your LMP just ran away.

CDR-EVA *** go? Jack?

LMP-EVA What?

CDR-EVA Oh, there you are. I thought maybe you fell in that crater I'm looking at. Okay. I'm going to give you a TGE reading.

CC Give us a mark.

CDR-EVA Our fender's beginning to fade; and, uh-oh, the clip came off on the inside; that's what's wrong. We'll have to fix that before we start. The outside ones hold but the inside one's not.

LMP-EVA Bob-o, all the blocks bigger than 20 centimeters that I've looked at up here are subfloor gabbro in appearance.

CC Copy that.

LMP-EVA I've looked at about five.

CC Did we get a mark there on the gravimeter, Gene?

CDR-EVA Thirty seconds to go, Bob.

CC Roger. I copied it. Just wanted to check.

CDR-EVA Okay. Jack. You find anything up there?

LMP-EVA Gene, I'm going to go up and look at this one rock. Why don't you set up and sample any one of these other big ones. They're all the same. Like the one near the Rover. And I'll go up and try to get this big one down there.

CDR-EVA Well, okay.

LMP-EVA It's the only one left to look at, but right now we're dealing with subfloor material, I think.

CDR-EVA What about some of these little fragments that seem to be sitting more on the surface?

LMP-EVA Yes, we're supposed to rake here. We'll get those with the rake.

CDR-EVA That one up there, by the way, is sitting on the surface. These others are submerged.

06 20 13 22 LMP-EVA Yes. That's why I want to look at it.

CDR-EVA If you - you won't - You don't have a hammer, but if you need me, I'll come up there because I think that may be worthwhile.

LMP-EVA I'll roll it down to you.

CDR-EVA Yes. Thanks a lot.

CC A reminder, 17. We'd like to have you leaving here in 30 minutes to make up some of the time we spent at station 6 and 7, a little extra. And we'd also remind you that we'd like a rake soil sample here, too. That may be the only way we try and pick up some stuff other than subfloor if that, indeed, has come down from the top of the Sculptured Hills.

06 20 14 19 LMP-EVA Okay, Bob. This rock is a big chunk of shattered, but still visible, bluish-gray anorthosite. It's glass-coated, and it actually looks like it's vesicular. I'm going to roll it downhill so we can work on it. Well, I'll document it first. Did you copy that?

CC Roger. I copy that. We'll be watching it coming.

LMP-EVA Okay. But the point is, as Gene said, it's the only rock, big one anyway, in the area that I see that's perched on the surface as if it might have rolled here.

CC Okay. Copy that, Jack.

LMP-EVA But I don't see a track.

CDR-EVA Man, this one here is tough as a -

LMP-EVA Well, we can get some small ones.

CDR-EVA Yes. That's what I'm going to do. I tell you, this one is so -

LMP-EVA I thought you might be able to break it up.

CDR-EVA Well, there's no - there's no corners on it.

LMP-EVA Ready for this?

CDR-EVA Bob, 563 is the sample.

CC Copy, 563.

CDR-EVA Over here to the - ... - -

LMP-EVA Are you ready? Are you ready for this?

CDR-EVA I'm not sure I am, but go ahead.

LMP-EVA Go; roll. *** I would roll on this slope, why don't you?

CDR-EVA Five-sixths gravity that's missing.

LMP-EVA Hey, I'll bet you they would like, if I didn't step on it, sample out of the bottom of that thing.

CDR-EVA These others all look - You're right, Jack, they look like what we've been sampling. And they're all pretty well mantled except the ones you got up there. There's one more piece I see on the side of that crater that may not be.

06 20 17 44 LMP-EVA Bag 545 will be soil from under that anorthosite boulder. The only thing that bothers me about that boulder being subfloor - I mean at Sculptured Hills - is that it's glass-coated.

CC Copy that.

LMP-EVA It may have been thrown in here by an impact. Oh, you're here.

CDR-EVA *** sample it, and then roll it down.

LMP-EVA Well, okay. I never would have moved it if I thought you were coming up.

CDR-EVA Well, I wasn't coming up; but I looked at some of those others, and there's only one more -

LMP-EVA Okay. Well, I got it documented up in place. Let's - That's not the - I think that's the side that was down. Let me roll it over -

CDR-EVA Well, let me get a piece of that side since it was underneath. Then we'll roll it over and get a piece of the other side.

LMP-EVA Good thinking. Oh, okay; yes. Let's do it again. Except I got dust all over it.

CDR-EVA Well -

06 20 18 54 LMP-EVA The albedo - the down-Sun picture's not going to mean much. Let me get this sample in your bag. I think we ought to change your bag because the stuff's going to start flying out.

CDR-EVA Okay.

LMP-EVA It won't stay closed.

CDR-EVA Jack, after this one, there's only - there's one more in that crater. It may be from that crater, but I don't know.

LMP-EVA How's your hand for hammering?

CDR-EVA Ohhhh!

LMP-EVA This will be easy. This will be easy.

CDR-EVA The old hammering hand -

LMP-EVA This will be an easy one, Gene.

CDR-EVA Two pieces for you.

LMP-EVA Okay. Let me - -

CDR-EVA Oh, that's a pretty one inside!

LMP-EVA Well, it's stained by the glass coating.

CDR-EVA Oh.

06 20 19 36 LMP-EVA It's stained by that glass coating.

CDR-EVA That's a pretty one inside.

CDR-EVA *** that? Here, take my hand. *** I'm going to chop another piece off right here.

LMP-EVA Yes, get more than that.

CDR-EVA Piece right there. You've got three pieces laying around. Let's get those before we lose them.

LMP-EVA Bag 564. Okay. I got it.

CDR-EVA Have you already got them in the bag?

LMP-EVA No.

CC We copy; 564 from the bottom of the boulder.

CDR-EVA Sure that's the bottom, huh?

LMP-EVA Yes, it's got - mixed with local soil. I'm pretty sure. Let's turn it over. I think I'd recognize the top, although it's got dust all over it now.

CDR-EVA I think I'll get one more swap off there. I don't want to seal this. Let me get another swap off there. I can get it.

LMP-EVA Okay. Well, that disappeared. Get it this way.

CDR-EVA One time. That disappeared, too? That probably went into orbit.

LMP-EVA Yes.

CDR-EVA Boy, is that pretty inside. Whoo! We haven't seen anything like this. I haven't. Unless you've been holding out on me.

LMP-EVA No, this is a nice crystalline rock.

CDR-EVA Okay, I see that one.

LMP-EVA Where did that one go?

CDR-EVA That's a good one. I'll go get it with my tongs. That's a good one. That one I worked too hard to get. Hey, I see how it makes boulder tracks. I just made one - it just - it just skipped along, made those little pothole craters as it went.

06 20 22 28 LMP-EVA Hey, Houston. This is a - about a 50-50 mixture of - what looks like maskelynite or at least blue-gray plagioclase, and a very - let's say a yel - light yellow-tan mineral, probably orthopyroxene. It's fairly coarsely crystalline.

CC Copy that. Okay. When you guys get done with that rock, we'd like to get to the rake sample, please. And that's probably just as well done by the Rover as anyplace else.

CDR-EVA Did you get it?

LMP-EVA Yes.

CC We don't seem to see anything worthwhile here doing besides that.

06 20 23 24 CDR-EVA Okay. That went in the same bag, Bob, as the other - rest of the chips from the bottom. *** chips from the bottom are in 464.

CC Copy.

LMP-EVA Here, let me roll it over. Go ahead. Want to put it in?

CDR-EVA Yes.

LMP-EVA Okay.

CDR-EVA Oh, boy.

LMP-EVA By coarsely crystalline, it's - probably, the average grain size will turn out to be about 3 or 4 millimeters, maybe - maybe half a centimeter. Hold this, and I'll - -

CDR-EVA Well, I got to go get a couple of pictures.

LMP-EVA Yes. Yes, we really got that one messed up.

CDR-EVA Yes, I -

LMP-EVA That's all right.

CDR-EVA If you'd hold your scoop where that one came off, it'd help.

LMP-EVA Yes. I was just going over there.

CDR-EVA On that other side.

LMP-EVA Just going over there.

CDR-EVA This side is clear. That last one I took off. Okay.

LMP-EVA Right there.

CDR-EVA Okay, that's good. *** gnomon, and we won't roll it over on the gnomon.

LMP-EVA Watch it. Oh, yes. That other side is the one that was up. Well, I'm not sure now. *** much dust on it. But let's -

CDR-EVA It's not going to roll down that hill unless we got it on edge.

LMP-EVA No. Did it come up to you?

CDR-EVA Well, look at that glass on it. That's what you said, huh?

LMP-EVA Yes.

06 20 25 01 CDR-EVA Which side was the glass on when you looked at it?

LMP-EVA It's on all sides. It's on all sides.

CC 17, there's probably not much point in spending a lot of time out here trying to decide which is the top.

CDR-EVA We're not.

CC It's not big enough, anyway, really to worry about the top and bottom samples. They're radiologically significant.

LMP-EVA Well, let's - If you don't want another sample, then we can go ahead.

CDR-EVA Well, let me get a piece of this glass.

LMP-EVA Righto. *** is. Okay. *** to get them. *** here.

CDR-EVA Okay; a piece of the glass from it, Bob, is 546. With a little of the local soil.

CC Okay. We copy 546.

CDR-EVA Okay. We'll go rake.

CC And now we're ready for you guys to rake, and I guess they suggest a crater rim, if possible. Probably over there near the Rover.

LMP-EVA Okay. Now you got a sample of that big block down there, huh?

CDR-EVA Yes.

LMP-EVA Okay. *** your gnomon. Whoo! Oh, boy.

06 20 27 04 CDR-EVA Bob, on my frame count; 85.

CC Copy; 85 for the commander.

LMP-EVA Too bad I don't have my skis.

CDR-EVA Jack, did you get a pan up here?

LMP-EVA No.

CDR-EVA I'll get one.

LMP-EVA Good; I forgot. I got interested in skiing. Whoo! Can't keep my edges. Little hard to get a good hip rotation.

CDR-EVA Let's see, I must be looking back at *** SWP. Golly, I don't know. I'm looking back at the complex: Cochise and Shakespeare, and I can see the LM. Hey, Bob. One interesting thing up here, you can see the erosional pattern of the talus, the mantle that - I call it a mantle, but the talus that's on the Sculptured Hills, there's little - little boulder tracks of all sizes from all these little clods. And they all, of course, point downhill or nearly downhill.

CC Copy that.

LMP-EVA Hey, Bob. In the interest of time, I'll document this without the gnomon.

06 20 29 05 CC I presume Gene's got the gnomon up there.

LMP-EVA Yes. I should have brought it, but *** about it.

CC Don't forget the gnomon, Gene.

LMP-EVA Don't forget the Gene, gnomon [sic]!

CC And we concur with documenting without the gnomon.

CDR-EVA Whee! Boy, when you do this and you go downslope, that first step is a long one. I'm having - This is the best way for me to travel. Uphill or downhill.

LMP-EVA What's that?

CDR-EVA Like this. Two-legged hop.

LMP-EVA *** Yes.

CDR-EVA And on level ground, I can skip. I don't like that loping thing.

LMP-EVA Oh, the loping's the only way to go.

CDR-EVA Well, when I'm on level ground, I can skip. But this two-legged thing is great. *** cover ground like a kangaroo. Oh, okay. You documented already; I was just going to put this in the field of view, anyway.

LMP-EVA Yes. Here on the after we can have it there.

CDR-EVA *** about that? There's not much in here worth - Man, there's just nothing - This has been totally mantled with talus. Well, it is, because that - that downhill pattern goes right down the slope of this crater, and, actually, it goes upslope of the crater. This may be on a ray somewhere. Because it goes right downhill - this little ... boulder trail pattern goes right up the slope.

LMP-EVA *** those are later than the crater by a long ways.

CDR-EVA Did you - did you *** anything over here.

LMP-EVA No, I haven't done anything - -

CDR-EVA I'm going to pick up the piece out of that little - -

LMP-EVA Yes, get this - -

CDR-EVA - - crater.

LMP-EVA *** gnomon over there?

CDR-EVA No. I'll just take it to it. Let me know when you're ready for a bag.

LMP-EVA Well, I'm about ready.

06 20 31 52 CDR-EVA *** ready?

LMP-EVA Yes.

CDR-EVA Okay.

LMP-EVA I went - I raked about a 2-meter square area - maybe - yes, about 2 meters, and down to 4 or 5 centimeters for these. Pretty good population. *** to go in?

CDR-EVA They're all in; 5 - -

LMP-EVA Wait, wait.

CDR-EVA - - 5 - 565. 565.

CC Copy that. Sounds great.

CC And this is a kilogram soil locations, fellows.

LMP-EVA Yes, sir.

CDR-EVA Jack, your bag is full; we're going to have - No, it isn't, but we ought to change it when we get back, anyway. And that one ought to go under your seat.

LMP-EVA Oh, okay.

CDR-EVA Get your kilogram. I'll be ready to take it. The kilogram is in 566.

CC Copy that. And, remaining here, we'd have primarily a trench. If you fellows think it's feasible, we'd like to be moving in 11 minutes, 11 minutes. And we could use a pan from this lower location also, probably.

06 20 33 25 CDR-EVA Why don't you go back and dig a trench at the Rover?

CC And we could use a pan from this lower location also, probably. Roger. That sounds good to us.

CDR-EVA Jack, why don't you do a trench at the Rover where we just scoop this out - -

CC And we also remind you of getting a pan at the lower section there.

CDR-EVA I'll get the sample here that I got documented now and - -

LMP-EVA Did you? - Is that - Is that all going to go in there?

CDR-EVA Yes, it'll go.

LMP-EVA Can you twist it?

CDR-EVA Yes.

LMP-EVA That rock may have been too much. Take that rock out, and - -

CDR-EVA No, it'll stay. *** put it in mine, though. Well, let me try. Since we're going to unload your bag, this may be the last *** one. That's the last one for your bag.

LMP-EVA Okay.

CDR-EVA Okay.

LMP-EVA Did you get anything out of that little crater?

CDR-EVA No. But I'm going to right now.

LMP-EVA Okay.

CDR-EVA Why don't you get your after picture over there and go down and get that trench. I'll come down -

06 20 34 32 LMP-EVA You don't want a bag? Okay.

CDR-EVA I can - I can bag it - I can do it myself.

LMP-EVA ...

CDR-EVA Boy, almost pure white and very friable. Oh, boy, is it! Pure white. *** a small little pit crater on the side of this crater I just walked in, Houston. And it's pure white, very friable. I got about - well, one big piece and several small in 567.

LMP-EVA The walls of these craters, the big craters around here, that is, the ones that are, say, 15 meters in diameter, tend to be a little bit lighter albedo *** down in the mantled area. I'm afraid those pictures on that rake may be a little bit made - be through a dust-colored lens.

CDR-EVA Yes, they were also in my documented sample here, too. Okay. Where do you want this trench? On the side of this crater? I'll drop my gnomon.

LMP-EVA I don't know. I don't - *** thinking about that. I think - I think we - we - we ought to get out in the inner crater area to see if there's any stratigraphy to the - to - to whatever the talus is.

CDR-EVA Okay, Jack. I'm going to leave the gnomon right here.

LMP-EVA I'll get it.

CDR-EVA And, while you're digging that trench, we've got to pan to get, but I want to fix this fender.

LMP-EVA I guess this - The pan's mine, isn't it, this one?

CDR-EVA Yes, it is. And I want to fix the fender before - -

LMP-EVA Okay.

CDR-EVA - - before we leave.

LMP-EVA Let me know if you need some help.

CDR-EVA Oh, I can get it. It's only the inner one and I'll - -

CC Okay. We agree with that, and you might get us a - you might get us the gravimeter reading there, Gene, while you're at it. And if you have time, you might drop the gravimeter on the ground, and we'll get a reading with it on the ground as well.

06 20 37 30	CDR-EVA	Holy Smoley. The gravimeter's coming up. 670, 096, 001 - 670, 096, 001. *** dropped on the ground, huh? Gently. I can't find a gentle level spot, but I'll *** If it takes pictures - or does it's thing on the Rover, it'll do its thing here. Okay -
06 20 38 06	CDR-EVA	MARK. ...
	CC	... a check - Copy that.
	CDR-EVA	It's fender-fixing time; it's camera-taking-off time. And I think I'll zap myself with a little cool water.
	CC	And how's the trench going, Jack?
	LMP-EVA	Oh, down.
	CDR-EVA	Oh, man; I'll tell you. When you call for cold water, does it come in nicely. Whew! I'm really happy with this fender, really happy with it.
	LMP-EVA	I *** have gotten a wall, now in one place that's standing about 25 centimeters high. It *** no apparent change in the texture of the soil to that depth; except possibly at the lower 5 centimeters, there's some zones that might be slightly more granular. Particle size may be up a little bit.
	CC	Okay. I copy that. Probably just three samples then will be sufficient, then.
	LMP-EVA	I think - I think so. *** four.
	CDR-EVA	Be there in a minute, Jack.
	LMP-EVA	Oh, that's all right. I can probably get started.
	CDR-EVA	Oh, boy.
	LMP-EVA	Need some help?
06 20 40 17	CDR-EVA	No. Boy, we're sure giving this suspension system a workout. *** even see it.
	LMP-EVA	Well, everything's getting awful dusty.

CDR-EVA Boy, everything is stiff. Everything is just full of dust. There's got to be a point where the dust just overtakes you, and everything mechanical quits moving.

LMP-EVA Like scoops.

CDR-EVA I'm not sure whether Detroit would like the fender, but it will sure buy the fix. Okay; it's fixed. And I'm happy; I like it.

CC Okay. Copy that. Roger. We copy that. And copy it again. And we'd like to have you guys moving in about 3 minutes.

LMP-EVA *** luck.

CDR-EVA You need any help you get - bag those samples, huh?

LMP-EVA Yes, sir. I think I do. I can't adjust my scoop to my *** bagging method.

CDR-EVA Let me get back on *** cooling here to - to save some ***. Okay, now.

LMP-EVA Okay - the bottom 10 centimeters - -

CDR-EVA Let met get your bags - I left my camera off when I -

LMP-EVA - - of a - Well, shoot! I didn't take a picture of the trench after I dug it. Let me take one - one shot.

CDR-EVA *** bottom?

LMP-EVA That's the bottom.

06 20 42 25 CDR-EVA Okay. The bottom is in 548. It's very cloddy. Looks very much like the surface we're standing on except it clods up quite a bit more. Can you tell them anything from the trench itself?

LMP-EVA I told them - I talked to them a little bit about it, Gene.

CDR-EVA Okay.

