APOLLO 15 MISSION COMMENTARY, 7/30/71, GET 106:07, CM-1/1

CAPCOM Endeavour, this is Houston, over.
ENDEAVOUR Houston, this is Endeavour.
CAPCOM Roger. We've had a CAPCOM shift change here, Al, and you're coming up on the change to MONO on the pan camera, I'll let you get that, about -
ENDEAVOUR Say again, Houston.
CAPCOM Endeavour, Houston. In 15 seconds you need to change the pan camera to MONO, just a reminder.
ENDEAVOUR Okay.
CAPCOM And, Al, when you're ready, I have a P24 pad the LM visual and also a couple of changes to the flight plan. Over.
ENDEAVOUR Okay, I'm all setup and ready to copy.
CAPCOM Okay. P24 landmark track pad LM visual, T1 is 106 33 59; P2 is 106 38 06; TCA is 106 40 29; T3 106 40 57. You're on track three nautical miles north. And one note on that, use OMNI CHARLIE. Over.
ENDEAVOUR Roger. Copy P24 pad T1, starting with the times, T1 106 33 59; 38 06 40 29 40 57 off track north three miles and use OMNI CHARLIE.
CAPCOM Okay, readback's correct and change that 106 45, let me know when you're there.
ENDEAVOUR You say you have a change at 106 45?
CAPCOM That's affirmative, Al. Change where it says gamma ray gain step shield OFF, change that to read gamma ray gain step increase one step. Over.
ENDEAVOUR Understand, Gordo. It says gamma ray gain step increase one step at that time.
CAPCOM That's affirmative. Then at 106 56, delete the gain step shield on the remark there and the reason is to adjust the spectrum. Over.
ENDEAVOUR Rog, understand. You want that whole line deleted at 106 56.
CAPCOM That's affirmative, Al.
CAPCOM Endeavour, Houston. Reminder, pan camera stereo at 14 58.
ENDEAVOUR Rog.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 CDT 18:50 GET 106:16 CM-2/1

CAPCOM Endeavour Houston. It's 20 seconds to your camera T stop time.
SC Roger Houston.
CAPCOM Endeavour Houston. We verify that the lenses are tucked in you're clear to turn the pan camer OFF.
SC Roger.

END OF TAPE

CAPCOM Endeavour, Houston, if you read OMNI Charlie.
CAPCOM Endeavour, Houston; Endeavour, Houston. Give us OMNI Charlie if you read.
CAPCOM Endeavour, Houston. If you read, go OMNI Charlie.
SC Hello Houston; Endeavour. On OMNI Charlie now.
CAPCOM Okay Al. Loud and clear and you'r just about to T1. I guessed you just passed it.
SC Okay Gordon. I've been reading you right along.
CAPCOM Okay.

END OF TAPE

CAPCOM Endeavour, Houston. We're getting kind of a weak signal. Would you go to best OMNI.

ENDEAVOUR Roger. Going to (garbled)

ENDEAVOUR Okay, Houston. Endeavour. Looks like OMNI Charlie's it.

CAPCOM Roger. Understand you're on OMNI Charlie.

CAPCOM Endeavour, Houston. We can't get a data with you. We'd like you to put the DSE to low bit rate, record forward and command reset.

ENDEAVOUR Okay. Understand you want low bit rate, record forward and reset.

CAPCOM That's affirmative, Al.

ENDEAVOUR Okay, Gordo. You got it.

CAPCOM Roger. I think we're getting a little better comm now.

CAPCOM Endeavour, Houston. You're T2 now.

ENDEAVOUR Roger. I have the landing site in view.

CAPCOM Roger. Very good.

ENDEAVOUR Okay. And Houston, Endeavour. I've got the LM.

CAPCOM Roger, Al.

ENDEAVOUR I'll give you the coordinates in a minute.

CAPCOM Okay.

ENDEAVOUR But he's almost directly north of Index.

CAPCOM Roger. Understand.

CAPCOM Endeavour, Houston. You're TCA now.

ENDEAVOUR Roger.

ENDEAVOUR Okay. He's about half way between Index and the next crater off toward the North Complex. He's sitting right by a very small crater and as soon as I lose them here, I'll give you the coordinates, but he's quite plain down there.

CAPCOM Roger, Al.

ENDEAVOUR Houston, Endeavour.

CAPCOM Go ahead, Al. Houston.

ENDEAVOUR Okay, Gordo. If you look at the grid map 1 to 250 on HR2511, he's on BR .5 75.5.

CAPCOM Okay. Copy Baker Romeo .5 and 75.5.