	LMP-EVA	It looked a little coarser grained, but that's all.
	CDR-EVA	*** holds a nice wall, though. That's the kind of wall I expect those core tubes held. *** another one?
	LMP-EVA	Okay. Skim of the upper - We'll see - how well I do - skim sample of the upper - half centimeter. Maybe a centimeter deep. Can you hold this?
	CDR-EVA	I'm going to put it in your bag.
	LMP-EVA	*** fit in there?
	CDR-EVA	Well, there's no choice, right now. Let me see if these little ones will fit in there. Stand by. I want to put this one in there, too.
06 20 43 41	CDR-EVA	That's in bag 549.
	CDR-EVA	Okay. Try again.
	LMP-EVA	Okay. The upper - below that skim, the next 5 centimeters. Put it down, Geno.
	CDR-EVA	I just put it over.
	LMP-EVA	Well, I can't turn it.
	CDR-EVA	550.
	LMP-EVA	And the next 10 centimeters down - Can you get this one too?
	CDR-EVA	Yes. Now, I got to get your bag.
	LMP-EVA	Okay.
	LMP-EVA	Okay. That was the next 10 centimeters, and then the first sample, of course, was the 10 centimeters below that.
	CDR-EVA	And that last bag was 551.
06 20 45 05	CC	Roger. Copy that. We're ready for you guys to move out.
	LMP-EVA	Okay.

CDR-EVA *** a pan here - while I clean up the Rover, you can get a - get your after of the trench in the pan.

LMP-EVA I will.

CMP-EVA I'll get the TG and clean up the Rover.

LMP-EVA What's the key that keeps - -

CC That's affirm. We agree with that.

LMP-EVA I keep getting keyed.

CDR-EVA It sounds like Bob's stepping on his foot mike.

LMP-EVA Yes, he's so excited he can't stand it.

CDR-EVA You done with the gnomon?

LMP-EVA Yes. Okay. I'll get the pan.

CDR-EVA You get your pan, and I'll get the TG and clean up.

06 20 45 43 LMP-EVA Where - you took a pan up the hill there?

CDR-EVA Yes. I took it way up there, somewhere.

LMP-EVA Okay. I'll take it right here, then. Uh oh.

CDR-EVA What?

LMP-EVA Sample came out.

CDR-EVA The sample came out?

LMP-EVA I'll pick it up.

CDR-EVA Yes, your - your top came open. It's awful full, Jack. If you can't get it, I'll get it with the tongs.

LMP-EVA Go ahead and go to work, and I'll *** pan first. I lost two of them, I guess.

CDR-EVA Yes, those are the last two I put in there. They just - your bag is so full they won't stay. *** them a reading here. Hey, Bob, can I move it on the Rover and then give you a reading? *** can I'll do it.

CC As long as you're careful not to hit the button while you're doing it.

CDR-EVA I won't hit the button. Just easier to do it that way. I don't know why I asked you; I know I can. Even this thing doesn't want to go on; it's so dusty. Okay.

06 20 46 36 CDR-EVA It's on and it's locked, and here's your reading. 670 - 670, 117, 301 - that's 670, 117, 301. I've got to dust that thing the next time around.

CC Okay. We copy that.

CDR-EVA We've got to do some bag changing here. I'll get those things with my tongs. You can't get them - You'd have to bend over. *** you jump around, you come close to losing something. I'll just take them back there. Put them under the seat.

LMP-EVA Okay. You want me to take that one?

CDR-EVA No, I got it.

LMP-EVA Okay.

06 20 47 43 CC You got another one dropped there, Gene - Jack got it.

CDR-EVA ***

CC Jack's getting it.

CDR-EVA *** we've got to make a place in here for your - that full bag. *** small can over there, and core tube over there.

LMP-EVA *** sample.

CDR-EVA *** take your bag off first.

LMP-EVA Well, you might as well fill it as full as you can.

CDR-EVA Yes, I am. Holy Smoley. (Laughter) Turn - turn to the left. *** off. Let me fill it.

LMP-EVA Your bag isn't in much better shape.

CC Roger. We'd like to have you check the commander's bag. You might put them both under the seat there.

LMP-EVA Well, we're running out of bags, aren't we?

CC Okay. We've got one bag left - we should have there.

CDR-EVA Okay.

CC It was on the gate, right?

LMP-EVA Yes. We - we could have put it under the seat.

CDR-EVA Okay, bag number 4 - bag number 4 is - is absolutely full *** under Jack's seat.

06 20 49 41 CC *** suggest that you take the other bag that's on the gate there and put that on either you or Jack. And also, the commander's bag is pretty full also, we suspect.

LMP-EVA Why don't you put it on me? Mine gets full faster ***

CC You might check Gene's bag anyway.

LMP-EVA Stay there, stay there.

CDR-EVA I'm trying to get the bottom hook.

LMP-EVA Oh, I'm sorry. I checked it. He's got about six samples to go. And I just want to be sure that it's locked down.

CC Okay. And - -

CDR-EVA Turn to the left so I can get this other hook.

LMP-EVA Okay.

CDR-EVA It's not coming out; I guarantee you that. Now - -

	LMP-EVA	Let me check yours one more time.
	CC	Okay. And SCB 5 is one for the LMP if you want to take it off the gate.
	LMP-EVA	I got it.
	CDR-EVA	SCB-5 is on the LMP. *** nothing on the gate.
	CC	Copy that.
	LMP-EVA	Well, I think that'll stay down, but it's not very good - -
	CDR-EVA	Okay. I've got one more loose sample I'm going to throw in the big bag back there. ...
	LMP-EVA	A local one, you mean?
	CDR-EVA	Yes. Well, let me leave it under your seat.
	LMP-EVA	Now, let's - Can I put a bag around it?
	CDR-EVA	No, it's got a bag around it. It's all bagged. *** there.
	LMP-EVA	Okay; that's good enough.
	CC	Okay. Jack, while Gene's doing that, why don't you read the SEP temperature, or somebody read the SEP temperature anyway, and close the blankets.
	LMP-EVA	Okay. I'll do that.
	CDR-EVA	Okay, Bob. Let's see, you got your readings - -
06 20 51 19	LMP-EVA	120, Bob, 120.
	CC	*** 120.
	LMP-EVA	*** blankets just aren't staying closed.
	CDR-EVA	Okay. I guess we're ready to head on out. Do you agree?

	CC	Okay. And, Gene, when you go to change the - when you got to change the LCRU, we'd like you to turn it to OFF - O-F-F, on the POWER switch, the INTERNAL POWER EXTERNAL switch. And we'll be reading you through the LM. It will give you a chance to cool down the LCRU on the way home to station 9.
	CDR-EVA	All right.
	LMP-EVA	And, Houston, *** the temperature limit on the DSEA?
	CDR-EVA	Do you read us, Bob, through the LM?
	CC	We read you through the LM. Do read us through the LM?
	CDR-EVA	Yes. Not as well, but we're reading you.
	CC	And the temperature limit, Jack, is 160. We'll just leave it as is until we get back to the LM.
	LMP-EVA	Okay. I was going to say, we could take it out and put it under the seat or something, but that sounds all right.
06 20 52 50	CDR-EVA	Okay. An EMU status check. I'm at 3.***8, and I got 48 percent, *** flags, *** INTERMEDIATE cooling.
06 20 53 02	LMP-EVA	And the LMP - -
	CC	Copy that.
	LMP-EVA	- - is at 47 percent, no flags, **.8*** Hey, Gene?
	CDR-EVA	Yes.
	LMP-EVA	What - Well, Bob, I guess - remind us to change the LRV sampler *** next station. It's almost out of bags.
	CDR-EVA	Well, let's do it next time around.
	CC	Okay. When you get on, Jack, you can give me a frame count as you start moving.
	LMP-EVA	Yes. *** on. *** help?

CDR-EVA Nope.

LMP-EVA Go downhill. Get your feet downhill.

CDR-EVA Yes.

LMP-EVA Okay. Let me help you.

CDR-EVA (Laughter)

LMP-EVA *** it. There's a crater right behind you.

CDR-EVA I got it. I got it.

LMP-EVA Here. Grab my hand.

06 20 54 09 CDR-EVA Okay, now, just push up on my head.

LMP-EVA I'm not going to do it too hard. *** backwards.

CDR-EVA Just push up.

LMP-EVA Okay?

CDR-EVA Okay.

LMP-EVA Boy, are you - you got your pockets completely filled with dirt.

CDR-EVA Well, extra samples.

LMP-EVA Do we throw those pockets away this time around?

CDR-EVA Extra sample.

LMP-EVA Are you a mess!

CDR-EVA Well, that one was coming for a long time.

LMP-EVA My hands are already tired from dusting you.

CDR-EVA That one was coming. I keep trying to blow the dust off my camera, which is very frustrating.

LMP-EVA *** ineffective, too.

CDR-EVA Okay. Do we try that trick again? *** happened on an upslope getting on the Rover. I'm all locked in. Let me know when you are. How come we aren't deploying any charges? I guess the last one - I remember when that one is.

LMP-EVA Okay.

CC *** one at station 10.

06 20 55 29 CDR-EVA Okay. We're heading to station 9 *** about 267. Okay, and they're reading us through the LM, so I won't worry about the low gain. We're powering up. The switch is on. Okay, I'm going to make a turn to the right.

CC And the updated headings, since you're at the north end of station 8, will be something like about 240.

CDR-EVA Okay, Bob. 240.

LMP-EVA Bob, I think your *** sample here at the Sculptured Hills, is going to have to *** tale combined with the observation that most of the blocks we saw were, like Gene sampled, looked like subfloor gabbro. It's conceivable that the Sculptured Hills could be the same kind of material. I think it's fairly clear that the boulder population does not resemble the massif population at all.

CC Copy that.

LMP-EVA (Laughter)

CDR-EVA You been riding on this downslope all the time?

LMP-EVA (Laughter) Yes, but - -

CDR-EVA And you hadn't said anything, huh?

LMP-EVA Scary, isn't it?

CDR-EVA *** glad I'm driving. (Laughter)

06 20 57 03 CC Okay. And, Jack, when you're not holding on with two hands, we'd like the frame count from you.

	LMP-EVA	Yes. *** Serg over there?
	CDR-EVA	Ahhhh - I think it's - -
	CC	You have a bearing of 234 and a range of 2.1.
06 20 57 27	CDR-EVA	Okay. *** get around *** here and then - -
	LMP-EVA	Well, let's - yes.
	CDR-EVA	- - and then head on more westerly.
	LMP-EVA	LMP frame is at 80.
	CC	*** 80.
	CDR-EVA	SWP or Bowen, I mean - Bowen, I guess that is.
	LMP-EVA	Well, *** SWP over there. Bowen is out here ahead of us.
	CDR-EVA	Yes. ... he said two - -
	LMP-EVA	Bowen - Bowen isn't much of a crater on the map.
	CDR-EVA	- - 225 - What did you say, Bob? 225 what?
	CC	*** 4/2.1. Heading ought to be about 240; 240 for a heading for there.
	CDR-EVA	Did you hear him? I didn't hear him.
	LMP-EVA	240. Are you not reading him?
	CDR-EVA	But what did he say for bearing and range? That's what I'm interested in.
	LMP-EVA	240 heading. State bearing and range, Bob. 234/2.1.
	CDR-EVA	Okay. I got that.
	CC	*** think you're even farther north than I was saying. Maybe it's about 215 would be your heading for there.
	CDR-EVA	Okay, Bob. I'll find it. 234/2.1.

06 20 58 56	LMP-EVA	And all the big blocks still look like subfloor from the Rover. *** big blocks in here are only about a - a third of a meter in diameter. *** subrounded to subangular. *** up on the plains again now, just off the break in slope.
	CDR	That sure looks like - looks like outcrop out there on the East Massif on the lower slopes of it where the high albedo is. Doesn't it? *** there?
	LMP-EVA	Yes - Yes. Yes. It does *** guidelines for the geophone deployment *** points *** that blue-gray rock there in the east end of the South Massif down low. Looks like it might have been a slump block or something.
	CDR-EVA	Yes. You can see it's blue-gray because of its contrast with the light mantle.
	LMP-EVA	Yes. It might be a slump block, or something - like that.
	CDR-EVA	Jack, I'm going to go to the left.
	LMP-EVA	You going to go soon? (Laughter) *** 234 - -
	CDR-EVA	No, no. I'm going over here. This is closer. That's a shorter cut.
06 21 00 04	LMP-EVA	That's probably Bowen there, don't you think?
	CDR-EVA	I think - -
	LMP-EVA	Oh, well - -
	CDR-EVA	Well, see, we never got too far - -
	LMP-EVA	We never got very far from SWP.
	CC	How about a - how about a range and bearing, guys.
	CDR-EVA	Maybe we got too far east. Okay. It's 22 ***/3.4. *** moving along at 10 to 12 clicks. That's all it'll hack.
	LMP-EVA	***rain again.

CC How about an amps reading? We haven't had one of those for a couple of days.

LMP-EVA Got a crater ahead of you.

CDR-EVA Oooh, boy.

LMP-EVA Down-Sun isn't much easier than up-Sun.

CDR-EVA It's just easier on the eyes. You just can't see any more, that's all.

LMP-EVA Have that static, huh?

CDR-EVA No.

LMP-EVA *** still got an antenna; I haven't looked recently.

CDR-EVA *** no holes in the high gain.

LMP-EVA *** it on a rock.

CDR-EVA Oh, boy.

LMP-EVA Okay. The - we're back into the mantle area population of fragments is still *** percent or so. The crater off to our left, which is at 227 and 3. *** 3?

CDR-EVA 3.3; 227/3.3.

LMP-EVA Is a fairly good-sized depression, but it's completely mantled. There's no blocks showing in the wall at all. *** read, Bob?

CC *** listening.

LMP-EVA Now there's that crater in the wall of that depression or *** near it. And it has one big block in the side as if it penetrated the mantle and exposed some of the wall of the depression. *** about a 30-meter crater. Valley of Taurus-Littrow is not planar.

CDR-EVA No, it isn't.

LMP-EVA *** we changed it to a subfloor instead of a *** unit.

CDR-EVA (Laughter)

06 21 03 16 LMP-EVA Okay. We're in the inner wall of the depression here, and the rocks still look like subfloor gabbro. *** certainly not much variety. *** few exotics.

CDR-EVA Ooh, now that's got to be Cochise.

LMP-EVA Ah, look at Cochise.

CDR-EVA That's Cochise. Get yourself a couple of pictures while you're looking right at it.

CC ... coming up on Cochise.

LMP-EVA Could you swing right? Swing right.

CDR-EVA Bob, we are on the *** - or northeastern rim of Cochise. I'm going to work my way around the other side.

LMP-EVA And, Bob, looking at the - -

CC Copy that.

LMP-EVA - - western wall of Cochise, *** see a contact within the subfloor between albedo *** one of which is a light tan-gray and the other is a light blue-gray. May reflect the two kinds of subfloor gabbro we've already sampled. Vesicular and nonvesicular. And that contact *** like it was dipping - apparent dip in the wall - was to the north. And the west wall dipping to the north about 20 degrees.

CC Copy that. What - which one's on top? *** tell?

LMP-EVA Yes. The blue-gray's on top. I'm sorry. *** picture of it - -

CC Thank you. And you got a bearing and range there at the rim of Cochise?

06 21 04 54	CDR-EVA	Okay. We're at 228/3.0, and we're not - we're headed south and not quite on the - on the east rim.
	CDR-EVA	I'll give you a hack at the east rim.
	LMP-EVA	Bob, I got a - a picture of that contact so.
	CDR-EVA	I took some pictures right into Cochise, too, when we were coming up.
	LMP-EVA	Good. It'll show on yours, too, probably - I hope.
	CDR-EVA	Okay. We're sort of on the inner -
	LMP-EVA	Quick; give them a mark.
06 21 05 35	CDR-EVA	MARK. 230/2.9. We're on the east rim.
	CDR-EVA	We're sort of inside the east rim a little bit.
	CC	Copy that.
	LMP-EVA	We're halfway between the rim and where the blocky wall starts.
	CC	Well, don't get too far inside.
	LMP-EVA	Did you get that, Bob?
	CC	Copy that. *** that.
	LMP-EVA	Cochise is much like Horatio and - actually, more like Camelot, *** not as blocky in the walls, in general, in that it *** blocky walls but a mantled rim. *** blocks down to about 20 centimeters are subangular, in general, and appear to be the - have the appearance of the subfloor gabbro, although most of the smaller rocks are not - do not appear to be highly vesicular.
	CC	All right. We're copying that all.
06 21 06 52	CDR-EVA	We're at 232 and 2.7.
	CC	Roger. Copy that.

LMP-EVA *** it.

CDR-EVA You know why - you know what happened there?

LMP-EVA What?

CDR-EVA I was just about to take a picture, and the minute you take your eye off anything -

LMP-EVA Yes. I got another view of that contact, and let's put that - *** that on the northwest wall of Cochise and dipping to the south ***

CDR-EVA *** and east is to our left.

LMP-EVA No, no, no, no, no. Put it on the northwest wall *** to the northeast.

CDR-EVA That's right.

LMP-EVA Geno, can you see that over there?

CDR-EVA Oh, yes. I can see it now between the gray and blue-gray?

LMP-EVA Yes.

CDR-EVA Oh, yes. I sure do.

LMP-EVA Can you swing in there, and let me get another shot of it?

CDR-EVA You betcha.

06 21 08 28 CDR-EVA *** good view right here.

LMP-EVA Okay now, I need to have you go left.

CDR-EVA Okay. I got two of them in there, too.

LMP-EVA Great.

CDR-EVA Look at that rock right in front of us. It looks like a contact between a blue and a gray.

LMP-EVA Oh, yes, there it is. Yes, you're right.

CDR-EVA We can't get down it it, but take a picture.

LMP-EVA Well, I think we've done - I think we've got that relationship. I think we got it at station 1, as a matter of fact.

CDR-EVA But that's a big beautiful boulder on the - -

LMP-EVA Yes, that's - -

CDR-EVA - - inner rim - -

LMP-EVA - - that's ... a block.

CDR-EVA - - inner south rim of Cochise.

LMP-EVA Oh - -

CDR-EVA It's a single block.

LMP-EVA That's how you bend your tires.

CDR-EVA Well, that's what it's for. Oh, that's a mou - Oh, man, would that be ... - -

LMP-EVA Well, now, that might be glass covered. That might be a glass coating, the way it sort of hangs on the outside there. ***.

06 21 09 18 CDR-EVA *** at 234/2.5.

LMP-EVA Starting to sling dust. I wonder if we've lost our fender.

CDR-EVA No, they're on there tight.

LMP-EVA You think that's Van Serg?

CC Roger. Copy that.

LMP-EVA There it is.

06 21 09 36 CDR-EVA *** think you're right because that's just about the right place. Let's see, 234 - *** is where - and 2.1 is where we want to go, and I'm at 230/2.5.

LMP-EVA Okay; our - -

CDR-EVA Pretty close.

LMP-EVA - - our block population in - here now on the south rim of Cochise and it's - and up ahead of us *** it's up to 5 percent. And it's - all looks like subfloor - light to tan subfloor gabbro - or tan-gray. *** much blue-gray; *** on here.