ENDEAVOUR That's affirm.

CAPCOM Okay. Thank you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 1920 CST 106:45 GET CM-5/1

CAPCOM Endeavour, Houston. Give us Omni bravo please.
SC Okay, you've got Omnibravo.
CAPCOM Okay, Al.
SC Houston, this is Endeavour. Did the, Gim-Ray Boom is out in 2 30, in 2 minutes and 30 seconds fixed in.
CAPCOM 2 minutes and 30 seconds, Al.
CAPCOM Endeavor, Houston. One other thing if you don't have it already. We'd like you to have the S-band squealch OFF so you'll realize the loss of signal. Over.
SC roger, Gordo. I've got it off now.
CAPCOM Okay.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71, CDT 19:30 GET 106:55 CM-6/1

CAPCOM Endeavour Houston. 30 seconds now to T stop for the mapping camera.
ENDEAVOUR Roger Carl, I'm all set for it.
CAPCOM Endeavour Houston. When you have a minute, I have another pan camera pass.
ENDEAVOUR Okay, I'm ready. Go ahead.
CAPCOM This one goes at 108:10.
ENDEAVOUR Roger.
CAPCOM Okay. T start is 108 15 27, and T stop is 108 43 15. Over.
ENDEAVOUR Understand. T start is 108 15 27. T stop is 108 43 15.
CAPCOM Roger. The last seconds on the T stop are 43 15. Is that what you've got?
ENDEAVOUR That's correct, Gordon, on 15, 4315.
CAPCOM Okay. For the information the LM troops are in the middle of receiving now. Dave is standing up in the hatch and taking the panoramic pictures.
ENDEAVOUR Very good.
CAPCOM Endeavour Houston. Go ahead.
ENDEAVOUR Houston, Endeavour did call.
CAPCOM Endeavour Houston. Over.
ENDEAVOUR Houston Endeavour. Go ahead.
CAPCOM We'd like you to bring up the high gain. Use pitch minus 38 and yaw 186. Over.
ENDEAVOUR Roger. Standby. It's -38, 186.
ENDEAVOUR Okay Houston, Endeavour. You've got the high gain now.
CAPCOM Okay Al. Thank you.
END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 1940 CST 107:05 GET CM-7/1

CAPCOM Endeavour, Houston. Would you give us auto on the high gain.
SC Roger, Houston. Auto on the high gain.
CAPCOM Thank you, Al.
CAPCOM Endeavour, Houston. Over.
CAPCOM Endeavour this is Houston. Over.
SC Houston, Endeavour. Go ahead.
CAPCOM Okay. The SEVA is over. They're going back in and buttoning up the LM for your information and also we're comtemplating another VHF COM check on the next rev. It will occur around 108 32 at the time you come over the LM horizon and probably interfere with your photo of the caucasus mountains. We'll have more procedures after AOS. Over.
SC Okay, Gordo. That sounds fine.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/30/71, GET 107:15, CM-8/1

CAPCOM Endeavour, Houston, we're about to LOS. So see you next time around.
ENDEAVOUR Okay, Gordo, see you on the other side.
CAPCOM Roger.

END OF TAPE

CAPCOM Endeavour, this is Houston. Over.
ENDEAVOUR Hello, Houston. Endeavour.
CAPCOM Okay, Endeavour.
ENDEAVOUR Hello, Houston. Endeavour.
CAPCOM Roger, Endeavour. This is Houston. We're going to run the comm check coming up here, but we'd like to go ahead and get the procedures in the flight plan as we go and I'll give you a hack before the pan camera start time. The pan camera status by the way is running about 70 percent - Okay. Getting about 70 percent good pictures and we're going to nominal procedures. Over.
ENDEAVOUR Okay, Gordo. Understand.
CAPCOM Also, Al. Your orbit is looking good. It's performing or behaving as the Fido's expected. Over.
ENDEAVOUR Roger. Understand.
CAPCOM When you have a free moment Al let me know and I'll give you the switch positions to get set up for the comm check.
ENDEAVOUR Okay, Gordo. Stand by just one please.
ENDEAVOUR Okay, Houston. Endeavour. Go ahead.
CAPCOM Okay, Al. You can go ahead and throw these switches as I call them out to you. Put vhf ama to simplex and the vhf antenna to right. Over.
ENDEAVOUR Okay. Understand vhf a simplex and antenna right.
CAPCOM Okay. And then check on whatever audio panel you're using probably 9 at vhf AM TRs and TR.
ENDEAVOUR Roger. That's verified.
CAPCOM Okay. That's all there is until about 108:32 at which time I'll call you and then anytime in about a 12 minute band there you can initiate a vhf comm check when it doesn't interfere with the photo target there.
ENDEAVOUR Okay.
CAPCOM I'll give you a hack when you're within range of the LM.
ENDEAVOUR Roger.
CAPCOM Endeavour, Houston. Reminder about slightly less than 4 minutes now to T start for the pan camera.
ENDEAVOUR Roger, Houston.
ENDEAVOUR Houston, Endeavour.
CAPCOM Endeavour, Houston. Did you call?
ENDEAVOUR Roger, Houston. Just reporting that the gamma ray boom retract time was 3 plus 07.
CAPCOM Roger. 3 plus 07.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/30/71, GET 108:14, CM-10/1

CAPCOM Endeavour, Houston. Don't bother to acknowledge. Fifteen seconds to pan camera T start.

CAPCOM Endeavour, Houston. Would you verify that the mapping camera image motion switch was to increase? Over.

ENDEAVOUR Houston, Endeavour. That's verified.

CAPCOM Okay. You got it a couple of minutes ago, is that right?

ENDEAVOUR Yeh, that's right, Gordo. At 21.

CAPCOM Okay, fine. It looked funny on the other data here. All checked.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 2058 CST 108:24 GET CM-11/1

ENDEAVOUR Houston, Endeavour.
CAPCOM Endeavour, Houston. Go ahead.
ENDEAVOUR Okay, Houston. Gordo, I'm just coming up over LeMonnier, now, heading towards Serenitatis and finished that photo strip from piras to LeMonnier. You might tell the king that the strip looks pretty good. I got some conversion stereo on Romer on the way over and right now I'm directly above one of the litro ridges and it has quite distinct relief, I'm really surprised at the amount of relief that the bridge has from here and I won't take a picture it because we got a couple yesterday, but it's really quite distinct. And I can look out to the north and look at Posidonius and there's a very, along the narrow portion of what looks like the lake bed part of the fill in the marefloor. It looks very similar to what you'd see on a lake shore, very distinctive color, light color on the banks and a darker color in the marefloor and what looks like some very positive relief, almost as if there was a lava flow that came out around the edge of the slab that was titled and flowed down into the low spot of the floor.
CAPCOM Okay, Al. Very interesting. Change the subject. We're now, should be within line sight of the LM so stand by while I get a quick check, see if they can take a COM check.
ENDEAVOUR Okay, fine.
CAPCOM Al. Go ahead with it and see if you can raise them.
ENDEAVOUR Okay. Hey, Falcon this is Endeavour. How do you read me?
ENDEAVOUR Hello Falcon this is Endeavour.
ENDEAVOUR Hello Falcon, Endeavour.
CAPCOM Falcon and Endeavour this is Houston. Evidently, neither of you are reading each other. We'll stand by until we get overhead and give it another try. I'll give you a cue. Over.
ENDEAVOUR Okay, Gordon. I'll keep trying here, a couple times.
ENDEAVOUR Falcon, Endeavour. How do you read?
FLACON Hey, I hear you're trying to call. Go ahead.

END OF TAPE

FALCON Falcon Endeavour. How do you read?
ENDEAVOUR Hello Falcon, this is Endeavour, I read you.
ENDEAVOUR Hello Falcon, Endeavour.
FALCON Hey, you're coming in fine and square David. How did it go? Hey that sounds neat I think I got you on the last pass too. Yes sir, I can see Index just as clear as a bell.
FALCON We are right down the line, mark. Luke and Index.
ENDEAVOUR How do you read now, Dave?
FALCON All broken (garble).
ENDEAVOUR Okay, let me try another antenna.
FALCON Okay.
ENDEAVOUR Okay, how do you read now?
FALCON Okay, that's a lot better.
ENDEAVOUR Okay. Gee, that sure is a pretty sight down there, pal.
FALCON Can you see Index at altitude now. Can you see any shadows to identify?
ENDEAVOUR Say it again Dave.
FALCON Can you identify Index Crater as you go over the landing site now?
ENDEAVOUR Yes, I can do that with naked eye right now. I'm just coming up on you now and I can see Index from here.
FALCON Hey, Houston, Falcon standby.
FALCON Okay, Endeavour, Falcon, I guess you're over the hill because we don't read you now.
ENDEAVOUR Hey, negative, negative. I'm just coming up on you.
FALCON Oh, okay. You're broken a little bit. As you go by see if you see any shadows in Index. I never saw it on way in.
ENDEAVOUR Hey listen, I've got Index with just looking out the side hatch window, right now. Those four craters ending in Index are just as clear as a bell right now.
FALCON Okay. Do you see us through a relative to Index?
ENDEAVOUR Yes I did. I can't see you now, but on the last pass I picked you up, and you're just to the North and just a little bit West of Index.
FALCON Okay, I think that's just about right.
ENDEAVOUR Yeah, did you get the coordinates off the map?
FALCON Yeah, we got the ones you passed to Houston. We also got the ones that are in the back room, and I guess we're discussing noise level kind of numbers now within a 100 meters or so of where we really are. I think we're pretty well located.
ENDEAVOUR I'm right over you now pal, looking down.
ENDEAVOUR I hope the view is as fantastic down there as it up here.