LMP-EVA *** recent hit.

CDR-EVA This Rover is getting tested for what it was built for now. I'll tell you, it handles just the way as advertised, maybe even better.

CC Okay. We think you guys are getting to the point we ought to swing a little bit west - -

CDR-EVA Yes, I am, Bob.

06 21 10 51 CC - - to make that 232/2.1.

LMP-EVA We've got it. Tallyho.

CDR-EVA Bob, that sounds good. I'm just navigating to it. *** where. I'll get there.

LMP-EVA *** Tallyho on Shorty - I mean of Van Serg. How about through there, Geno. Thanks.

CDR-EVA You want 234/2.1. Okay.

CC Let's not prejudge the crater too much.

CDR-EVA *** wander factor in here has got to be 50 percent.

CC *** about parking on the south-east rim.

LMP-EVA Bob, you're cut - you're being cut out. I can't tell what you're saying. Isn't that where we want to go, over there?

CDR-EVA 23 - Well, - -

LMP-EVA Well, look - -

CDR-EVA We saw the crater. We saw the crater. It's right there on our right.

CC 234 or 232. It doesn't make much difference, 17. If you see Van Serg, that's what we want.

CDR-EVA Well, you're - Let me wander over that way. That's where I want to get, but I couldn't go there because of that - -

LMP-EVA There's a different looking rock there.

CC And remember, we're talking about parking on the southeast rim.

LMP-EVA *** think you're going to have to bear right.

CDR-EVA Yes. That's why I - I've got to get through this field, though.

LMP-EVA Yes, I know (laughter).

CDR-EVA Okay, Bob. We're still primarily in an *** block field here now. It's up to a 20-percent cover, and - of fragments, mostly the subfloor. Some of it looks quite highly shattered. There's - I just saw one piece that looked like a white anorthositic rock. How's this look to you? We can go farther up there, I guess. Let me go farther up.

LMP-EVA Well, okay. If you can get up.

CDR-EVA *** little farther on the southeast.

LMP-EVA *** apt to overdo it.

CDR-EVA Okay.

LMP-EVA There are - there is some - some grayish rocks that are - -

CDR-EVA Oops! I centered. *** coming up here. *** right and park right here.

LMP-EVA - - that have a - somewhat of a swirl texture.

06 21 13 08 CDR-EVA Okay, Bob. We're at 230/2.2.

CC Copy you parked.

CDR-EVA *** 230 on that? *** bearing is 230/2.2, and I'm parked on a heading of 320, which gives you a better view.

CC Copy 320 for the parking.

CDR-EVA Yes, 3 - 330.

LMP-EVA Oh, boy. *** harder and harder. *** also. *** what's wrong with it now. I might have got it twisted.

CDR-EVA Here, let me look at it.

LMP-EVA *** hooked, but not so I can get it undone.

CDR-EVA Here let me look at it. I'd say stay put, but I don't think you have any choice.

LMP-EVA That fender just curled under. That's where we're getting the dust. *** warp.

CDR-EVA *** other fenders, talk about warping.

LMP-EVA Did I get it twisted or something?

CDR-EVA Yes, you did twist it when you put it on. Okay; squanch down.

LMP-EVA I'm squanched.

CDR-EVA Okay. *** twist in it.

LMP-EVA *** makes a difference.

CDR-EVA Sure does. Here. Your footpan's down, too.

LMP-EVA *** lost its stiffness in there. Okay. I guess now I'll plan for Shorty, huh? *** Van Serg.

CDR-EVA *** POWER's ON - -

LMP-EVA Van Serg looks like a blocky rim, fresh-impact crater right now. Slight differences.

	CC	Okay. We copy that. How about scuffing your feet and seeing if it looks orange underneath?
	LMP-EVA	Don't worry.
	CC	And, Gene, before you go away, we'd like the rest of the Rover readouts, like the batteries. And how about a SEP temp readout before one of you guys leave there?
06 21 15 43	CDR-EVA	Get - Can you get that on that side, Jack?
	LMP-EVA	I will.
	CDR-EVA	Should have TV.
	CC	Roger. We have it, and I'm sure that Ed would like a good dusting job up front.
	CDR-EVA	Well, there's so much - -
	LMP-EVA	I'll dust it if you can't read it. I'll get it.
	CDR-EVA	- - dust. I've got it.
	LMP-EVA	I'll get it.
	CDR-EVA	*** the gage. It's about 12 - 125 on the SEP.
	LMP-EVA	Boy, everything is really bad now.
	CC	Copy that.
	LMP-EVA	The fender warped.
	CDR-EVA	Yes, the fender cut - dug under. See if you can straighten it out. Okay. Amp hours, 82 and 80.
	CC	Okay; and leave the cover - -
	CDR-EVA	*** 122 and off scale low. Forwards are 210, 240. Rears are 225 and 2 - 220.
	CC	Okay. We copy that.

CDR-EVA That's just a sample of the kind of - kind of dust we would have got, Jack, if we hadn't of had that fender yesterday. *** almost worn out.

LMP-EVA *** get a dustbrush, and let's check our camera.

CDR-EVA *** you are, and I'll give you a zappereno *** are.

LMP-EVA Okay; how many bags do I have?

CDR-EVA I don't know, but I've got a lot of dusting to do here.

LMP-EVA *** a lot of bags?

CDR-EVA Yes. I must have *** four of them is all.

LMP-EVA I'd better change my bag.

CDR-EVA *** read the Rover.

LMP-EVA *** an empty bag on me now, right, a collection bag?

CDR-EVA Empty.

LMP-EVA *** time do we have here?

CC Okay, 17. We're looking at a nominal station 9 here. You've got about - -

CDR-EVA *** such thing as a nominal station anymore.

CC *** be the first and only one of the traverse.

LMP-EVA *** geology won't let it be nominal. Hey, I've got some new bags, Bob. And I guess I'm pretty good on film.

CC Okay. We copy that, Jack. Okay. And you're going to get a radial sample here, so you might check your Rover sample bag supply.

LMP-EVA That's right. I want to take that.

CC *** check it to make sure you're okay.

06 21 18 32 LMP-EVA I just did, and it's 123.

CC *** enough.

CDR-EVA *** want the SEP blankets?

CC *** closed, please, Gene. As closed as they'll get.

LMP-EVA CLOSED.

CDR-EVA *** riding with this thing off?

LMP-EVA What? *** should be off.

CDR-EVA Yes, it is. *** get much data that way. Even if it's hot. *** worried about getting it so hot it - -

CC It's automatic. It turns itself off when it gets above 108, so it's not good anyway.

CDR-EVA Are you kidding? We're - oh, boy.

CC *** all day - It's been off all day. We've been hoping that it would - Since station 6, we've been hoping that it would cool down so that we could get some more data, but it's not, obviously.

CDR-EVA It's not going to make it, Bob.

CC That's obvious by now.

CDR-EVA *** that's a shame.

LMP-EVA This is starting to look like a geological survey expedition. The vehicles are all covered with dust. *** what's in there.

06 21 20 14 CDR-EVA I don't think I can read that, unless I dust it with a lens brush. Okay. Get my *** get by you here?

LMP-EVA My - My bag look all right to you.

CDR-EVA Yes, it's still closed.

LMP-EVA Okay. Okay. What are we going to do here? We're going to go up there and sample on the rim, *** the floor, and miscellaneous, and - -

CDR-EVA Well, we are on the rim ...

LMP-EVA - - then you're going to take 500 millimeters when you get back to the Rover while I do a radial sample.

CDR-EVA Okay.

LMP-EVA *** first thing we do is go up to the crater. Bob, I think the mantle objective here really is immaterial and - because the - there's - the blocky ejecta around the crater covers - oh, boy - Well, it looks like it - it extends several hundred meters out from the rim - say a couple of hundred meters. We're quite a ways - we're pretty close to the rim.

CC Copy that, Jack. We can see that.

LMP-EVA *** up on the rim, Gene, and see what we've got. Tiptoe through the tulips (singing) - -

CC *** before you guys leave.

LMP-EVA (Singing) I'm getting it right now. *** anything else you want me to do while I'm here?

CC Negative.

LMP-EVA Sure look like shocked rocks to me.

CDR-EVA *** glass splattered on some of these, Jack.

LMP-EVA Yes.

CDR-EVA We might even find some shatter cones. But don't tell anybody.

CDR-EVA Well, I'll say one thing for old Van Serg, it's blocky. Whoo!

06 21 23 20 CDR-EVA MARK. Gravimeter.

CC *** that.

LMP-EVA This is about - I think this is the only clearly - well, I won't even say that. This is at least a blocky - a large blocky rim crater. But even it

has the mantle *** ma - material covering the rim, *** buried rocks. *** down on the floor, as near as I can tell, *** the walls. The crater itself *** central mound of - of blocks that's probably 50 meters in diameter - That's a little high - 30 meters in diameter. *** the blocks are - -

CDR-EVA Holy Smoley!

LMP-EVA - - intensely shattered in that area, as the ones that are on the walls. *** see any *** organization of the blocks in the walls right now. *** possibility that on the west wall, there's an indication that there's slightly darker gray rocks *** about halfway down the crater. And that's - That level is coincident with what appears to be a bench on the northwest wall. And that bench - hints of that bench - *** continuous, but hints of it are around on the north wall and *** right below us - Yes, on the southeast wall. The *** rocks are pretty badly broken in many cases. And - well, I haven't seen any real glass yet. *** start looking at them a little more carefully.

CDR-EVA That looks like a breccia right there in front of us.

LMP-EVA Yes. There's some interesting patterns on the surface.

LMP-EVA Wait, wait, wait. *** Geno, but - -

CDR-EVA Okay?

LMP-EVA *** I haven't been doing my duty on locators occasionally.

CDR-EVA *** got it.

LMP-EVA *** apart one of the - -

CDR-EVA There you go.

LMP-EVA - - very intensely fractured rocks. And it comes off in small flakes. *** this one because this will be the best oriented one for documentation, plus why don't you get that one you've got inside there.

CDR-EVA Yes, I am.

06 21 27 11 LMP-EVA Got a bag? Bag 568 is a fragment from the surface. That's a corner, I think, off the block that Gene documented here.

CDR-EVA Yes; it is.

LMP-EVA We'll get another sample - that'll be from inside the block.

CDR-EVA *** real easy. Here's a whole big - we ought to take that just as is.

LMP-EVA *** put it in your - put a bag around *** one end if we can. Here the other end is smaller.

CDR-EVA Yes. Hold this - -

LMP-EVA Let me hold this end. *** you put the bag on.

CDR-EVA That's breccia, too. That's - -

LMP-EVA Well, it's - -

CDR-EVA Well, see that? See the white fragments in there?

LMP-EVA Yes. It certainly - -

CDR-EVA It's got a lot of very small - -

LMP-EVA It - it looks like this big one over here. You know, it might be that the - these are - might be pieces of the projectile. I don't know. Because it doesn't look like - It's not subfloor.

CDR-EVA *** down.

LMP-EVA *** wrapped in *** if you put it end down, it may stay in the bag.

CDR-EVA I doubt it.

LMP-EVA What's the number?

06 21 28 43 CDR-EVA It's a 480, and it's a - a relatively tubular [sic] shape, and it's about - -

LMP-EVA And it's going to - -

CDR-EVA - - 10 inches long.

LMP-EVA And it's highly friable. *** apart.

CDR-EVA Oh, not so much.

LMP-EVA In small chips. Well, you can - you did it with your hands there. I call that being friable, compared to what we've seen anyway.

CDR-EVA *** let me get an after of that.

LMP-EVA Let me get a - soil - soil right over here. The soil next to the boulder, down about 3 centimeters, is in bag 569.

CC *** that.

LMP-EVA *** the soil and chips *** two-thirds of a meter from the boulder - -

CC *** that.

LMP-EVA - - *** in bag 570.

CDR-EVA *** here. You're going to step on your gnomon there.

LMP-EVA I wouldn't step on my gnomon. *** very clearly, is a central mound. And now that we've looked at this one, the mound looks like it's composed of gray fragment breccias much like what we've just sampled - -

CDR-EVA Jack.

LMP-EVA - - dark gray. And again it might be related - -

CDR-EVA Oh, excuse me. I didn't hear you.

LMP-EVA - - related to the projectile. *** got to see if there is subfloor up here, or whether we're dealing with another unit somewhere.

CDR-EVA *** after. I don't see any - -

LMP-EVA Well, the more coherent rocks - This looks like subfloor.

CDR-EVA I don't see any orange material either.

LMP-EVA Not yet.

CDR-EVA This particular rock we've sampled has tabular fractures, and in one-half of the rock, they are definitely oriented.

LMP-EVA Boy, I'll tell you, I don't - There's more dust on these rocks. *** to see a fresh surface. They're not as clean. That's subfloor.

CDR-EVA *** even the floor of the crater is mantled down there.

LMP-EVA You know, that seems - Yes. That seems liky a - What you got? A piece of glass?

06 21 31 49 CDR-EVA Yes, I think it is glass. *** it's glass covered - just glass covered. *** I've got an undocumented sample. It's about 2 meters left of where we just sampled. It's a glass-covered *** baseball-size rock in 571.

06 21 32 12 LMP-EVA *** of these blocks up here *** are *** the more fractured ones, but even some that aren't *** a gray matrix *** breccia. And it looks like - Really, the fragments are quite fine. There are no *** rim anyway, we haven't seen any large fragments. The largest I've seen is about 2 centimeters. But down in the mound you can see some fragments that are probably half a meter in diameter.

CDR-EVA Jack, are you going around that rim of the crater up there?

LMP-EVA I was just looking at rocks.

CDR-EVA Well, okay.

LMP-EVA We - we - -

CDR-EVA I want to get a pan before we leave back there.

LMP-EVA Oh, yes. We need to see if - we can get some of the subfloor. I'm not sure I understand what's happened here, yet. This should have brought up subfloor according to the theory, and it hasn't.

CDR-EVA That looks like some of the - look at some of the breccias - the blue breccias with the white *** slabby white - with the fracture face with the white inclusions.

LMP-EVA Down there.

CDR-EVA Yes, down in the floor, Jack.

LMP-EVA Yes, it has that appearance all right. Hey, Gene. Do you see that rock - -

CDR-EVA That's a - -

LMP-EVA - - that rock that's fractured in sort of a pyramid shape down there? Out here on the right - the right end of - of the floor down there - that big one?

CDR-EVA Yes.

LMP-EVA It's sort of pointing west.

CDR-EVA Yes.

LMP-EVA It's pointing east. That's a unique fracture, isn't it? And there's another one that's fractured almost in a - -

CC Roger, 17. And we'd like to be moving from here in about 10 minutes, so we probably better be trending back toward the Rover, unless you're seeing something really great out there.

LMP-EVA Well. Hey, Bob, we ought to - we ought to find out whether or not we got - whether - what the rock is here, if you've got a little time.

CDR-EVA Jack, let me put this in your bag and - -

CC Roger. You got - you got 10 minutes. I'm just telling you to start thinking about getting back.

LMP-EVA Yes. We're always thining that way.

CDR-EVA Okay, Bob. One thing I noticed we do uncover. There's a lot of - oh, *** 3, 4-millimeter-size fragments of glass we're kicking up all over the place.

LMP-EVA Yes.

CDR-EVA Little glass balls.

LMP-EVA Hey, Gene?

CDR-EVA Almost like Pele's -

LMP-EVA Gene?

CDR-EVA Yes.

LMP-EVA Can you come over here? I think there's some subfloor here. We ought to - -

CDR-EVA Okay.

LMP-EVA - - try to document it. But I tell you, most of the rocks are the - are the fine-fragment breccias. Let me see if I can't get one of those little - -

CDR-EVA There's some glass.

LMP-EVA Hey.

CDR-EVA You see if they're like Pele's - -

LMP-EVA Okay.

CDR-EVA - - eyeballs or whatever they are.

LMP-EVA I think we can get some over here. If you're - if you're careful coming over here, we can get glass that looks like it may have crystallized in place there.

CDR-EVA Okay. I'm talking about those little - little balls, too.

LMP-EVA Whoo, take it easy. Take it easy.

CDR-EVA *** you? Right there?

LMP-EVA Yes, but put your gnomon right over here, and we can get that for glass and that for subfloor.

CDR-EVA Okay. Let me - -

LMP-EVA But I'm not sure that is. *** breccia there. Everything is covered with dust here, and it's hard to tell the types. *** the rocks we're seeing are breccias. *** that glass is in your stereo.

06 21 35 43 LMP-EVA *** careful with it.

CDR-EVA Oh, shoot! *** any bags so - -

LMP-EVA Okay; the glass *** a glass agglutinate. Oh, no!

LMP-EVA *** that will survive going back now. It's a frothy - Glass agglutinate is going to be in bag 481.

LMP-EVA And - and it looks like a - almost like a cowpie - pile-type of bomb, *** if you'll pardon the expression. It's not flattened. It's - it's - it's - -

CC I will. I don't know whether anybody else - -

LMP-EVA - - it's an aggregate of glass in - or it's a pile of about four fragments, much like the one we're sampling.

CDR-EVA *** want to get a good scoop sample here. Maybe can we get some of those little fine pieces of glass around.

06 21 37 17 LMP-EVA And it looks like it's - It's in place from the day it was born.

CDR-EVA Oh, *** I'm having a hard time with this one.

LMP-EVA *** that rock right behind it.

CDR-EVA *** not going to be able to get that one in the bag, I don't think.

LMP-EVA Okay, Houston. My sample's in - 482 is a rock, but it doesn't look like subfloor. It looks like a blue-gray material we've been seeing, the breccia-type material. *** there's any difference.

CDR-EVA *** in!

LMP-EVA *** throw them in my bag.

CDR-EVA *** scoop out of here, though, Jack.

CC And, 17, why don't we get that scoop sample as the first sample of Jack's radial sample, 17?

CDR-EVA Okay. That's right. You're getting a radial sample. That's fine. I forgot you were doing that.

LMP-EVA Oh, man.

CDR-EVA That's all right, Jack. That won't come out. Just put it in there.

LMP-EVA Oh, boy.

CDR-EVA Okay. Let's let that one be the last - -

LMP-EVA Here's one.

CDR-EVA Well, okay. *** last ones that you can take. Got a lock?

LMP-EVA No. Stand by *** on that.

06 21 39 44 CDR-EVA *** before you go back *** down after a picture here. And I want to get a pan of this thing. *** stereo pan *** your radial sample.

LMP-EVA *** you take the after from there, and I'll go over here and - -

CDR-EVA Okay.

LMP-EVA *** wait a minute.

CDR-EVA You need the gnomon?

LMP-EVA No.

CDR-EVA Okay. I'm going to go over behind me and take part of the stereo.

LMP-EVA Where are you going to take your pan? Let me see.

CDR-EVA From - from behind me, where we were.

LMP-EVA Well, I think I'll just take my radial right from here to the Rover.