FALCON I'm telling you. It really is.
CAPCOM Endeavour, Houston.
CAPCOM Endeavour, Houston.
CAPCOM Endeavour, Houston. If you're reading put the pan camera on Mono and also add -
SPEAKER Houston, comm tec. Goldstone comm tec.
SPEAKER Houston, comm tec, Goldstone comm tec, nettwo.
SPEAKER Houston, comm tec, Goldstone comm tec net two, contact.
CAPCOM Endeavour Houston, go ahead.
CAPCOM Endeavour this is Houston. Go ahead. Over.
ENDEAVOR Had a photo pass just coming up on the landing site that time. Was a photo target 25 (garble) which I skipped to do the VHF VOICE check.
CAPCOM Endeavour, this is Houston. Over.
ENDEAVOUR Hello, Houston, Endeavour.
CAPCOM Okay, you've been loud and clear. We've been balled up on a site configuration problem here, but I think we're back with it. We have one question. Your T stop for the pan camera now, we wondered it you went to mono on the pan camera at 3 minutes and 20 seconds before T stop. Over.
ENDEAVOUR Negative Gordo. I got tied up in that VHF check.
CAPCOM Roger.
ENDEAVOUR Want me to go mono, now?
CAPCOM Go to standby now, Al. We're past the T stop time.
ENDEAVOUR Okay Gordo, sorry about that we're in standby now.
CAPCOM No problem, that was our fault for the comm problem. We heard the com checks and it sounded good. Your're clear to go back to normal configuration on the VHF whenever you get a chance.
ENDEAVOUR Okay.

END OF TAPE

CAPCOM You're clear to go back to normal configuration on the VHF whenever you get a chance.
SC Okay.
CAPCOM ENDEAVOUR, Houston. We'd like the Gamma Ray gain Step Switch one step up. Over.
ENDEAVOUR Roger. Gamma Ray gain Step one step up now.
CAPCOM Okay, Al; thank you.
ENDEAVOUR Okay. And if you want to let me know on the band Camera Power, whether the LM's in or not.
CAPCOM Okay. The LM's ear is tucked in and your cleared to turn it off.
ENDEAVOUR Okay.
CAPCOM Ed, the Gamma Ray boom is going out now.
ENDEAVOUR Okay.
CAPCOM Mark barberpole. And the mass spec boom is going out.
ENDEAVOUR Mark. Barberpole.
CAPCOM Roger.
CAPCOM ENDEAVOUR, Houston. Would you give us auto on high gain please.
ENDEAVOUR Auto on high gain.

END OF TAPE

CAPCOM Endeavour, this is Houston. 30 seconds to T stop on the mapping camera. Over.

ENDEAVOUR Okay, Gordo. Thank you. Got you.

CAPCOM Endeavour, Houston. I have the TEI 26 pad for you. Over.

ENDEAVOUR Okay, Houston. Stand by just one.

CAPCOM Okay. I'm standing by.

ENDEAVOUR Okay, Gordon. I'm ready to copy.

CAPCOM Okay. TEI 26. SPS/G&N, NOUN 47 is 37354 plus 060 plus 097, TIG is 129 22 2554, NOUN 81 is plus 30312 minus 13271 minus 03087. Attitude is 180 092 339, ullage is four jets for 12 seconds. And other remarks, lamda at TIG equal plus 172.93. Go ahead.

ENDEAVOUR Okay. TEI 26 SPS/G&N, 37354 plus 060 plus 097, 129 22 2554, plus 30312 minus 13271 minus 03087, 180, 092, 339. That's four jets for 12 seconds and lamda TIG is plus 172.93.

CAPCOM Okay, Al. Your readback is correct and another comment. I think earlier we led you to believe that you shouldn't use the systems test meter. We retract that. We think the systems test meter is okay and use it any time you feel a desire to. Over.