CDR-EVA That's great. That's great. *** that, and then you'll be right back at the Rover.

LMP-EVA And I'll take my pan from here, so you - -

CDR-EVA *** about four or five different modes of travel out here.

06 21 42 04 CDR-EVA I don't believe it.

LMP-EVA What?

CDR-EVA *** I'm out of film.

LMP-EVA *** film?

CDR-EVA 150. *** clicking. Jack, I - I - I didn't get the rest of that crater down there.

LMP-EVA Okay.

CDR-EVA *** got it 12 o'clock and around. Well, shucks.

LMP-EVA I can get it. Well, I'm going to be out of film, too, here before long.

CDR-EVA Okay. Just don't worry about it them. Just press on with your radials.

LMP-EVA I've got - I got a good pan over here. Did you get the crater at all?

CDR-EVA I got the right half of it and probably two-thirds of it, so we're going to - I'm just going to have to let that do. Okay. I'm going to see if I can get some 500s while you're doing that.

LMP-EVA *** isn't going to be an ideal *** sample, but it will have to do. Giddyapping over hill and dale (singing).

CDR-EVA *** you tell me what your primary desires are again on the 500, *** what we have?

CC Okay. The primary desire will be the North Massif, the blocks, and the trail. *** gravimeter off again, and we'll *** surface measurement here, as well, to check against the Rover.

CDR-EVA Okay. *** reading. *** I owe you one of those, don't I? 670, 037, 801; 670, 037, 801.

CC *** that.

CDR-EVA *** were going to do both of these things. I thought we were going to do one or the other. *** might as well do it right.

06 21 44 54 CDR-EVA MARK it. It's flashing.

LMP-EVA *** bag *** 52 Yankee is at the rim crest.

CDR-EVA Well, I'll tell you what I'm going to do. *** to steady the 500, and see what happens.

LMP-EVA Oh, I should have let you take this scoop back. Oh, no. Oh, me. Well, shoot! This isn't working out too well, Dr. Parker.

CC Say again there, Jack.

LMP-EVA This isn't working out too well. I've got to get rid of this scoop.

CDR-EVA Just set it there and take your sample. We'll get it.

06 21 47 43 LMP-EVA I'll take the samples going back. Just like in training; the scoop doesn't stay locked to the ***

CC Okay, 17. We'd like you to *** on. *** of the 500 millimeters. *** give you some information here on mags. *** we're going to take *** the tape recorder here, and we'd like to get that all done pronto.

CDR-EVA Okay; 85 is the mag count on the 500.

LMP-EVA I think that's a smart move, Bob. I don't think - -

CC Copy. 85 on the 500.

LMP-EVA - - I don't think the radial sample's going to tell you much here.

CC Okay. Let's take a - -

CDR-EVA Jack, you ought to get a scoop of that dirt, though.

LMP-EVA Well, there's one scoop - -

CDR-EVA We don't have a scoop of it, do we?

LMP-EVA Look what's underneath it.

CDR-EVA Well, I don't know what's underneath it.

LMP-EVA It's white.

CDR-EVA *** to make sure we got some of those small glass balls.

LMP-EVA *** a scoop of it. Upon the top.

CC 17, we're anxious for you guys to get going.

06 21 49 50 CDR-EVA Okay. Here's your gravimeter reading from the surface; 670, 057, 101; 670, 057, 101. *** to change my mag at the next station?

CC Copy that.

LMP-EVA Come here, Gene, quickly. We can't - We can't leave this. This may be the youngest mantle over - whatever was - -

CDR-EVA Take pictures of it. I don't have any film.

LMP-EVA - - was thrown out of the craters.

CDR-EVA Take pictures of it. *** got to take 5 more minutes. We'll be right with you. What Jack's done is he dug a - a trench in a - the southwest-northeast direction, and he discovered about

3 inches below - 4 inches below the surface - a very light-gray material.

LMP-EVA Possibility here - Careful, Geno.

CDR-EVA Yes. *** crust.

LMP-EVA Well, I'm trying - I'm trying to get the - the upper portion there. There we go.

06 21 51 02 LMP-EVA The first 2 centimeters, bag 483. The next 5 *** 484. Augh!

CDR-EVA Get some?

LMP-EVA I got quite a bit.

CDR-EVA That's enough.

LMP-EVA I got quite a bit. *** got to put that away, don't you?

CDR-EVA Yes.

LMP-EVA *** next 10 centimeters of the light-gray material and they're probably in 486 *** off. *** it is 486, right?

CDR-EVA 485!

LMP-EVA 485. Okay. *** say 483, 484? Okay.

CDR-EVA *** Bob?

LMP-EVA He's mad at us now.

06 21 52 27 LMP-EVA Okay. The third sample is in 485. Okay. Whoops, sorry. *** possibility here is that the - this upper 6 inches of gray material in here is the latest mantling in the area and the light-colored debris may be what's left over from the impact.

CC Okay; I copy. I understand. But we'd like to get you going.

CDR-EVA I know. We're going. Okay.

CC In case you didn't get the clue.

LMP-EVA What else? Magazines.

CDR-EVA *** change them at the next station. *** Bob?

LMP-EVA No, I've got to have some. I got to get some, or I can't take any pictures.

CC Okay, 17. We need Jack to put on magazine Nancy. And we'd like, Gene, for you to pull out the DSEA tape recorder at this station.

CDR-EVA Okay; I need a magazine too, Bob. I don't have any film at all.

CC Roger. That'll be Bravo if you change yours here. You could change it at station 10.

CDR-EVA I'll change it here. It's just as easy while we're in there.

LMP-EVA You want Bravo, huh?

CDR-EVA Bravo. And I'll get the tape - I'll get the DSEA. *** was outside there, I thought.

LMP-EVA *** hold it on - long enough for me to get this. *** all at one time. That's all right.

CDR-EVA I can't put that back in. I got - I got Bravo.

LMP-EVA Okay. I got that one.

CDR-EVA *** the dark slide out of Bravo, and it's in the dirt. I'm not going to pick it up. Okay. I'm changed. And I don't know what the mag count is, but let me get the DSEA. If this thing is true to form, I'm going to have to get *** tripped. *** what's *** got some rocks in that big bag. Okay. We're done with the SEP. DSEA is coming out. *** there's something on it.

06 21 55 43 CDR-EVA Oh, Jiminy Christmas! I can't even pick up that big bag to close the gate. I've got to - I've got to trip tht latch with - with tongs or something to lock it.

CC And *** Okay; we've had a change of heart here again, as usual. And we're going to drop station 10 now that we've heard you so much, and we're going to get a double core here. *** to get the - some football-size rocks while you're doing that. But double core here, and then we're going to leave here and go back to the LM.

LMP-EVA You don't want a - You don't want a - You don't want a double core here. I don't think we can do it, Bob. It's too rocky.

CDR-EVA *** we'll get through that stuff you just trenched?

LMP-EVA Well, I'm afraid there are rocks all through it, Gene. We can try, but - -

CDR-EVA Let's try it.

LMP-EVA Well, I don't like to try things that there is a probability of failure on - if you can - You're just going to lose some time. Okay; mag Nancy in on the LMP's camera. *** you can see the rock population here *** But we can try it.

CDR-EVA Sure. If we get a single, we get a single out of it.

LMP-EVA Oh, you're doing it, huh?

CDR-EVA I've got it started.

LMP-EVA Well, you're not even - Okay. *** going to debate the issue.

CDR-EVA No, it takes too much time debating it.

LMP-EVA Well, let's see how much time it takes. I hope you're right.

CDR-EVA Okay; and we need a - we need a lower out of my bag.

CC Okay. And - -

LMP-EVA Let me get the core.

06 21 57 42	CDR-EVA	A lower out of my bag is all we need.
	LMP-EVA	Watch it. You're in a crater almost.
	CDR-EVA	Yes. I want to get *** for you.
	CC	*** have you guys moving in 10 minutes. And we'd like to also deploy EP number 5 here.
	CDR-EVA	Okay. I'll start on - -
	LMP-EVA	Is it the lower 5? The lower, right?
	CDR-EVA	Yes.
	LMP-EVA	You got an upper?
	CDR-EVA	Yes. Why don't you get 5 out, and I'll start on the core.
	LMP-EVA	And I'll put it *** right there.
	CDR-EVA	Okay. The lower is 50; the upper is 37.
	CC	Copy. 50 and 37.
	CDR-EVA	You got 5, Jack?
	LMP-EVA	*** you put *** well *** gnomon away. Put it fairly near that trench. At least there is some documentation there. I'll try to have the pan going while you're doing it. Okay, Houston. *** to drive out of here?
	CDR-EVA	I'm driving out of here - -
	LMP-EVA	Left or right?
	CDR-EVA	I - I've got to go right. I got to go right.
06 21 59 18	LMP-EVA	Okay. Pin 1 is pulled and safe. Pin 2 is pulled *** Pin 3 is pulled and safe.
	CC	Okay, Jack. And we'll document it back to the Rover; I guess is the best way. That doesn't look too hard, Gene. Until just now.
	LMP-EVA	Looks like you proved me wrong.

CDR-EVA The first core was easy; the second one a little tougher; and then it got tough down at the end.

LMP-EVA There, I'm getting a picture of you. Okay?

CDR-EVA You got it from here? Okay.

LMP-EVA Yes.

CDR-EVA *** but it wants to slide out. It's full. No rocks in it. It looks like just the same stuff we've been traveling through.

CC *** Jack. I think you better help Gene with that - recovering that core there where the finger is going to fall out.

LMP-EVA You know, I think you're right. *** wait until I finish the pan, that's exactly what I'm going to do. *** capped.

CC I didn't know what you were doing. Okay.

06 22 01 13 CDR-EVA You hold - just hold the handle.

LMP-EVA *** take this one.

CDR-EVA *** very loose soil, Jack. And it's - just any little movement and you'll lose some of it.

CDR-EVA Let me cap that end. Don't move it.

LMP-EVA Oh-oh, you're - You almost knocked some out. Get your - You know where your thing is.

CDR-EVA Yes, but I need you - That - That cap's on you. The last one's gone off the Rover.

LMP-EVA That's all right. I'll stay here. Go put yours out there. *** move it.

CDR-EVA Any little movement and that stuff starts - -

LMP-EVA Yes.

CDR-EVA *** turn around. I'll get the rammer.

LMP-EVA Okay.

	CDR-EVA	Oh, man! Even these pins are getting stiff. *** Bob. The top rammed down - oh, almost halfway without any effort. Thank God.
	CC	Copy that.
06 22 03 12	CDR-EVA	*** bottom rammed down about an inch. Okay, Robert. See. *** I'll get this. What was the last thing - let's see - we had to do?
	LMP-EVA	A couple of football-size rocks.
	CDR-EVA	You got the DSEA?
	LMP-EVA	*** it. I got the charge. You got the double core. I got the double core. And I got one sample of a radial sample (laughter).
	CC	*** that's a unique one. And have we got the gravimeter back on the Rover?
	LMP-EVA	Yes; it's on. And we want to get a large block.
	CC	Okay. Copy that.
	CDR-EVA	No, let's get a couple of them. I've got - I've got one.
	CC	There's a plea here for a SESC from the shallow trench. We'd also like to have you moving in 4 minutes. That's with wheels rolling in 4 minutes.
	LMP-EVA	SESC, huh? I don't know if we can do that. We can try it.
	CDR-EVA	Bob, we cannot get an SESC in 4 minutes and roll at the same time.
06 22 04 29	CDR-EVA	*** got to push this latch on the - on the gate to get it locked - on the pallet to get it locked.
	LMP-EVA	Need some help?
	CDR-EVA	Push the pallet while I trip the latch, will you? *** trip the latch. There's so much dust in that core. No. No. Wait a minute. *** up. Wait a minute. Now - Now that's where - Now let me ***

LMP-EVA Yes. Yes.

CDR-EVA Should be locked now.

LMP-EVA That got it. *** got it.

CDR-EVA Okay.

LMP-EVA Got a big rock there, too? *** you know, the thing that amazes me is that there's no subfloor around here.

CDR-EVA *** one here.

06 22 05 45 CDR-EVA Okay. I'm about ready to clean up the Rover here.

CC Okay, 17. What's out there in the distance on a hillside in the field of view of the camera? The camera is pointing at it.

CDR-EVA *** there in the distance. Which hill? Let me see the - -

CC Oh, I'll bet that's the - that's the - that's the flag, I bet, on the charge.

CDR-EVA *** you're looking right at it, but it's only 10 meters away. You're looking right at the flag.

CC It's hanging in front of the hills. That's the problem. Okay. It's hanging in front of the hills. We thought we had an artifact or something like that. Okay. Press on.

LMP-EVA *** bag 486 is a light-colored rock taken about 3 meters to the right of the Rover. It should be - you should be able to pick it out in that last pan, unless the focus was bad.

CDR-EVA *** got all your TG readings?

CC *** got that. We'd like to have you climb on.

CDR-EVA You want the LCRU off?

CDR-EVA *** Jack, let's *** going.

	LMP-EVA	*** know, I don't think there is any subfloor in here. The rocks are so dust-covered that it's hard to be sure, but no rock I picked up looked like subfloor.
06 22 07 25	CDR-EVA	Get on there one time. *** three of them that time.
	LMP-EVA	(Laughter)
	CC	17, Houston. Do you read me through the - through the LM?
	LMP-EVA	You're loud and clear. I hope they came out.
	CDR-EVA	*** twisted this time *** off.
	LMP-EVA	Oh, let's see if old twinkletoes can do it.
	CDR-EVA	Jack, there's a big *** right there *** floor pan. *** I did last time.
	LMP-EVA	Okay. I'm on; strangely enough.
	CDR-EVA	Okay. Let's see. Okay. The charge is off to the ***
	LMP-EVA	*** clear it this way or - -
	CDR-EVA	Yes. I see it.
	LMP-EVA	Okay.
	CDR-EVA	*** they thought there was some more orange soil over there on the hills. *** this block field, we'll be able to *** little bit.
	LMP-EVA	*** stand on time.
06 22 09 23	CDR-EVA	Well, we've been out about 5 hours and 20 minutes or so.
	LMP-EVA	*** where are we headed, now that we are moving?
	CC	That's affirm - -
	CDR-EVA	Well, I'm trying to get around - trying to get out of the block field here, then I'll head back to the southwest. We going to Sherlock at all, Bob?

LMP-EVA That must be Gatsby over there.

CC No, we're going stright home. You can follow the steering home. And a reminder, Jack. We can get lots of photos. We've got lots of film left right now.

LMP-EVA Okay.

CC And, 17. Gene, I guess you're the one that took the SEP out. If you could give me - do you remember the reading of the SEP temperature when you broke it down?

CDR-EVA *** even look, Bob. It was 125 - 125 when we started the station.

CC *** that.

CDR-EVA That's Gatsby there, I guess, huh?

LMP-EVA Yes.

CDR-EVA It's not - it's not unlike Van Serg, though. Hey, you know that looks like mantling.

LMP-EVA *** can get a *** rock - there you go *** a shot looking back to the northwest - -

CDR-EVA Yes, I'll get that when I - -

LMP-EVA - - into Gatsby, because it looks like the mantle streams over the - the side from the southwest. Can you swing to your right - get up a little closer to the rim, there?

CDR-EVA *** a couple fragments in spots.

LMP-EVA Look at that. See that?

CDR-EVA Yes.

LMP-EVA See that structure. See how the - see how the mantle streams over - -

CDR-EVA Yes.

LMP-EVA - - from the northwest. Can you get that?

CDR-EVA Yes.

LMP-EVA And from the southwest. Yes. Go ahead. Keep going. *** it.

06 22 11 39 CDR-EVA *** 236/2.1.

LMP-EVA *** what I'm looking at is the - northwest *** Gatsby, where there's a very, very concentrated block *** on the inner wall, except where there are on the southwest three streams and on the northwest and north a continuous stream, if you will, on band, radial band, of mantle that is bur - appears to be burying that field, overlying and mantling the field. We got some pretty pictures of it, I think.

CC Copy that.

LMP-EVA *** I'm more and more convinced there's a mantle. One possibility, I guess, is that, if it's a pyroclastic mantle, that in the lunar vacuum environment and with whatever volatiles we're dealing with, the stuff becomes extremely fine upon vesiculation. *** been on it all the time and not known it *** recognizing it.

CDR-EVA As soon as we come through this draw, *** smooth or free of any debris or boulders it is on the other side of the upslope.

LMP-EVA Yes.

CDR-EVA Bob, do we have an extra EP?

CC *** have two of them behind you. We're going to deploy - We're going to deploy one. I'll give you a reading soon on that.

CDR-EVA Okay. Well, one - One I deploy at the end, I know. I thought we had an extra one here somewhere.

CC Okay. Yes, that's what I - Okay, that's the one we were planning on deploying all along, and it's there. We'll be deploying at a range of 0.1, which is just before you get to the SEP.

CDR-EVA Okay.

LMP-EVA *** Sherlock's going to be right over the top over here. *** when we were on that other ridge.

CDR-EVA *** there's a lot of bad landing places around here. *** Sun angle, I think, shows most of them up. Bob, I don't under - -

CC And, Geno, we were looking at the map here, and if you keep going straight to the LM, you're probably going to run into this crater area around San Luis Rey. You probably ought to head somewhat south of directly back to the LM, so we can at least tip the - western edge of Sherlock and then pick it up and go from there back to the SEP. It looks like it might be rather rough there in that dotted-lined area, if you can look at the back side of your map, Jack.

06 22 14 48 CDR-EVA Bob, I've already been doing it. I'm at 244/1.7. Already been doing that.

CC Copy that. Thank you.

LMP-EVA And, Bob, about - about 200 meters back, we crossed back into our standard mantle surface of about 1-percent fragment cover. It's the block field - -

CC Okay; 200 meters back from your present location. We copy that.

LMP-EVA *** see the LM.

CDR-EVA Yes, I can see the LM. And there's Sherlock, where those blocks are.

LMP-EVA Yes, that's the block field, the Sherlock block field; that's right. That is a block field.

CDR-EVA *** big ones there.

LMP-EVA Yes.

CDR-EVA *** station 10. *** even call it 10 Alfa in honor of the Apollo Program Office. The Apollo Spacecraft Program Office.

	CC	10 Bravo ***
	CDR-EVA	Oh, that's right. 10 Bravo. I knew I'd never get that straight. How fast do you think we're going, Jack, without looking?
	CC	Do those blocks look like gabbros, you guys?
	LMP-EVA	I think we're going about 18 clicks.
	CDR-EVA	*** just about right. *** first time we've been able to go downhill.
	LMP-EVA	(Laughter)
	CDR-EVA	Not really.
	LMP-EVA	*** close to this big block, if you can.
	CDR-EVA	Oh, yes.
	LMP-EVA	And I'll try to get a reading on what it is - some pictures of it as we come up to it.
	CDR-EVA	Yes. Boy that's a big one.
	LMP-EVA	*** looks like our old firend, the subfloor - -
	CDR-EVA	Subfloor, isn't it? Yes.
	LMP-EVA	Yes. Vesicular subfloor. Vesicles are about a centimeter maximum size. Didn't look like they were - They look like they're fairly evenly sorted. And the rock itself seemed to be massif.
06 22 17 06	CDR-EVA	250/1.4.
	CC	250/1.4.
	LMP-EVA	*** back into about a 5-percent rock cover as we cross the edge of the Sherlock block field.
	CDR-EVA	That's Sherlock over that rim over there.
	LMP-EVA	Yes. Yes. Once again, all these subfloor blocks look as if they're *** not mantle, necessarily, except maybe that one. Can you swing right, just a tad?

06 22 17 39 CDR-EVA That one's got the mantle blowing up on it, in it - in it's fractures and everything.

LMP-EVA Yes. That's the best example of that, I think.

CDR-EVA Take a picture of that?

LMP-EVA I got it. I got it.

CDR-EVA Watch it.

LMP-EVA Got it; got it. Everything in here so far is the tan-gray subfloor gabbro that I've seen. I haven't - Oh, there's one over there that's a blue-gray. But blue-gray is not abundant.

CC Okay. Copy that. And, 17, as you're getting closer, we're going to want an LRV sample at 1.1 on the range.

CDR-EVA Okay.

LMP-EVA *** now? 1.2?

CDR-EVA 1.2. Okay. We'll try to get block and soil.

LMP-EVA *** a fresh little pit.

CC That'd be good.

LMP-EVA Bob, I am continually impressed by the lack of exotic fragments in here.

CDR-EVA Hey, Jack. How about picking out a place over there?

LMP-EVA Okay. If you head into that little - Well, that's a crater there.

CDR-EVA Let me get around it. We can go a little bit further.

LM-EVA Yes. Maybe - -

CDR-EVA I'll go up on that flat area up there.

	LMP-EVA	Yes, yes. There are a lots of little fragments over there by that area - ha, ha. Okay. Now swing a shallow turn.
	CDR-EVA	*** get any of those?
	LMP-EVA	Unfortunately, I can't see them ***
	CDR-EVA	How about that one right in front of you, in front of the television camera shadow. See that little one up there?
	LMP-EVA	It's a little big, I think.
	CDR-EVA	Upper right, no upper right. Straight up the line.
	LMP-EVA	Oh, okay. Yes. If you can get over there, I can get it.
	CDR-EVA	I can get there.
	LMP-EVA	Oh, I guess I had the wrong - I guess I wasn't looking at the right one. The shadow is making it impossible to see down there. Now, see what you can get.
06 22 20 02	CDR-EVA	Bob, we're at 253/1.1.
	CC	Copy that.
	LMP-EVA	*** we do another sample, you're going to have to swing right so I can - see. I can't see this way.
	CDR-EVA	Yes.
06 22 20 26	LMP-EVA	*** 53 Yankee.
	CC	*** that soil or rock?
	LMP-EVA	That's soil. I can't see to get a rock. Go forward just a little bit, Gene.
	CDR-EVA	Okay.
	LMP-EVA	Bet you're going to get yourself in a box there.
	CDR-EVA	No, that's all right.

	LMP-EVA	Whoa. Oh, a little more. Sorry.
	LMP-EVA	*** will.
	CDR-EVA	*** see the LM anymore.
06 22 21 08	LMP-EVA	Okay. The rock fragments, that's 54 Yankee. Ahh! Okay. You got a rock right in front of you, don't you?
	CDR-EVA	I see it. *** over. *** Rover.
	LMP-EVA	LMP frame *** sample *** like about 60. 60! Have I taken 60 pictures?
	CDR-EVA	Boy, these rock fields are something else again.
	LMP-EVA	Yes, 60. Looks like some of our gray variety of subfloor up here *** rim of that little crater. *** think that maybe the gray relatively nonvesicular subfloor may be deeper - deeper fraction *** what we saw - well, actually, though, let's see - that could have been overturn, I don't know. Take that back. There just isn't much of it around here, although we saw a lot of it in the wall of Cochise.
	CC	Roger. We got that.
06 22 23 00	CDR-EVA	What do you think this is, San Luis Rey? We're at 252/0.9.
	LMP-EVA	I wouldn't doubt it at all. I'll *** San Luis Rey. *** east side of it - Mariner and San Luis Rey. They're shallow - filled with rocks.
	CC	*** we can tell, you're at one or the other of them.
06 22 23 34	CDR-EVA	*** tell you they're a lot - Okay. We're at 250/0.9. Mariner should look pretty fresh.
	LMP-EVA	*** certainly don't see much variety other than the gray and the tan subfloor variety. There's old Challenger.

	CDR-EVA	There she is. Pretty as a picture. *** tell you, there's no getting out of this stuff. You go from one to the other. I don't know whether I said it or not - -
06 22 24 27	CC	Gene, your range is 0.1. We're going to deploy the quarter-pound charge, and that'll be Jack's getting off to deploy it like we talked about last night.
	CDR-EVA	Okay. That's EP-2, Jack.
	LMP-EVA	EP-2; right. Bob, we're still - we're moving in and out of areas of say 1-percent to 5- to 10-percent blockiness. And where it gets blocky - not only is it more blocky, but we seem to have more of the *** craters in the range of 20- to 5-meter-diameter craters. That may be Mariner right there. How do you read, Bob?
	CC	Loud and clear.
	LMP-EVA	Hey, Van Serg, let me mention again, was an unusual experience in the plains geology here. *** be part of the San Luis Rey or Mariner, one.
	CDR-EVA	Yes. That's pretty deep. Pretty deep.
	LMP-EVA	*** is.
06 22 26 11	CDR-EVA	It's really big. *** at 252 and 0.6.
	LMP-EVA	The crater on our left - that is, south of us - is a large crater. It's somewhat deeper than craters of the same size that we've seen. And it, too, though, has - it's blocks - mainly - large blocks mainly in the walls, although there are blocks - blocks up here in the rim, *** up to 3 meters. *** blocks over there - that may be it.
	CDR-EVA	Yes.
	LMP-EVA	That's an edge of a crater, I guess.
	CDR-EVA	*** picture of that?
	LMP-EVA	*** that thing's fractured.

	CDR-EVA	*** the San Luis Rey, Luis complex, because see how elongated it is?
	LMP-EVA	Yes. Yes.
	CDR-EVA	Fact is, we're going to cut right through the western half here.
06 22 27 28	CDR-EVA	We're at 244/0.4.
	LMP-EVA	Bob, I may have said earl - early - early on up there at Van Serg that I saw subfloor, but we never did sample any that I know of. And the dust was thick enough that I'm just not sure. Breccias were the most obvious thing there.
	CC	Okay. Most interesting.
	LMP-EVA	It might have been a window in the plains here, of some kind. But - it's strange to see it there with so much subfloor all around it that we saw.
06 22 28 31	CC	And Jack, you're going to get a feedwater tone pretty soon.
	LMP-EVA	Got it. *** should be in AUX now.
06 22 28 49	CDR-EVA	252 and 0.2. There she is.
06 22 28 58	CC	And as soon as we get to the 0.1, let's stop and deploy the charge.
	LMP-EVA	Okay. And then I guess - Then I'll head back to the LM.
	CDR-EVA	Yes, I don't go to the - -
	LMP-EVA	*** to go to the ALSEP.
	CDR-EVA	(Laughter) I think I'm going to.
	LMP-EVA	*** go to the - Oh, you go to SEP. That's right.
	CDR-EVA	No, you're SEP when I ... - -
	CC	We're going to let you play the return to the ALSEP game there, Jack. We've got a few things for you to do out there, when the time comes.

	LMP-EVA	Okay.
	CDR-EVA	... We're almost to SEP. We're about 50 meters from SEP.
	CC	Roger. We'll be just short of the SEP.
	LMP-EVA	We can see if we can get to the end of the antenna - -
	CC	We'd like to have this - Well, no, no. Don't - let's have it east of the antenna. If we are there, let's deploy it right where you are.
	LMP-EVA	Okay. We're about 30 meters east of the antenna. How's that?
	CC	*** great.
06 22 30 09	LMP-EVA	Okay. And we're *** 221 and 0.2; 221 and 0.2.
	CDR-EVA	*** a rock. I stood up down there, and I want to get it - -
	CC	And it's EP number 2 that we're after, Jack, in case you've forgotten.
	LMP-EVA	Okay. Hey, our gate's open.
	CDR-EVA	It's open?
	LMP-EVA	Yes. But it looks like everything's here.
	CDR-EVA	How about the big bag?
	LMP-EVA	Big bag's there. They wouldn't dare run away.
	CC	*** or the pallet?
	LMP-EVA	The pallet. I'm sorry. *** ride all right that way.
	CDR-EVA	Boy, that dust. It's getting into everything. (Humming) Okay; I'm going to leave the gate like it is. Seems to be all right.
	LMP-EVA	Okay.

CDR-EVA Okay; EP-2.

LMP-EVA Where is that?

CDR-EVA Hey, Jack. You're just going to walk back from here, aren't you?

LMP-EVA I can, yes.

CDR-EVA *** don't you just go turn the SEP receiver off? *** did that. The receiver's all done.

LMP-EVA *** the transmitter - but you've got to come out here anyway.

CDR-EVA Yes, I've got to come out here. Forget it.

LMP-EVA I can do it.

CDR-EVA No, I was just reading ahead, but no sense. Forget it.

06 22 32 01 LMP-EVA *** I want you - Okay. Pin 1. *** and safe. Pin 2. Pulled and safe. *** 3 is pulled and safe.

CC Copied all those.

LMP-EVA And I'll try to put it in a depression. *** put it in a depression, if you want. Okay. *** I've got to take a pan, huh? Will a locater - Yes. How about a locater to the LM?

CDR-EVA You going to get on, Jack, or walk back? Dealer's choice.

LMP-EVA I'll get on.

CDR-EVA Okay. Locater to the LM. I'll give you a frame count, if I can read it: 90 - 92.

CC Copy; 92.

LMP-EVA *** to have to go left a little right here.

CDR-EVA *** left?

LMP-EVA To avoid the antenna.

CDR-EVA Oh - -

LMP-EVA Yes, we don't have to worry about it.

CDR-EVA - - we don't have to worry about it, but - but I will anyway. *** take it easy.

LMP-EVA Oh, that's all right. *** want to point out a rock to you I set up on end. *** get in the bag, and you can let me off there, and I'll carry it.

CDR-EVA Okay.

LMP-EVA But drive close enough so I can reach down and use the *** for support.

CDR-EVA Where is it?

LMP-EVA It's out over here. Between the - -

CDR-EVA On which side of that antenna?

LMP-EVA It's - -

CDR-EVA *** it is. Right there?

LMP-EVA No. No, it's out - it's on the - it's near the LM.

CDR-EVA Oh, okay.

LMP-EVA Here, I can go across this thing I already did.

CDR-EVA That bag is empty, isn't it?

06 22 34 11 LMP-EVA Yes, that's the one I lost, I mean, I dropped.

LMP-EVA Look's like you got over.

CDR-EVA Yes. Yes.

LMP-EVA I think it's that one there that's sort of dark.

CDR-EVA *** straight ahead?

LMP-EVA Yes.

CDR-EVA *** are by it. That must be it.

LMP-EVA That's it, yes. *** swing over so I can lean on the Rover when I put the - -

CDR-EVA Oh. (Laughter)

LMP-EVA That's good. No, that's good. That's perfect.

CDR-EVA *** off.

LMP-EVA *** now *** to get run ove/ this late in the game. *** what did I do that for?

CDR-EVA (Laughter) What did you do? Kick it under?

LMP-EVA Yes.

LMP-EVA *** oil changed?

CDR-EVA Yes. While you're under there, would you check (laughter) - check my transmission, please?

LMP-EVA (Laughter)

CDR-EVA (Laughter) And - any bubbles on the inside of the tires? Okay. Have you got it?

06 22 35 33 LMP-EVA Yes, I got it. Hey, Bob. I got my rock. It's halfway between the SEP and the LM. Wait, wait. Let me put it in the big bag - in the big bag.

CDR-EVA That bag is a monster now.

CC *** this that brown one you saw out here before, Jack?

LMP-EVA No, it's a gray one.

CDR-EVA Oops - Okay?

LMP-EVA Yes, I just lost the sample. *** my pocket, I guess. *** get some tongs.

CDR-EVA Okay.

LMP-EVA Then you can go ahead. I'll walk back.

06 22 37 45 CDR-EVA Okay, Bob. I'm back at the LM.

	CC	Roger. We have you back at the LM.
06 22 37 49	CDR-EVA	151, 12.0, and 001. Well, wait a minute. *** get your bag.
	LMP-EVA	I got it; I got it.
	CDR-EVA	Let me get your bag off.
06 22 38 17	CDR-EVA	*** reading 80 on the amps, 78 on the amps - *** that's amp-hours. Voltage is 62 and 65. Battery 1 is 132, *** 0. Motor temps are 200 and 210 on the rear; 200 and 250 on the fr - forward.
	CC	Okay. We copy that. Okay. And let's - Let me brief you here on the closeout tonight, 17. A number of things we were going to do here that are slightly different. We've got some stuff for you over at the ALSEP, Jack, and I'll get with you when you go over there. Nothing we have to worry about in the meanwhile. When we unload the Rover, we're going to take the SESC out, and we're going to use that to collect the contaminated sample out behind the footpad there as per plan, and when we take the traverse gravimeter off, we're going to want to get both a grav and a bias reading, because the pallet was swinging in the breeze there. Otherwise, let's press on with the closeout, and we'll get with you as times change.
06 22 40 09	CDR-EVA	Okay, Bob. The core tubes are going in SCB-7 - I mean - Yes, 7.
	CC	*** copy that.
	CDR-EVA	*** have TV, Bob.
	CC	Roger. We have TV. Thank you.
	CDR-EVA	*** my bag already?
	LMP-EVA	Yes.
	CDR-EVA	We'll have one more to put in here. I'm just going to lay this one over here. Yes, the big one. Man, there's some big ones in there, too.

LMP-EVA We can get some of that subfloor.

CDR-EVA Yes, there's one in my footpan too. You see it there?

LMP-EVA Yes, we'll have to - -

CDR-EVA Why don't you leave that there for a minute? Okay. What did you say about the TGE, Bob?

CC *** to take TGE, of course, as we planned. Take it off, and we'll try and get both a grav and a bias reading. You might initiate one of them now. We'll initiate another one later on. We've got plenty of time while it's sitting on the ground there to - to do our thing with it.

CDR-EVA *** where you are, Jack. I'll get this bag off.

CC You've got feedwater tone coming up pretty soon, Gene.

06 22 41 51 CDR-EVA Bob, I already got it, and I'm in AUTO. Just about 30 seconds ago. Okay. How are we fixed for samples? Here's 5, and it's about one-half to three-fourths full.

LMP-EVA Well, let's dump - -

CDR-EVA We've got to carry the SECS up.

LMP-EVA - - let's dump these - -

CDR-EVA *** 3.

LMP-EVA - - 3 in there, the Rover samples.

CDR-EVA Okay. *** ought to put the SESC in there, huh? If there's room for it. Where do you want the SESC, Bob?

CC Yes, let's put the SESC someplace - Let's put the SESC someplace where it's accessible to get that contamination sample. We probably want to get it before you go off to the ALSEP, but there's no real hurry on that. We'll see what works in best. I'm not sure where the most convenient place for you - -

CDR-EVA Yes. Why don't we get it now, and then we can - then we can have this bag - -

CC That's probably the - -

CDR-EVA Let's get it now. We can get the bag cleaned up. We can put it in bag 5.

CC Roger. There's probably not very many convenient places to put it. That sounds like a good idea to me.

LMP-EVA *** let me get my scoop.

CDR-EVA Get your scoop. Let's get it over with.

LMP-EVA Say again, Bob. You want that - I don't have a scoop; I don't even have a rake.

CDR-EVA They're both gone, huh?

LMP-EVA Yes.

CDR-EVA Use your - your Rover sampler.

LMP-EVA Yes. They both fell off when that thing opened.

CDR-EVA Yes. Here's a full core tube we can't forget.

LMP-EVA Yes, oh, that goes in the - -

CDR-EVA *** for it?

06 22 43 35 LMP-EVA Yes, why don't you get that scoop off, and I'll put it over here in 4. I mean in 7.

CDR-EVA *** time to lose it. I'm glad we didn't lose it (laughter) any earlier. If we were going to lose it, that couldn't have been more ideal.

LMP-EVA Yes. That was appropriate, I guess.

CDR-EVA *** two - we've got two empty core tubes. *** took a lot of them, though.

LMP-EVA We'll get it. We'll use them maybe.

	CDR-EVA	Back here.
	LMP-EVA	Let's get this thing in - -
	CC	Okay. We confirm that. Three ... core tubes is the only ones we're worried about bringing back.
	CDR-EVA	*** your thing.
06 22 44 18	CDR-EVA	We're going to get this SESC now and get it out of the way, Bob.
	CC	Roger. We agree with that.
	LMP-EVA	Minus-Z, huh? *** in front of the minus-Z footpad? Looks like a clean place.
	CC	Roger. Sort of underneath where you probably had the solar side of the cosmic ray experiment there. Between the SES - between the footpad and the ALSEP doors there.
	CDR-EVA	*** aobut an inch to go. *** fill it up.
06 22 45 42	CC	*** you - your feedwaters are up, 17, so things look good.
	CDR-EVA	Thank you. *** that white thing off for me?
	LMP-EVA	*** let me get *** got her.
	CDR-EVA	Okay. *** couple over here.
	LMP-EVA	Let me go past the radar. Good job.
06 22 46 41	LMP-EVA	Bob, radar's built better. I'm on frame 96, and the *** can sample - contamination sample is documented by two stereopairs *** before is the cosmic ray pictures.
	CC	*** SES - which SCB is that going in, Jack?
	LMP-EVA	Number 5.
	CC	Copy that.
	LMP-EVA	The SCB's in - the SCB's in 5. That what you have?

	CDR-EVA	Yes, short can in 5.
	LMP-EVA	The *** short (laughter) SCB. Okay. *** let me get - -
	CC	Okay. And while you're doing that, remember, I want inventories of the stuff as it comes off the Rover and where you put it over there by the footpad, so we can help you keep track of it.
06 22 47 45	LMP-EVA	Okay. I've got the - we've got the big bag, bag 7, bag 5, bag 4 at the footpad.
	CC	Copy that. We've also got SCB-3 with the Rover samples in it on the Rover, if there - if you have any - Yes, you have some of those today.
	LMP-EVA	No, we - we emp - emptied those into 5.
	CC	Okay. Copy that.
	CDR-EVA	Okay, Bob. The gravimeter's on the surface. And you want a gravity reading and a bias reading, is that correct?
	CC	We'll get a grav first.
	CDR-EVA	Okay, Bob.
06 22 48 32	CDR-EVA	MARK it. Let's see, where am I? *** do with the - -
	LMP-EVA	Okay.
	CDR-EVA	- - gravimeter? You've got another big rock over here from the - -
	LMP-EVA	It's in my footpan.
	CDR-EVA	That's from station 9, right?
	LMP-EVA	Yes.
	CDR-EVA	That's what I told them. Station 9, I got a football-size rock, and I've put it in there.