ENDEAVOUR Oh, okay. Fine, thank you.

CAPCOM And we're still missing the deploy time on the booms there back earlier. If you've got them written down and you want to get on just give them to us any time you have time.

ENDEAVOUR Okay. I'll - Let me dig for them.

ENDEAVOUR Gordo, on these boom deploy times and retract times I don't have all of those times each time I do it precisely because it happens that I'm off busy doing something else and I miss the barbarpole so I don't have all of them.

CAPCOM Okay. I'm sure it's not a matter of life or death.

END OF TAPE

ENDEAVOUR Houston, Endeavour.
CAPCOM Go Al.
ENDEAVOUR Okay. Did you get the gyro torquing angles on that P52, Gordo.
CAPCOM That's affirmative. We got them.
ENDEAVOUR Okay. I torqued them out at 109:07.
CAPCOM Roger. 109:07 and for your information there's one minute till all those items on the SIM bay coming up.
ENDEAVOUR Okay.
CAPCOM Endeavour, Houston. Over.
ENDEAVOUR Houston, Endeavour. Go ahead.
CAPCOM A couple of requests for you here. We would first of all like a mass spectrometer discriminator switch to low. Over.
ENDEAVOUR Okay. Mass spec discriminator is in low.
CAPCOM And we're ready for an E mod and we'd also like to ask you for a crew status report. Over.
ENDEAVOUR Okay. The E mod is coming your way and stand by a minute and I'll give you all the status.
CAPCOM Okay.
ENDEAVOUR I guess just - if you want just crew status report doing just fine. I don't know what else you can say.
CAPCOM Can you give us how much sleep you got last night. And also your PRD readouts.
ENDEAVOUR Okay. I got apparently a bad PRD so I haven't been keeping track but I will if you want. But I've got Dave's PRD. And let's see. I guess you didn't get a status report this morning. I got - I think all three of us got 7-1/2 hours of sleep last night. I got mine all in one segment. And I've taken no medication today.
CAPCOM Okay, Al. Fine. That was the problem we didn't get this morning's report. One other quicky. If you'll comment if we're throwing too many reminders up from the ground here or not enough. We're just trying to get a feel for whether we're harassing you or helping you. On the timing callouts.
ENDEAVOUR Gordo, I think - yes, yes. I think if you don't expect me to answer it's a great help to me because I do find that I'm trying to be three places at once in here and if I'm doing a P52 I can't be over working the SIM bay at the same time. So the reminder is good. I can always break into a P52 to go turn something off but bearing in mind that I don't have a mission timer in the lower equipment bay, it's a little difficult for me to keep track of the time sometimes so I do appreciate it.
CAPCOM Okay. We'll keep them coming. If

APOLLO 15 MISSION COMMENTARY, 7/30/71, 21:37 CDT, 109:03 GET, CM15/2

CAPCOM they at any time become too much just shut us up.

ENDEAVOUR Okay, Gordo. Appreciate it. Thanks troop.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/30/71 CDT 21:52 GET 109:14 CM-16/1

ENDEAVOUR Okay, Gordo. Appreciate it, thank you, sir.

CAPCOM Endeavour, Houston. We got about 2 minutes until LOS, we still need the onboard readings but if they were all nominal, just say so, we'll get them some time later. And that's about all we have for you 'til tomorrow morning. Over.

ENDEAVOUR Okay. Onboard readouts BAT C were 37; PYRO BAT A was 37; PYRO BAT B 37; RCS ALPHA was 73; BRAVO 71; CHARLIE 72 and DELTA 73.

CAPCOM Okay. We copy all that.

CAPCOM Endeavour, Houston. One last thing, the INCO's running behind on his DSE rewind, if it's not rewound when you LOS, you'll have to do those - perform all those verifies yourself. Over.

ENDEAVOUR Okay, Gordo, we'll do it.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 1240 CST 112:06 GET CM-17/1

CAPCOM Endeavour, Houston. Over.
CAPCOM Endeavour, Houston. Over.
CAPCOM Endeavour, Houston. Over.
ENDEAVOUR Houston this is Endeavour.
CAPCOM Roger, Al. Sorry to wake you up again, but we need reacquire and narrow with angles of PITCH plus 25, YAW 185. Over.
ENDEAVOUR Okay, Houston. You've got REAC NARROW PITCH plus 25 and a YAW of minus 185. How do you read me?
CAPCOM Roger. Read you much better now, Al, sorry about that. Good night again.
ENDEAVOUR That's okay. I wasn't asleep yet. I was waiting for your call.
CAPCOM Okay. Anything else you want to tell us?
ENDEAVOUR No. I was just wondering what you wanted setting on the high gain is all.
CAPCOM Okay.
ENDEAVOUR Okay, Bob, I understand mass spector discriminator to low.
CAPCOM Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/31/71, GET11848 CDT722 CM18/1