	LMP-EVA	*** eventually lost one clamp. *** got left on here. Okay. Gene's football-sized rock looks like it might be glass coated. *** might even have a shatter cone or two on it.
	CDR-EVA	Okay. I'll let you get - -
	LMP-EVA	I don't know what you're focused on, but here's his rock.
	CC	And, Jack, we're making plans here to change the camera usage at the end of EVA here. And we're going to let you take commander's camera out to the ALSEP and take a few photos that people think we need. And Gene's going to take your camera out and document the geophone when he deploys it. We will not deploy it for the long-term experiment, however. And we'll bring both back and carry them to the ETB when we get done.
	LMP-EVA	Okay.
	CDR-EVA	Okay. We've got to reverse the rolls of the camera here.
	LMP-EVA	While you're getting that, we've got to doff our harnesses. Let me - before you take this - -
	CDR-EVA	Are you going to start loading the ETB yet or not?
	LMP-EVA	Well, I'm just about there.
	CDR-EVA	Okay. I'll be right with you.
06 22 51 44	CDR-EVA	Okay, Bob. I've got the cosmic ray in the ETB.
	CC	Roger. Copy that. It's been in there all along, hasn't it?
	CDR-EVA	Yes.
06 22 52 00	LMP-EVA	Mag Foxtrot, or Franny, I guess we changed it to. Mag Donna. The DSEA. Mag Echo. Mag Linda. Mag Mary.

06 22 54 55	CDR-EVA	Through the 500?
	CC	Through the 500.
	CDR-EVA	Where's the cosmic ray? Did you put it in the ETB already?
	LMP-EVA	Yes.
	CDR-EVA	Okay.
	LMP-EVA	*** the 500's working anymore, anyway.
	CDR-EVA	It was working - -
	LMP-EVA	There it is.
	CDR-EVA	I used it.
	LMP-EVA	Yes. There it is. Film cycle. Three times. Wait a minute. Okay; here go the scissors.
	CDR-EVA	I'm going to go get a gravimeter reading.
	LMP-EVA	Oh, let's see now. There it is. Mag Karen is in.
	CC	*** sounds like all of them to us.
	LMP-EVA	There are two on the cameras.
06 22 55 07	CDR-EVA	I'm reading 670, 010, 701; 670, 010, 701.
	CC	Copy that. We're ready for a bias, Gene.
	CDR-EVA	Okay. Bias, and it is flashing.
	CC	Mark that.
	LMP-EVA	*** take a look around. Yes.
	CDR-EVA	*** that bag in there?
	LMP-EVA	Yes. It's over here on the MESA.
	CDR-EVA	Okay. Let's get rid of these tool harnesses. We don't need those anymore.

06 22 56 07	LMP-EVA	Your - you've come loose on the - you've come loose on the right. Wait, I'll pull it for you.
	CC	*** they come off, guys. Don't get them tangled up in the hoses.
	LMP-EVA	*** pull it off for you.
	CDR-EVA	We're at 500 - -
	CC	If you can't do it have Danny untangle - If you stand still, we'll have Danny untangle it.
	LMP-EVA	Turn this way. *** other side. It's off.
	CDR-EVA	Off, huh?
	LMP-EVA	Yes.
	CDR-EVA	You don't have to get it around those hoses and everything? *** do it. *** find the other one. Stand by.
06 22 56 42	LMP-EVA	*** only fallacy *** even watching this. *** watch me, Ed.
	CDR-EVA	Move over that way. He can't - -
	LMP-EVA	Can you see me?
	CC	See you.
	CDR-EVA	He's GO. Okay, Jack - -
	CC	That is almost easier than at the Cape.
	CDR-EVA	Hey, Bob, are we going to need those other core tubes?
	CC	We would like to have you leave the two core tubes, and the extension handle, and the hammer, and the - I suppose, the core cap dispenser here. If you get back in time from doing all our appointed tasks at the VIP site and at the ALSEP, we'll try and drive a double core here - -
	CDR-EVA	Don't leave it - don't leave it - -

	CC	- - to end things up with a bang.
	CDR-EVA	No, don't leave it there.
	LMP-EVA	Oh, that's right.
	CDR-EVA	Leave it here. We'll play games with the extension handle, but that's all right. Okay; let me set them over here. *** big bag. All those - the LRV sampler anymore.
06 22 58 20	CC	Gene, did you gwo guys lose your extension handle when the pallet came open?
	CDR-EVA	Yes, but we can - I can still drive a core with the hammer if we need to.
	CC	We copy that.
	CDR-EVA	One went with the rake, and one went with the scoop.
	LMP-EVA	Bob, as I read down the page, it looks like we got it. *** the ETB check, we had four mags in there, and the DSEA and the maps, and the cosmic ray. And I guess I'm ready to go to - -
	CC	Okay; you got six mags.
	CDR-EVA	Wait a minute; I want you to do something.
	LMP-EVA	Six mags is it? We want this.
	CC	The one - one further question. Did all the FSRs fet off the Rover into the big bag?
06 22 59 17	LMP-EVA	That's affirm.
	CDR-EVA	This is the one you need anyway; that's color. *** you can grab a couple. Right here.
	LMP-EVA	*** you dirty.
	CDR-EVA	I know it.
	LMP-EVA	*** I can get you.
	CDR-EVA	Yes, you can.

LMP-EVA Ed, you got your camera in the way.

CDR-EVA *** take them straight on. That's all right.

LMP-EVA That's sort of - Okay. (Laughter) Such - such a pose. Let me get a little different ***. That's good.

CDR-EVA Hey!

LMP-EVA *** more over here. *** pick.

CDR-EVA One - one more.

LMP-EVA How's like this?

CDR-EVA Okay. (Laughter) You got that camera. That's the color camera.

LMP-EVA Yes.

CDR-EVA You take it.

LMP-EVA I've got to go get a new neutron flux probe, I guess.

CDR-EVA Oh, yes. That's going to be easy to pull out. Okay; let's see if I got everything in here.

06 23 00 35 LMP-EVA You ready for me to go to the ALSEP? Houston, do you read? *** do you read me?

CDR-EVA Yes, I read you.

LMP-EVA Houston - Well, I don't know - -

CC Okay, 17. We had a slight changeover over there, and we've got you again.

LMP-EVA *** ready for me to go to the ALSEP?

CC *** ready for both of you guys now.

LMP-EVA *** mean? I'm headed for the ALSEP.

CDR-EVA Oh, let me see - -

	CC	Gene, are you ready for Jack to go to the ALSEP now?
	CDR-EVA	Yes, he's gone; he's good. *** ready to get on and go to the VIP site. Jack, wait a minute. Here, wait a minute. Where are you?
	LMP-EVA	Right over here.
	CDR-EVA	Come on back here a minute.
06 23 01 46	CC	We're trying to be subtle there, guys.
	CDR-EVA	Come on back here a minute. I didn't realize you were going out there quite so soon.
	LMP-EVA	Well, I just looked to see where it is.
	CDR-EVA	What did you do with that - -
	LMP-EVA	How about this one?
	CDR-EVA	You got it? *** what happened to that one in my footpans?
	LMP-EVA	*** big bag.
	CDR-EVA	Okay. ***, Jack. Here. All right?
	LMP-EVA	Yes. Let me - let me get it, so you don't get it too dirty.
	CDR-EVA	Very good.
	LMP-EVA	*** hold it.
	CDR-EVA	Okay.
	LMP-EVA	Yes. *** here?
	CDR-EVA	*** right over here against that back - background.
06 23 02 51	CDR-EVA	And before we close out our EVA, we understand that there are young people in Houston today who have been effectively touring our country, young people from countries all over the world, respectively, touring our country. They had the opportunity to watch the launch of Apollo 17, hopefully

had an opportunity to meet some of our young people in our country. We'd like to say, first of all, welcome, and we hope you enjoyed your stay. Second of all, I think one of the most significant things we can think about when we think of Apollo is that it's opened for us - for us being the world - a challenge of the future. The door is now cracked, but the promise of that future lies in the young people, not just in America, but the young people all over the world learning to live and learning to work together. In order to remind all the peoples of the world in so many countries throughout the world that this is what we are all striving for in the future, Jack has picked up a significant rock, typical of what we have here in the valley of Taurus-Littrow. The rock is composed of many fragments of many sizes, many shapes, probably from all parts of the Moon, perhaps billions of years old. A rock of all frag - sizes and shapes, fragments of all sizes and shapes, and even colors that have grown together to become a cohesive rock, outlasting the nature of space, sort of living together in a very coherent, peaceful manner. When we return this rock and some of the others like it to Houston, we'd like to share a piece of this rock with many of the countries throughout the world. We hope that this will be a symbol of what our feelings are, what the feelings of the Apollo Program are, and a symbol of mankind that we can live in peace and harmony in the future.

06 23 05 43 LMP-EVA A portion of a - of a rock will be sent to a representative agency or museum in each of the countries represented by the young people in Houston today. We hope that they will - that rock and the students themselves will carry with them our good wishes, not only for the new year coming up but also for themselves, their countries and all mankind in the future. Put that in the big bag, Geno.

CDR-EVA In the big bag. *** salute you, promise of the future.

06 23 06 23 CC Roger; Jack and Gene. We thank you for your sentiments and your interest.

CDR-EVA Now let me bring this camera around. To commemorate Apollo 17's visit to the valley of Taurus-Littrow but as an everlasting commemoration of what the real meaning of Apollo is to the world, we'd like to uncover a plaque that's been on the leg of our spacecraft that we have climbed down many times over the last 3 days. And I'll read what that plaque says to you. First of all, it has a picture of the world. Two pictures, one of the North America and one of South America. The other covers the other half of the world including Africa, Asia, Europe, Australia, the North Pole, and the South Pole. In between these two hemispheres, we have a pictorial view of the Moon, a pictorial view of where all the Apollo landings have been made so that when this plaque is seen again by others who come, they will know where it all started. The words are, "Here man completed his first exploration of the Moon, December 1972 A.D. May the spirit of peace in which we came be reflected in the lives of all mankind." It's signed, "Eugene A. Cernan, Ronald E. Evans, Harrison H. Schmitt, and most prominently, Richard M. Nixon, President of the United States of America." This is our commemoration that will be here until someone like us, until some of you who are out there, who are the promise of the future, come back to read it again and to further the exploration and the meaning of Apollo.

06 23 08 59 CC We in Houston copy that and echo your sentiments, and Dr. Fletcher is here beside me. He'd like to say a word to the two of you.

MCC Gene and Jack, *** been in close touch with the White House, and the President has been following very closely your ***. He'd like to wish you Godspeed as you return to Earth, and I'd like to personally second that. Congratulations. We'll see you in a few days. Over.

CDR-EVA *** you, Dr. Fletcher. We appreciate your comments, and we certainly appreciate those of the President. And whether it be civilian or military, I think Jack and I would *** like to *** salute to America.

06 23 09 54 LMP-EVA Dr. Fletcher, if I ***, I'd like to remind everybody, I'm sure, of something they're aware, but this valley, this valley of history, has seen

mankind complete its first evolutionary steps into the universe, *** the planet Earth and going forward into the universe. *** think no more significant contribution has Apollo made to history. It's not often that you can foretell history, but I think we can in this case. *** think everybody ought to feel very proud of that fact. *** very much.

CDR-EVA Okay, babe. Let's go to the - -

MCC I'll see you in a little bit.

CDR-EVA Okay, Bob. I owe you a - a bias reading.

CC You can get it later. There's no hurry on that.

CDR-EVA I'm going to give it to you right now.

CC And we're off to the ALSEP. Okay. Ready to copy. I presume you've a UHT out at the ALSEP, Jack?

LMP-EVA That's affirm.

06 23 11 11 CDR-EVA 337, 417, 101; 337, 417, 101. Are you through with this?

CC Roger. (Laughter)

LMP-EVA Be kind. Be kind.

CC Roger. We're through with it.

CDR-EVA Well, I love it, and I'm sure it did a good job.

CC Well, we're not through with you, Gene, so don't throw yourself too far.

CDR-EVA No, sir. I just don't want to hit old Challenger there.

LMP-EVA That was unkind. *** javelin. That was unkind.

CDR-EVA I didn't throw it as far as I could - -

CC Roger, Gene. And we - we time the parabola for that, and we have one excellent measurement of g on the Moon now.

CDR-EVA *** I didn't get you a - I didn't get you a pendulum, but I don't know where I would, Bob. Okay. I'm going to have to take you out to the VIP site, if you concur?

CC Okay. We're ready for that, and we'll - -

CDR-EVA Well, let me make sure I got everything. Okay.

LMP-EVA We're taking both cameras up, Gene.

06 23 12 40 CDR-EVA I'll bring it back. Okay. Bob, I guess you're reading me through the LM, huh?

CC *** through the LM. You guys both read me through the LM?

LMP-EVA That's affirm.

CDR-EVA Okay. The first thing I want to do - Tell John I'm going to do it exactly like he wants. Okay. *** camera is under the seat, I hope. Let me look. Yes, the camera's there. Jack, did you do something with the dustbrush?

LMP-EVA No.

CDR-EVA It was under the seat, right?

LMP-EVA It was, yes.

CDR-EVA Yes, I want to make sure it is, because I'll need it out there.

LMP-EVA No, wait a minute. I don't know that it's there now.

CDR-EVA Well, I want to make sure that I can get - get something to dust with.

CC Okay. And, Jack, as you go out to the ALSEP, let me cue in on your next 3 hors worth of work out there repairing the ALSEP. All right? Over.

LMP-EVA Okay. Go ahead. I'm here.

06 23 14 16	CC	Okay. Number one, we want to retrieve the UHT. And I quote, "tap sharply" - *** "sharply" on the gimbal, which is the center section there, the little square metal piece in the middle - tap sharply on the gimbal with the UHT, and then reverify the level on the LSG. We'll check response here in Mission Control after you've done that.
	LMP-EVA	You mean tap on the thing that swings? *** always wanted to do that, didn't you?
	CC	That's what they say. Yes, that's right.
	LMP-EVA	Well, *** see if I can grab a clean UHT to do that.
	CDR-EVA	Okay, Bob. Everything is zeroed.
	CC	And I'll be talking to Jack here, Gene, for a while. You can interrupt with your comments over - talking over me, and I'll try and copy them.
06 23 15 22	CDR-EVA	One comment. I got a flag on the other battery, 139 degrees.
	CC	Okay. We copy that.
	LMP-EVA	How much is sharply?
	CC	Sharply is sharply. It's probably not heavily, but sharply.
	LMP-EVA	On the edge?
	CC	Fairly light, but a sharp tap.
	LMP-EVA	On the edge?
	CC	No. You see that little square metal piece in the middle there?
	LMP-EVA	Oh, yes.
	CC	That little square metal piece on there. You can just sort of rap on that.

	LMP-EVA	Okay. Here goes. *** did it. *** do it again? Okay. And then it says - -
	LMP-EVA	*** sort of a med - moderate hard tap. *** level.
	CC	Hit it harder. Hit it harder, please.
	LMP-EVA	Okay. Okay? *** hit it harder yet.
	CC	We've observed something there. Stand by.
	CDR-EVA	You might be getting TV the way the antenna's oriented right now.
	CC	Okay. Jack, go ahead. We'll do some more stuff here. In the meanwhile, while they're thinking about what's wrong with it, did you just tap it again?
06 23 16 54	LMP-EVA	I didn't touch it. I'm over at the central station now.
	CC	*** looking at it. All right. Now, we want to take some photographs at the central station and a few selected - a few selected photographs of the ALSEP. Number one, we want a 7-foot cross-Sun to the south of the ALSEP central station and then a 7-foot down-Sun of the cent - central station. Over.
	LMP-EVA	A 7-foot cross-Sun to the south.
	CC	*** says.
	LMP-EVA	Then a down-Sun.
	CC	*** 7-foot down-Sun.
	LMP-EVA	*** tell me what they're trying to get with it. I might be able to help them.
	CC	Okay. I presume that what this means is looking to the south. It was cross-Sun originally. I suspect that's what happened here, the way it was written up. *** 7-foot looking at the - all the switches to make sure you guys turned them the right way, I suppose. And then a 7-foot looking down-Sun, so that would be facing west, that side of it.

LMP-EVA Okay. I got it.

06 23 18 07 CC Okay. Now, there's a problem with the central station - which they think the south end is buried more deeply in the dirt than they had intended. And the central station is at present time getting very warm on the back side on the south side there, which is - they believe you probably buried in the ground when you were trying to tilt it to the proper alignment. They are requesting that when you're at the ALSEP you remove any soil buildup or debris with a convenient tool. They don't want you to touch it because it's fairly warm. *** have a UHT or something to move it - *** have a UHT with you or something with you that you can brush that soil aside with?

LMP-EVA Yes, sir. It is piled up there. That's - -

CC Okay. You know the section I'm - Yes. Okay. They'd like that brushed away.

LMP-EVA Fortunately, I brought my handy-dandy Rover sampler out.

CC Okay. You can brush that aside, and give me a call when you think that's cleared up the way it ought to be. *** probably one of those things we didn't think about when we decided to tilt the central station.

LMP-EVA Well, you didn't - you couldn't anticipate the soil, Bob. It's very soft.

06 23 19 22 CDR-EVA Bob, we are at VIP.

CC And Ed Fendell is hard on my back to remind you that it's better to be too far away than too close.

CDR-EVA *** right. *** I was, but I think I may move just a little bit. There's a little rise here I can give you. *** I'll give it to you.

LMP-EVA *** way, Bob, the soil gets more cohesive with depth. *** really noticed that before.

CC Okay. We copy that. What do you notice?

	LMP-EVA	It's - it's quite a bit more cohesive at - about the - feels about the same down to 3 centimeters out here, and then the cohesiveness goes up, so it's difficult to scrape with the Rover sampler.
	CDR-EVA	Well, I think you can see almost everything from here.
	CC	Okay, Geno. And, Jack, let me know when you get done scraping that soil away.
	LMP-EVA	*** will. And now comes the hardest alignment of them all, but I'll get it. *** about there. *** can't tweak it up for you. Bob, the east-west level bubble is not quite level. *** north-south is. *** me to tweak that up?
	CC	*** tweak that up. We are getting a good signal, but go ahead and tweak it up just a little bit. *** what are you doing these days?
06 23 22 11	CDR-EVA	I'm getting the high gain set up for you.
	CC	Now you know why we didn't make you park it in that orientation all the time, don't you?
	CDR-EVA	Boy, I'll tell you, it was a piece of cake up until now. I got you. *** right down the center of my eyepiece. You should have TV.
	CC	I don't think - Yes, we're getting TV there, Geno.
	CDR-EVA	You getting it? Well, let me *** look, and clean things up.
	CC	We've got TV. Okay. I guess you can dust and dust and dust some more for a while.
	CDR-EVA	*** dusting problem out of the way before I do anything else. *** look at your vantage point, and if you don't like it, let me know.
	CC	Okay. I'll call Captain Video.
	LMP-EVA	*** close can soil be to this backplate of the ALSEP?

	CC	*** check.
06 23 23 54	LMP-EVA	*** about *** centimeters away, most of the places now.
	CC	*** good. We'd like you to return to the surface gravimeter, Jack. What you did had some effect, but not - not a lasting effect. And we'd like you to rap even more sharply, *** strongly on the gimbal another three times. And we're again watching it, and we'll let you know what to do. *** might tell you that this has all been done recently this afternoon up at Bendix on the qual unit, and it survived it, so we aren't in any real danger, apparently, of destroying it.
	LMP-EVA	Okay. Three times, huh?
	CC	*** three times.
	CDR-EVA	Don't let me forget to bring a dustbrush back when I come. I know it's in my checklist.
	CC	I'll mark that down to remind you. And, Jack, you'll be glad to know that the temperature of the backplate there has already dropped 20 degrees - 20 degrees.
06 23 25 55	LMP-EVA	Beautiful. I don't think that bubble is working. *** your signal now?
	CC	Stand by. I'll check. But why don't you go to the - to the surface gravimeter?
	CDR-EVA	*** how's your TV lens? I don't have a lens brush. It looks good from here. I don't want to use this unless you think so.
	LMP-EVA	*** three times. Satisfied?
06 23 26 20	CC	Get out of the way please, Jack, and we'll take a look against some bright soil.
	CDR-EVA	No, that's me he's talking to. I have one of the lens brushes - -
	CC	It looks pretty good, Geno. Go ahead. Yes, go ahead. It looks pretty good to us.

	CDR-EVA	Okay.
	LMP-EVA	Okay, Bob. Here come the raps. *** three times.
	CC	*** Jack. That's really fighting it pretty hard. We'd like you to put the UHT in the socket and rock it very firmly. Don't pick it up, but rock it very firmly from side to side in all four directions about - Move your UHT about 6 inches in each direction while you're doing it.
06 23 27 34	LMP-EVA	Okay. Okay; I rocked it. *** swinging. And the level bubble is - -
	CC	Okay. We understand it's in good configuration again as far as alignment and leveling is concerned, Jack. Let's go on and take some more ALSEP photos, and let them think about it for a minute.
	LMP-EVA	Okay. What do you want?
	CC	Next, what wy want is some heat flow. Okay. We just got late word. They'd like to do it one more time, and then call it quits. It seems - -
	LMP-EVA	*** rocking bit, huh?
	CC	The walk - rocking bit one more time.
	CDR-EVA	I may have moved the high gain. Do you see any change in signal? If you're happy, I won't touch it.
	LMP-EVA	Okay, Bob. *** rocked. The shadow - the shade is aligned to the Sun now, and it's level.
06 23 29 49	CC	*** copy that, and let's go get some ALSEP photos, Jack. I think you got some heat flow photos the other night, besides the two pans. If you did, we may - these may be redundant. They're - they want the cross-Sun and down-Sun of the east hole and cross-Sun and down-Sun of the west hole. And I'm not sure but what you got those earlier. You said you got some extra heat flow, but tell me if you did. They're both - all four of these are 7-foot - -

LMP-EVA *** heat flow pictures. They - *** 11-foot, I think. And the the stereopair at 7.

CC I think all they're asking for is the two 7-foot stereopairs.

06 23 30 40 LMP-EVA Okay. That's one of them.

CC *** they're asking for, Jack, is a 7-foot down-Sun and a 7-foot cross-Sun, which isn't quite what we've been taking in the past.

LMP-EVA I'm getting the standard ones, Bob. You got the standard documentation. *** footers and a 7-foot stereos.

CC Okay. Okay. Go ahead. They can't complain about that, certainly.

LMP-EVA Okay. Now what?

CC We'd like a 3-foot shot of the lunar mass spectrometer including the orifice where the breccia was.

LMP-EVA Cross-Sun?

CC And, Geno, we are observing some degradation and would like to have the high gain. Yes, Jack; 3-foot cross-Sun. Gene, this is Houston. We'd like to get the high gain reoriented a little bit. We're observing some degradation in the picture.

CDR-EVA I'll tweak it.

06 23 32 01 LMP-EVA Okay. Now what? ***S is complete.

CC *** that. Now we want to go over the neutron flux, Jack.

LMP-EVA *** the gravimeter doing?

CC *** looking at it, Jack. I'm not sure.

CDR-EVA Hey, Bob. *** you want covered? That's the panel. Okay. You want the - the panel with the - with the ON-OFF switch and the - and the signal strength switch and so forth covered, don't you?

	CC	And be sure to get the thing to EXTERNAL before you cover it there, Gene.
06 23 33 51	CDR-EVA	Okay. That was going to be a question of mine. It's EXTERNAL.
	CC	That goes to EXTERNAL.
	LMP-EVA	What - what do you want me to do with the neutron flux?
	CC	We want a photograph facing south for the 7-foot. So a 7-foot cross-Sun, essentially, of the neutron flux in the soil.
	LMP-EVA	Okay. *** like to have the RTG in that picture?
	CC	I suppose if you're generous, you might take a partial pan around to the RTG.
	LMP-EVA	*** about that direction. Okay. Now what?
	CC	Now let's remove - remove the neutron pro - probe experiment from the ground and turn it off.
	LMP-EVA	Okay. *** on the gravimeter, huh?
	CDR-EVA	Bob, - -
	CC	No, the gravimeter is looking very bad still.
	LMP-EVA	That's too bad.
	CDR-EVA	It really is.
	CC	Jack, you might note as you withdraw just how difficult it is to withdraw it. It - it - whether or not it's been seized by the soil collapsing around it or not. That's a soil mechanics goody.
	LMP-EVA	Not at all, not at all.
	CDR-EVA	It won't be, I'll tell you.
	LMP-EVA	No problem.
	CDR-EVA	Okay. The high gain is - -

	CC	Okay. We copy that.
	CDR-EVA	- - The high gain is tweaked.
	CC	We'll consider ourselves tweaked.
	CDR-EVA	I'm giving the LCRU another zap here. Boy, I tell you, I ain't going to do much more dusting after I leave here.
	LMP-EVA	Okay. Upper probe is OFF -
06 23 36 02	LMP-EVA	MARK it.
	CDR-EVA	Okay, Bob. I'm going to put bus B and D, OPEN, and AUX circuit breaker, BYPASS, ON.
	CC	Okay. Copy that.
	CDR-EVA	And let me see. BRAVO. Okay. And Delta. Okay. Bravo and Delta.
	LMP-EVA	*** probe is OFF -
06 23 36 35	LMP-EVA	MARK it.
	CC	*** or lower, Jack?
	LMP-EVA	Lower. I'm sorry, Bob.
	CC	Copy that.
06 23 36 52	CDR-EVA	AUX POWER circuit breaker is ON. BYPASS, ON.
	LMP-EVA	And the lower probe is capped.
	CC	Okay; and, Gene, you need to close that CAUTION AND WARNING FLAG. It's a heat sink when it's open, I guess.
	CDR-EVA	Okay; it's closed. *** me to put a bag in front of that thing? *** me to put a bag in front of it in case it pops open again? I guess it won't.
	CC	No, I don't think so. I can't imagine why it's really a problem anyway, because we got the BYPASS, ON, there, and that heat's not going anywhere.

CDR-EVA Okay; now the switch is off, except my 15 volts.

LMP-EVA You want me away from the ALSEP now?

CC Stand by, Jack. I'll get one more word before we come back to the LM.

LMP-EVA Okay.

CDR-EVA I got a camera *** there. I'm going to look under the seats one more time. *** but a 500 - Okay. *** tape.

CC Jack, we're ready to leave the ALSEP.

LMP-EVA Well, I hate to do that, Bob. I'm sorry about this gravimeter, though.

CC You're not the only one. Down here there's a whole room full of people who are sorry.

CDR-EVA *** the LMP's camera. Nothing in here but couple of old bags. We used about all the bags we had, Jack. Not many here. I have the dustbrush tethered.

CC *** brush.

06 23 39 50 CDR-EVA Okay; let me get one parting shot of - one of the finest running little machines I've ever had the pleasure to drive.

CC And, Geno, some people down here are concerned about whether you've opened the battery covers or not.

CDR-EVA Yes, sir; they're open. Oh, what a nice little machine. *** little downslope, but at the heading you want, and I guess Ed's satisfied with the TV response, huh?

CC We're satisfied with the TV, Gene. We're ready for you to take the EP number 3.

CDR-EVA *** Mother Earth is right smack in the center. While we've got a quiet moment here, as I go to de - deploy that EP charge, I'd just like to ***

part of Apollo 17, or any part of Apollo, that has been a success thus far is probably, for the most part, due to the thousands of people in the aerospace industry who have given a great deal, besides dedication and besides effort and besides professionalism, to make it all a reality. And I would just like to thank them, because what we've done here and what has been done in the past - As a matter of fact, what has been done for 200 years, you've got to contribute to the spirit of a group of people who form the aserospace industry. And I God bless you and thank you.

CC And we thank you guys.

06 23 43 12 CDR-EVA We're just two little - two little sets of twinkle-toes here. There's a lot that goes to getting this Rover running out here *** don't have much to do with. And I guess there might be someone else that has something to do with it, too, and I've been reading His signs, maybe not from Him directly, but His in spirit, as we run up and down that ladder. And that's Godspeed the crew of Apollo 17. And if He's listening, I'd like to thank Him, too. Pin 1 is pulled. *** the end of the west SEP antenna. Do you agree with that?

CC Exactly right.

06 23 44 40 CDR-EVA Okay. Pin 2 is pulled. Still safe. Pin 3 is pulled, and it's still safe. Don't know what I would do if it wasn't.

CC *** that. And - and now, also, do you have the SEP transmitter turned off there, Gene?

CDR-EVA No, sir. Thank you. Okay. Bob, it's getting right - -

CC We're ready for you guys to get back to the LM and dust it.

CDR-EVA - - It's getting right adjacent to the ring on the west end, and I'm going to go back and turn the SEP off.

	CC	And when that's done, Gene, we're ready for you and your dustbrush to hasten back to the LM and dust each other and climb in.
	CDR-EVA	You know what, Bob? Great as an experience as it has been - -
	CC	What, Gene?
	CDR-EVA	- - I'd say we're probably both ready.
	LMP-EVA	Oh, I don't know. Hey, Bob, 55 Yankee is an exotic-looking rock I found about 5 meters south of the neutron flux hole. *** gray - possibly gray basalt. It's just that there aren't many of them around here, and so I picked it up. *** a little again.
	CDR-EVA	You'll always be picking rocks.
	LMP-EVA	Oh, I don't know.
06 23 46 03	CDR-EVA	Okay; the transmitter is OFF. I don't blame you.
	CC	*** that.
	CDR-EVA	There's so many interesting thing around here.
	LMP-EVA	Don't lose your brush, Gene.
	CDR-EVA	Okay, Bob, according to my inventory I'm going to return to the LM, and the camera is going to ETB. We are done with the TGE.
	CC	That's affirm. We'll have - Roger.
	CDR-EVA	Yes, come to think of it - -
	CC	We need a bias reading if you want to use it again, Gene.
	CDR-EVA	Come to think of it, I guess you are, aren't you. *** you, Jack?
	LMP-EVA	I'm at the MESA. *** snap a snap.

CDR-EVA I need a locater here on the LM.

CC And, 17, we need you guys in the LM in 15 minutes, 15 minutes because of oxygen constraints.

CDR-EVA Okay, Bob. My pictures are taken; *** the way. Oh, boy, where else can you *** landed 30 meters back, Jack, we'd be pitched down 5 degrees. Okay; what they're saying is, I don't need my hammer any more. All we do is dust and get in.

CC Roger. We want you to dust and get in. We got 14 minutes remaining before we need the hatch closed.

CDR-EVA Okay, Bob. We'll - we're doing our best. *** RTV worked on the hammer, but look at it, Jack. *** worn completely to a nub. It's off.

LMP-EVA I guess that's all right - Look at - Here - my - I *** know where I am. Oh, boy. *** that? Okay.

CDR-EVA Okay, sir. You ready to go on up?

LMP-EVA Well, I don't know. Got to take my camera off. *** another batch of pictures *** the flag - -

06 23 49 54 CDR-EVA Well, watch this real quick.

LMP-EVA Stereo, even.

CDR-EVA Jack - -

LMP-EVA Let me have your camera. Over there; throw it over there. Let me throw the hammer.

CDR-EVA Okay.

LMP-EVA Let me throw the hammer.

CDR-EVA It's all yours.

LMP-EVA You got the gravimeter - -

CDR-EVA You deserved it. A hammer thrower - You're a geologist. You ought to be able to throw it.

LMP-EVA You ready?

	CDR-EVA	Go ahead.
06 23 50 14	LMP-EVA	You ready for this? Ready for this?
	CDR-EVA	Yes. *** hit the LM *** ALSEP.
	LMP-EVA	Look at that! Look at that! Look at that! Beautiful.
	CDR-EVA	*** was going a million miles, but it really didn't.
	CDR-EVA	Here, this is an ETB.
	LMP-EVA	Let me - let me make sure that that's all cinched up.
	CDR-EVA	Okay. *** start on up. *** get going here.
	LMP-EVA	Yes. Unfortunately, their little plan didn't count for the fact that it's hard to pack the ETB with the film magazines in it.
	CDR-EVA	And I'll try and get the big bag here cinched up.
	LMP-EVA	That is a major task.
	CDR-EVA	Yes, that's going to be - Oh, is it heavy. *** heavy. Something in that core tube you put in there?
	LMP-EVA	Yes, sir.
	CDR-EVA	Okay.
	LMP-EVA	Don't tell anybody, though, because they'll get mad at me.
	CDR-EVA	Oh, man, is that heavy! Holy smoley!
	LMP-EVA	If you won't tell anybody *** - 252. *** about three-quarters of a core - *** pushed - half a meter inside the plus-Y footpad.
	CC	Copy that.
06 23 51 33	CDR-EVA	Okay, Jack. How's that ETB coming so you can get going?

LMP-EVA Fine.

CDR-EVA Okay; I've got to - -

LMP-EVA I've got to put it on a strap, though.

CDR-EVA *** get that. You can - This is all cinched up. *** it'll hold. *** start on up? Then I'll start dusting you.

LMP-EVA Okay.

CDR-EVA *** good.

LMP-EVA *** fall out.

CDR-EVA No.

LMP-EVA Okay. Oh - -

CDR-EVA Let me dust you. Set that down, and I'll hand it all to you.

LMP-EVA Okay; you'll have to hand stuff to me then.

CC Okay; and, 17, we - a reminder, we need you inside in 10 minutes.

CDR-EVA Okay, Bob.

LMP-EVA *** do a lot of jumping up here in a minute.

CDR-EVA Your back is clean.

LMP-EVA *** the legs as best I can.

06 23 52 33 CDR-EVA Okay. Why don't you get me here before you do that?

LMP-EVA Okay. And while I'm doing that, will you *** it. *** you got dirty today. *** we're just going to have to live with it.

CDR-EVA *** top. I can kick a lot of that stuff off my legs. *** look in back.

LMP-EVA Terrible. Okay; turn.

LMP-EVA *** legs are really filthy. *** can do about it.

CDR-EVA Okay; I'll get them off. Why don't you start back - -

LMP-EVA Just kick them against each other and - -

CDR-EVA Okay. Start on up.

LMP-EVA You might shake the bags.

CDR-EVA Okay.

CC *** forget your PLSS ***

LMP-EVA PLSS antennas. *** doesn't make much difference anymore. *** get them out of the way.

CDR-EVA The big bag didn't stay closed very long.

LMP-EVA *** how we can get that in.

CDR-EVA There, I'll stand - I can hand it to you.

LMP-EVA *** had a very good closure on it - -

CDR-EVA *** won't hold.

LMP-EVA - - but it can be closed.

CDR-EVA I had it over - over the top. The latch was closed, but - -

06 23 54 38 LMP-EVA It won't hold with all that weight in there. Okay; I got your antenna.

CDR-EVA Okay; *** a high. *** to close this. You don't want that in your way.

LMP-EVA I can't close it.

CDR-EVA Oh, okay.

LMP-EVA *** try.

CDR-EVA *** your flaps? Hold your head down.

LMP-EVA Won't go, huh?

CDR-EVA No. Will that bother you getting in?

LMP-EVA I can probably make it.

CDR-EVA Okay; get on up.

LMP-EVA *** again. Okay; why don't you hand me the neutron flux, and I'll put it - -

CDR-EVA Okay; neutron flux.

LMP-EVA - - on the platform?

CDR-EVA *** start in, and I'll get some of these bags out of the way.

LMP-EVA Well, I just *** hand them to me up here?

CDR-EVA Okay.

CC And, Jack, for your thoughts, we've agreed that you can delete the tracking light. We'd like to get you guys in as soon as possible - 7 minutes now. And we'll delete the tracking light test.

LMP-EVA Okay. That's all I can handle up here. *** one more, and I can put it up here.

CDR-EVA *** cover on this one.

LMP-EVA Got it.

CDR-EVA Stand it up because the cover won't hack it.

CDR-EVA Okay. Soon as you get on it, I'll come up to the porch.

06 23 57 46 LMP-EVA *** EVA pallet that's always in my way?

CC I think we aren't going to have one of those tomorrow, Jack, so we did away with that. We hope we're not going to have one of those tomorrow.

	CDR-EVA	Bob, we're maximizing our efforts, so just bear with us. Jack's going to be in about 30 seconds, and I'm on the ladder *** some stuff up now.
	CC	Roger. Don't - don't panic.
06 23 58 21	CDR-EVA	Well, we're not. I just don't want you to.
	CC	*** panic there, guys.
	LMP-EVA	*** stuff for me?
	CDR-EVA	Yes, sir. *** not the time to rush. It's the time to do it nice and slow and right.
	LMP-EVA	Oh, we're all right.
	CDR-EVA	Okay. You're not going to like this, but I'm going to give you this one first because I've got it in my hand.
	LMP-EVA	Either one. Oh, hang in there. I've got it. That's a heavy bag.
	CDR-EVA	That is heavy, babe. *** tell you, that's heavy.
	LMP-EVA	Okay.
	CDR-EVA	Can you reach that one? If not, I'll shove it in farther.
	LMP-EVA	Okay.
	CDR-EVA	One more coming at you.
	LMP-EVA	Okay.
	CDR-EVA	Tilting up right now.
	LMP-EVA	Go ahead.
06 23 59 58	LMP-EVA	Okay; next.
	CDR-EVA	Okay; tilting up to you.
	LMP	Got it.