CAPCOM Alfredo, Houston is calling. How are you doing up there?
ENDEAVOUR Good morning Houston. This is Endeavour doing fine. Read you loud and clear.
CAPCOM Glad to hear from you Endeavour. We'd like to have ACCEPT when you have a chance to reach up that direction.
ENDEAVOUR Okay, you've got it.
CAPCOM Roger and down on panel 230 mass spectrometer multiplier high at your convenience.
ENDEAVOUR Okay discriminator is in high.
CAPCOM Thank you and I've got that batch of updates there whenever you can copy.
ENDEAVOUR Okay, I'll wake up first.
CAPCOM Go ahead. Enjoy it. Now on that mass spectrograph we want the multiplier high and the discriminator low.
ENDEAVOUR Okay, understand. Multiplier high and discriminator low.
CAPCOM That's - that's the right way, yeah.
CAPCOM And if you can reach up to the panel 3 there we'd like high gain auto at your convenience.
ENDEAVOUR Okay, you have it.
CAPCOM And Al the computer is yours at anytime.

END OF TAPE

ENDEAVOUR Okay, Houston. This is Endeavour. I'm ready to copy some updates there, Carl.

ENDEAVOUR Hello, Houston, Endeavour.

CAPCOM Endeavour, this is Houston. First thing we'd like get through to you are the mapping camara photo pads over on the next page at 11930.

ENDEAVOUR Okay, Carl. Go ahead.

CAPCOM Start 1193433. Stop 1213302. And a note to that is that the -- the extend retract times on the mapping camara seem to be getting longer with time and until further notice, we'd like for you to record and send down the DELTA-T on each extend and retract.

ENDEAVOUR Okay, understand. Yes, those times do seem to be getting longer and I'll record DELTA-T and tell you what they are.

CAPCOM Roger, and over there at 119 20. On the mass spectrometer boom retract. It says record the retract time DELTA-T. Instead of in barber pole, we want all of these in the future from switch on to gray. That corresponds to what we can monitor here on the ground and we we need to calibrate comparison of your data and ours. I'm sorry, that's not what we wanted. Just a -- just a --

ENDEAVOUR (garble) switch on to gray.

CAPCOM Right. That compares with our test calibration data. That's what I should say.

CAPCOM And while I'm reading up --

ENDEAVOUR Okay.

CAPCOM While I'm reading up to you, I'd also like to get something in on the ECS radiators to the outlet temparature is running high 10 to 15 degrees -- primarily radiator outlet temperature and we like for you to verify first of all that flow control on the ECS radiator. There's auto and power. Is that the way they're setting?

ENDEAVOUR That's verified. Auto and power.

CAPCOM Okay. And 3 circuit breakers over on panel 5. ECS radiators, controller AC1 and AC2 should be closed and also controller heaters main A should be closed -- all three closed.

ENDEAVOUR Yes, that's verified, they are all closed.

CAPCOM Okay, thank you. You got a status report to send down to us?

ENDEAVOUR Okay. Got about 5 and a half to 6 hours of sleep in 2 seqments, my PRD is reading 23105 but I'm not sure that's any good. And no medication and standing by for consumables update -- the rest of it.

CAPCOM Roger.

CAPCOM Consumables update. Are you ready?

ENDEAVOUR Rog, go ahead.

CAPCOM The time is 11800. RCS total is 60 -- is 63.

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 118:55 CDT 7:27 CM-19/2

CAPCOM Quad A 63 64 61 64. H2 tank 1, 76.9 75.6 51.9. O2 tank 1, 79.3 82.5 61.7.

ENDEAVOUR Roger. On the consumables.

CAPCOM Al, if you can listen while you work, I got a couple of short goodies for you before you go around the corner. First of all, the experimenters on the SIM bay are as happy as can be. I think on the gamma ray experiment, they say on that first rev data, they have enough to justify the whole flight. They are so happy with it. I have a more complete science report for you which I will send up on the next rev. And just bringing you up to date on the news, the (garble) down on the surface will be beginning on schedule in just about one hour.

ENDEAVOUR Hey, that all sounds real good, Carl, and you can see I'm practically over T52 here. I'll have the (garble) power charts and torquing angles here in just a second.

CAPCOM Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET11904 CDT0738 CM20/1

ENDEAVOUR and if you've got those torquing angles out, get them on the minute.

CAPCOM We don't have any CMC data at the present time. You'll have to read them down to us Al.

ENDEAVOUR Okay, Carkm I'll read them to you. P52 stars were 01 and 36. Torquing angles were minus 3 balls 28 minus 3 balls 58 plus 3 balls 12 and they were torqued out at 119 05 on the minute.

CAPCOM We copy all of that loud and clear. Thank you.

CAPCOM And as you go around the corner Al, all your systems are looking good.

ENDEAVOUR Roger, Carl, thank you. See you on the other side.

CAPCOM Roger.

END OF TAPE

ENDEAVOUR Hello (Garble) Endeavour.
CAPCOM Endeavour, this is Houston. How are things going up there.
ENDEAVOUR Roger, Karl. Going okay, I think we might have a problem also with the mass spec boom. Let me give you some times, here. The mapping camera retracted in 4 minutes and 30 seconds. The gamma ray retracted in 2 minutes and 30 seconds. I'm sorry the mapping camera extended in 4 minutes and 30 seconds. Gamma ray retracted in 2 minutes and 30 seconds. And the mass spec I let retract for about 4 minutes, didn't get a gray, went to deploy for a few seconds back to retract for a few seconds and it finally went gray and retract. So I don't really have a good accumulated 5 on how long it was barber pole.
CAPCOM We copy.
CAPCOM Al, you may be interested to know that Dave is walking around on the lunar surface, now.
ENDEAVOUR Very good, very good.
CAPCOM And I have a mapping camera pad and a - -
ENDEAVOUR I knew it would -
CAPCOM - - and a flight plan update for you when you have a chance to copy.
ENDEAVOUR Okay, you caught me right in the middle of breakfast. Stand off on that for awhile.
CAPCOM No rush, no rush.
CAPCOM Al this is Houston. Why don't you go ahead and eat and let me read up the science summary to you.
ENDEAVOUR Hey, good idea Karl. Go ahead.
CAPCOM Okay, here we go. In general all orbital science experiments are working very well and we have some very happy principal investigators. The X-ray PI reports count rates higher than expected which gives good facial resolutions. Real time data shows a signature of magnesium, aluminum and silicone so far. And appear to be differences cropping up between the mare and the highlands. The mass spectrometer PI reports good operation with many peaks appearing and so far they've clearly identified neon and argon. Gamma ray is happy with improved data since seperation of the LM. And spectral features are appearing in the data. The alpha particle experiment reports seeing a radonmpeak over Procellarum and possibility of some other peaks over other areas of the moon. Let you know more about - more about that later. The photo team tells us that the mapping camera is working well. The laser is going great. The pan camera appears to be getting about 80 percent of its frames in good - in good quality to despite the V over H sensor problem. And in general they say keep up the good work. It's looking great.
ENDEAVOUR Okay, what's the matter with the V over H on

ENDEAVOUR the pan camera. You indicated yesterday that there was a problem, but nobody ever explained what the problem was.

CAPCOM Roger, Al. I'm not sure that its well understood. It's - all you can say is that it's operations are errattic. Sometimes it manages to get the - the motion compensation right and sometimes it doesn't quite make it. That's the problem we're working on down here trying to understand - -

ENDEAVOUR I understand.

CAPCOM - - greater detail.

ENDEAVOUR Yes, okay.

END OF TAPE

CAPCOM Endeavour, let's have high gain antenna AUTO, please.

ENDEAVOUR A go in AUTO. Karl, if you've got a paper and pencil there while I'm, while I'm finishing up breakfast here, let me run down some camera magazines with you.

CAPCOM Good.

ENDEAVOUR I took inventory of all the mags last night. And thought I might just read through the list for you.

CAPCOM Okay, hold on a second.

ENDEAVOUR -- is left on the mag now.

CAPCOM Hold on a second and I'll copy those, but there's a flight plan change in just a few minutes I'd like to get to you. The mapping camera image motion which is scheduled at 120:10, we'd like to have at 120:16.

ENDEAVOUR Okay, understand, you want to slip that down to 120:16.

CAPCOM That's correct.

ENDEAVOUR Mapping camera image motion increase.

CAPCOM That's affirmative, Al, and go ahead with your readdown.