CDR-EVA Okay. Next. Okay, Bob, We've got - -

LMP Up here - -

CDR-EVA - - big bag, three SRCs, and a neutron flux.

CC *** we gather an ETB is coming up with two cameras in it.

CDR-EVA ETB's next.

LMP *** ETB in.

CDR-EVA ETB has two cameras.

07 00 00 49 CC Okay. And as you guys say farewell to the Moon, we're looking up to the Earth down here where you guys are returning pretty soon.

CDR-EVA Okay.

LMP You're going to have to push that.

CDR-EVA Okay; let me get it. That's all right. *** until you're ready. *** make it?

LMP I've got it. Okay; let me get that other thing in here.

CDR-EVA Bob, *** Gene, and I'm on the surface and as I take man's last steps from the surface, back home, for some time to come, but we believe not too long into the future. *** just list *** believe *** will record that America's challenge of today *** forged man's destiny *** tomorrow. *** as we leave the Moon at Taurus-Littrow, we leave as we came and, God willing, as we shall return, *** peace and hope *** all mankind. Godspeed the crew of Apollo 17.

CC Roger, Geno. Thank you very much.

CDR-EVA I am up on the ladder, and I'm going to be going through the hatch.

LMP I've got to get out of your way.

	CDR-EVA	Yes.
	LMP	Okay.
07 00 03 14	CDR-EVA	Okay. Let me *** babe *** I come.
	LMP	Come on in.
	CDR-EVA	Hatch look good to you?
	LMP	Still looks dirty. Okay; keep her down - buttoned. Come towards me a little - There you go. Okay; you've got it.
	CDR	Okay; I'm inside the hatch.
	LMP	Okay.
	CDR	Let me look - let me see that hatch once more.
	LMP	Okay.
	CDR	*** last time we want to have to - open that.
	LMP	Caught in the same way again.
	CDR	I can see down there.
	LMP	I can see - it's - -
	CDR	Does it look good to you?
	LMP	- - it's clear.
	CDR	Okay.
	LMP	There is a little bit of dust, but it's all in the - I don't think ...
	CDR	If I can turn around.
	LMP	Yes, I've got to get out of your way.
	CDR	Yes, I'll wait for you. Can you move back?
	CDR	Yes, now I can.

	LMP	Okay; I've got to get my hand over here. Okay; I'm out of your way.
	CDR	Okay. And - -
	LMP	Close the hatch.
07 00 04 44	CDR	Hatch is closed. Let's see if I can lock it.
	LMP	*** got to turn our H_2O off. We've got to turn our - let's turn our water off first, before you lock it.
	CDR	Well, it's locked now. Can you get your own water? If not, I'll get it - -
	LMP	I doubt it. *** able to before.
	CDR	Okay; I'll get it.
	LMP	Have you got yours?
	CDR	*** see.
	LMP	Mine's off. No, wait a minute. I can't get it.
	CDR	Okay. I'll get it for you. And before you move anymore, let me get over here out of the way.
	CC	Okay. And pay attention here, 17. When you come on, we'd like you to leave PRESS REG A which is the one that's been OFF - -
	CDR	Turn around.
	CC	- - we'd like to leave that closed.
	CDR	Okay, Bob.
	CC	Just use PRESS REG B going to CABIN.
	CDR	Turn some more; I can almost reach it - another.
	LMP	Okay.
	CDR	Your AUX water is OFF.

	LMP	Okay.
	CDR	Okay, Bob, - -
	LMP	No, no. The - the PRIM water.
	CDR	Okay.
	LMP	You turn your - -
	CDR	Stand by. PRIM water is OFF.
	LMP	Is your PRIM, OFF?
	CDR	It's OFF.
	LMP	Okay.
07 00 06 17	CDR	Okay. PLSS PRIM water closed. Port hatch CLOSED and LOCKED. I've got to get the upper valve, Jack. Move in.
	LMP	Okay. How's that?
	CDR	That ought to do it.
	CDR	*** got the lock on it. Okay, now. Bob, say again which REG A you want left.
	LMP	REG A left closed; we got it.
07 00 06 55	CDR	DUMP valves are both AUTO; CABIN REPRESS, AUTO.
	LMP	CABIN REPRESS, AUTO.
	CDR	Okay; and I've got plenty of oxygen so we're in good shape for an AUTO REPRESS. CABIN REPRESS breaker CLOSED at 16.
07 00 07 09	LMP	Okay; CABIN REPRESS, CLOSED.
	CDR	*** baby, there it comes. *** a psi. Okay; it is increasing. You can go to CABIN on the regulator.
	LMP	REG B.
	CDR	Yes, just the one regulator B. 1.5.

	LMP	REG B is in CABIN.
	CDR	Okay; she's coming up. There's 2.0. Your next move will be to get PLSS O_2, OFF. 2.5. Okay; get your PLSS O_2, OFF.
	LMP	Mine's OFF.
	CDR	Get it?
	LMP	*** doff suits here shortly.
	CDR	If you can turn around, I'll get it for you.
	LMP	I think that I've got it. There, I got it.
07 00 08 18	CDR	Okay. Verify cabin pressure stable at 4.6 to 5.0. We'll watch it here.
	LMP	I'm watching.
	CDR	Okay; 5.0.
	LMP	5.0.
	CDR	*** got hot in here, didn't it? Okay; purge valve to DEPRESS; *** your circuit breakers.
	LMP	Say again that last one.
	CDR	You don't need your - DEPRESS with your purge valve, but you don't need it.
	LMP	Oh, yes.
	CDR	Verify your circuit breakers - white dots - ... EVA decals.
	LMP	*** dots.
	CDR	Okay; I'm squared away there.
	LMP	Am I?
	CDR	Okay.
	LMP	*** good.

	CDR	Stay at 16 now. ECS SUIT FAN 2, CLOSED?
	LMP	SUIT FAN 2, CLOSED.
	CDR	SUIT FAN DELTA-P, CLOSED.
	LMP	CLOSED.
	CDR	Caution lights are on; that's good. Until the SEP *** ECS caution *** out *** winds up.
	CDR	Doff gloves; stow on comm panel. Oh, oh. Sweet music to my ears.
	LMP	*** put them on again in a few minutes.
	CDR	I know; it's still sweet music.
	LMP	*** now.
	CDR	I have never seen so much dirt and dust in my whole life. *** not going to be able to see either one of these helmet visors.
	LMP	(Laughter) Yes, he will.
	CDR	*** careful. Okay. *** harder getting them off your ... than it is getting them on.
	LMP	I did it. Okay; helmet and gloves are off.
	CDR	My gloves are off.
	LMP	Right there.
07 00 11 12	CDR	Okay; verify safety on the dump valve. Open that.
	LMP	Okay; I verify that there. Just a minute; I want to take a double look at something down there.
	LMP	Um-hum. Yes. Okay; DESCENT H_2O valve, OPEN.
	CDR	Okay; DESCENT H_2O valve, OPEN.
	LMP	That's OPEN.

	CDR	Remove purge valves; stow in purse. *** OPS hose.
	LMP	Oh, boy.
	CDR	That lock is just tight on there, Jack.
	CDR	*** off?
	LMP	Yes.
	CDR	*** LM hoses, red to red, and blue to blue. We've got to do that this time, because we've got to *** PLSSs.
	LMP	Okay. Let me turn around here. Let me get out of your way.
	CDR	I'll get back in here. Okay; I'm out of the way now.
07 00 13 01	LMP	*** like to get off the PLSS water and get some spacecraft water, too?
	CDR	*** the next thing. SUIT ISOL and SUIT FLOW, ON; and then we'll put PLSS pump and fan, OFF. Then we'll disconnect the PLSS water and connect spacecraft water.
	LMP	*** unhook that stuff up there so you can get to your hoses.
	CDR	I can't reach it though.
	LMP	Oh, okay. Let me get it then. I can get it.
	CDR	Okay; I guess.
	LMP	*** want red to red and blue to blue. *** verify these two because - -
	CDR	Yes. Bob, you still with us?
	CC	I wouldn't leave for the world.
	LMP	Okay; I'm hooked up and locked.
	CDR	Okay.

	LMP	You want to verify? And I'll veri - I'll do it for you, if you want.
	CDR	*** if you can't find this one.
	LMP	*** the red one.
	CDR	Okay; in and locked?
	LMP	Got the red one locked.
	LMP	Let me take a look at yours.
	LMP	Okay.
	CDR	Okay; now - -
	LMP	Ready for SUIT FLOW.
	CDR	Yes, sir. Suit FLOW on both of them.
	LMP	Okay.
	CDR	Oh, man, it feels great.
	LMP	Yes sir.
07 00 14 58	CDR	PLSS pump, OFF, and PLSS fan, OFF.
	LMP	PLSS fan is OFF; *** OFF.
	CDR	Okay. Disconnect PLSS water from PGA. Connect

LM water. Boy, I never thought air could feel so cool.

	LMP	Yes.
	CDR	Okay; the PLSS water is disconnected.
	LMP	*** that's mine. Yes, that's mine. Spacecraft water.
	CDR	Mine's connected.
	LMP	How about pushing on that?

	CDR	Okay. *** but I want to see it first. Watch your helmet, Jack. You're going to scratch it.
	LMP	Got it. Yes, got it.
	CDR	You don't have your visor down, and neither do I.
	CDR	Okay; connect - PLSS mode, ON. Bob, we're both going off the air. We'll get on LM comm.
	CC	We'll be waiting for you. We're here.
	CDR	Okay; go "0," Jack.
	LMP	*** some cooling?
	CDR	Okay; zap me with it, and go "0," and then put your audio breaker OPEN and connect the LM comm. Then an audio breaker, CLOSED. Okay?
	LMP	You're loud and clear.
	CDR	Okay. Next thing, VHF B - wait a minute. *** audio breaker, OPEN, CLOSED. Okay; VHF squelch B LMP. Okay; noise threshold, plus 1-1/2.
	LMP	Yes.
07 00 18 09	CDR	Okay. AUDIO, both panels. VHF A RECEIVE, and B, OFF.
	LMP	A RECEIVE, and B is OFF here.
	CDR	Okay; mode ICS/PTT.
	LMP	Okay; ICS/PTT.
	CDR	And RELAY, OFF.
	LMP	RELAY's going OFF.
07 00 18 31	CDR	Okay; on the comm, VHF A TRANSMITTER, OFF.
	LMP	OFF.
	CDR	A RECEIVER, ON.

	LMP	ON.
	CDR	B TRANSMITTER and RECEIVER, OFF.
	LMP	OFF and OFF.
	CDR	Okay; TLM BIOMED, LEFT.
	LMP	Okay; it's LEFT.
	CDR	PCM, HIGH.
	LMP	HIGH.
07 00 18 50	CDR	VHF ANTENNA, AFT.
	LMP	AFT.
	CDR	Okay; PLSS - OPS/PLSS doffing. Disconnect OPS actuator from RCU. Let's do that for each other.
	LMP	Okay.
	CDR	Disconnect RCU from PGA. If it's off, stand right where you are, and I'll get your RCUs disconnected from the PGA right here.
	LMP	Okay; let me check off. Off, off, off.
	CDR	Okay. Let's see, OPS actuator. Disconnect RCUs from PGA. Verify fan; everything off. Disconnect RCU from PLSS. Disconnect RCU from PLSS and stow on engine cover. Okay. Ready to go on?
	LMP	Okay.
	CDR	You can disconnect your PLSS hoses.
	LMP	Okay.
	CDR	Oh boy! These really are getting stiff.
	LMP	I'm not sure how many EVAs you can get out of a suit like this.

CDR I'm not sure how many EVAs you can get out of anything. Look at the ... The ... are frozen out there; everything has just quit running. Everything quit working. I don't think you can get three EVAs in this dust unless you completely redesign your systems.

LMP Probably have to have a bigger spacecraft, so you can keep clean.

CDR Yes, but how are you going to keep all that stuff out there clean.

LMP No, but I mean you can - two compartments or something.

CDR Okay; you're first. Doff PLSS/OPS. LMP first. Stow LMP PLSS on floor. Stow Commander's PLSS on mid-step.

LMP Okay; let me turn - -

CDR Would you like that for a souvenir (laughter)?

LMP Okay; I'll hold it, if you can take your straps off. I don't mind saying but my - I won't say it. We're not VOX. We're not on hot mike, are we?

07 00 20 58 CDR Hello, Houston. Are you reading, 17?

LMP We're not. No.

CDR My right hand is going to be sore for a week (laughter). My left hand isn't going to be much better.

LMP Okay, Houston. We're back on LM comm.

CC Roger, 17. We copy you loud and clear on LM comm.

LMP Okay; you got the strap there.

CDR Yes. You got it?

LMP I got it. Let it come off.

CDR Okay.

	LMP	Doff PLSS/OPS. Stow PLSS on floor. Stow Commander's on mid-step. Can you put that up there on the floor somewhere?
	CDR	Yes, but I don't know how long it'll stay on.
	CC	And, 17. Jack and Gene, we have a couple of - In fact, we have three records here to read out to you guys. On Apollo 17, two of them; one, the longest single EVA, 7 hours 37 minutes and 22 seconds. The longest total lunar surface EVA time, 22 hours 5 minutes and 6 seconds. And in summary, the total lunar surface EVA time for the Apollo Program, 80 hours 44 minutes and 8 seconds.
	CDR	That's quite a tribute to the people who made it possible, I'll tell you. Thank you, Bob.
	CC	Roger, Geno. And I can't speak as authoritatively as some people have tonight, but for all of us around me, I'll say thank you also.
	CDR	Your words are well taken. You know how I feel.
	CDR	Jack, we want to get the PLSSs - The OPSs we want to save.
	LMP	Yes, that was great! Twenty-two hours and something?
	CDR	Over a quarter of the total time. That's okay. We want to get the OPSs off.
07 00 22 56	CC	Hey, Gene and Ron, this is the CSM CAPCOM. Thought you might be interested. Your buddy up on - above you there is chugging on and about ready to bed down himself, right now. And he did take a good look at the landing site through binoculars tonight and took a good look at Shorty Crater there, and noticed quite a lot of variations in color. That may be the same color changes you saw in that orange soil and that, but we're trying to match it up. And Farouk and Ron are working it out. We're trying to match it all up and see if we can get a comparison there.
	LMP	Excellent. Tell him we'll see him tomorrow.

CC Yes, he's counting on it.

CDR How's America looking to you, Bob?

CC Well, I'll give an update. It - it's working perfect. No problems at all, and we got good SIM bay data on everything. The UV, the IR, the lunar sounder, and everything that we - every data point we can see is just great. It's - it's just hardly any anomalies at all. Everything is just wonderful.

CDR Outstanding.

LMP Hey, get the connector plugs out, Gene. We'll keep the dust out of there if we can.

CC Gene, about this total limit of any problem there is, and it's not a problem, is we're just having to stir those H_2 tanks manually because of that limiting cycle on the pressure switch there. We could go back to AUTO, but it's easier to go MANUAL.

CDR I'll be back up there tomorrow, and I'll stir them for you. I can't - The last snap in the world is going to - -

CC Roger. And Jack and Gene, let me make a note here for you guys. There will be a series of references to this throughout the checklist but there's a general thing, and you might even put a piece of tape across it if you want to or something - rather than go through and call out all the locations. We'll leave PRESS REG A closed for the rest of the time. Might just keep that in mind.

LMP Okay, Bob. We'll - I think we'll handle that one okay.

LMP Stow OPS hose and actuator.

CDR I'm trying.

LMP Install gas connector plugs. And then Commander first, disconnect OPS antenna lead.

	CDR	Oh, oh, oh. I hit one of those ... I need new fingers. You can't see if they're bleeding or not because it's all - It's all black.
	LMP	Remove OPS and stow antenna lead. Perform OPS checkout. Report OPS pressure to Houston. Stow OPS on engine cover. Okay.
	CC	Gene, there's one thing you may be interested in as - as the Commander. We're going to have to do two burns tomorrow on America. The - the orbit - the mascons didn't deteriorate the orbit as much as everybody thought it was, so there's going to be an RCS burn about an hour prior to the - to the LOPC burn.
07 00 26 21	CDR	That's interesting, Bob. Are you going to do a DOI 3, huh?
	CC	Well, yes, I guess that's what it'll be - It's going to be an RCS burn at about 11-foot per second. It'll drop the - it'll circularize the orbit, and then we'll do the plane change burn.
	LMP	What was your pressure, Gene?
	CDR	I didn't get to it yet; I haven't taken it off.
	CC	Okay; and, 17, we'd like you to press on reasonably diligently tonight. You're just about on schedule but if we can turn off this Marine, we'd like you guys to press on. We're looking at a nominal launch time, and we've used up, of course, all the MCC-H conference, but we think you're within a few minutes of being right on. If you can press on like you did last night, we'll be in great shape.
	CDR	Okay, Bob. I never stopped doing what I wanted to do anyway even though a Marine was talking. Jack, you can tell then it's 60 - about 6100.
	LMP	Okay; CDR's OPS, 6100; LMP, 6500.
07 00 27 45	CDR	I just forgot to connect my hose.
	LMP	Which hose?

	LMP	My OPS hose.
	LMP	Yes, you got to check it out though (laughter).
	CDR	That build up the cabin?
	LMP	No, not much.
	CDR	Okay; I'm regulating 39.
	LMP	Looks like Ron got a good OPS. Hope we don't need them for transfer. Yes, I checked that thing, I thought.
	LMP	Well, I know how an OPS works.
	CDR	Now try it.
	LMP	Mine's regulating high, Gene.
	CDR	How high? Okay; mine was a - -
07 00 29 08	LMP	Okay. Okay, Houston. This is the LMP. LMP's OPS is regulating at 4.25.
	CDR	And mine's 39. Tell them.
	LMP	And the CDR's is 3.9 - 3.9. That might be - I started - Let me read it off, and let me see where it regulates at next time. I didn't have my hose locked, Bob, and it came off the first try.
	CDR	We can do that later anyway. We'll - -
	LMP	Bob, we'll take another OPS check later on when we stow them. We're pressing on. Okay; we want to - What's next?
	CDR	PLSS hoses. Remove lower - -
	LMP	Okay.
	CDR	Remove OPS - It says Commander first, so let me finish out now. Remove OPS and stow antenna leads - -

	CC	They're saying we better do that before you fill out the PLSSs because we have to verify a good one before you dump the PLSSs.
	LMP	Okay; we'll do that. Perform OPS checkout. Report OPS pressure to Houston. Stow OPS on engine cover. Stow PLSS. Okay; this is my mine. Stow PLSS hoses and upper straps. Remove lower straps. Clip straps together and D-ring together, name to name. Remove yo-yo. Stow on engine cover.
	CDR	Okay.
07 00 30 32	LMP	But I'm not going to throw my yo-yo away.