ENDEAVOUR Okay, as promised to Spencer, the mags are as follows. First the 16 millimeter stuff; mag A's been used a hundred percent; mag B's been used a hundred percent; C and D haven't been used; E's been used about 4 percent; F is still full; G is full; H has been used 25 percent; I, full; J, K, and L are full. Okay, on the Hasselblad, I'll call out the number of frames used. Okay, mag M, metro 100 1, 5, 3, are the frames used; and nectar is 4, 2; O is 3, 9; and V, Q are 0; R is 20; and F is 40. And no 35 millimeter film has been used.

CAPCOM That came through loud and clear, Al.

ENDEAVOUR Okay,

ENDEAVOUR Houston, Endeavour.

CAPCOM Endeavour, this is Houston, go ahead.

ENDEAVOUR Okay, just thought I'd orient you a little bit as to where I am, Karl. At the present time, I am directly over Picard, and I'm coming up on Proclus here very shortly. And from this particular angle, looking at Proclus, the phase pattern out of Proclus is really magnificent; it covers, oh,I'd say, about 240 degrees of arc and you can the see ray pattern way, way out in the Crisium, way out into the highlands, both north east and south of Proclus. And the excluded zone is very well defined, it's very clear where the exclusion is. I'll give you a little better description when we get up close to it.

CAPCOM That sounds fantastic, Al, do you think you're going to solve the secret of that excluded zone?

ENDEAVOUR You never know.

END OF TAPE

CAPCOM Al, could you please confirm that your H2 fans are off?
ENDEAVOUR Negative, Karl, they are on. Sorry about that.
CAPCOM Okay, we'd like to have them off, Al.
ENDEAVOUR Okay, they're off.
CAPCOM And they've just been deploying the TV camera on the lunar surface and we had some of our first looks at Hadley Delta and St. George and what do you know, it looks just like all the pictures they've been drawing for us.
ENDEAVOUR Hey Super. Sure looks the same from up here.
CAPCOM Endeavour, 15, could we please have optics zero.
ENDEAVOUR Roger, optics zero.
CAPCOM And we've got 10 seconds for changing image motion on the mapping camera, Al.
ENDEAVOUR Rog.
CAPCOM Al there's no rush on it, but I'm waiting for your cue before I send up Flight Plan update.
ENDEAVOUR Okay, Karl, I'll be ready in a minute.
CAPCOM Endeavour, this is Houston. Rover has just hit the ground, you don't see it down below you do you?
ENDEAVOUR I'm not quite there yet, Karl, but I'll look when I go over.
CAPCOM Roger.
CAPCOM Endeavour, we'd like to have pan camera power OFF.
ENDEAVOUR Okay, all turned off now.
CAPCOM Thank you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 CST8:48 GET120:22 CM24/1

CAPCOM Endeavour, the first part of that flight plan update, is to delete the gamma ray boom deploy at 120 33. We want to be sure and get that one. Delete gamma ray boom deploy.

ENDEAVOUR Okay, Karl, I'll delete it.

ENDEAVOUR Okay Karl, it looks like I'm set for business for the day now, and go ahead with your flight plan update.

CAPCOM Okay, Al, and first of all on the gamma ray boom, the reason for that, is the fact that we're getting a little gain change everytime that we deploy and retract it. It's not serious but we'd like to sort of leave it as it is until we study the problem a little longer. You've already deleted the extension at 120 33. We also then will delete the retraction at 121:27.

ENDEAVOUR Okay, 121:27, rog.

CAPCOM And while you're on that page, the mapping camera photo -

ENDEAVOUR (garble)

CAPCOM Roger, and while you're on that page the mapping camera photo pad is as follows: Start 121 39 34, 122 32 43, would you like to read that back?

ENDEAVOUR Okay 121 39 34 and T stop is 122 32 43.

CAPCOM That's correct and just on the same page again, the attitude - the attitude there at 121 37, instead of reading a roll angle of 000, should be 142, that's for the P20 option time.

ENDEAVOUR Okay understand roll angle of 142.

CAPCOM That's correct. The next correction is all the way up at 125 hours and 44 minutes.

ENDEAVOUR Okay, go ahead.

CAPCOM And this is one of those general things. On reporting the Delta p, it should be from switch on to talk back gray.

END OF TAPE

ENDEAVOUR Okay.
CAPCOM And we have exactly the same thing at 129 hours and 20 minutes.
ENDEAVOUR What was that again? What time was that?
CAPCOM At 129:20 is the same thing, the Delta-P that you read back to us is switch on to talkback gray, and really, I suppose, we should make this a generality that we don't have to put it in the flight plan every time.
ENDEAVOUR Rog. I agree with that.
CAPCOM Incidentally, I have a question in that connection. Says verify that times previous to 118 hours were from switch on beginning time. Do you recollect that?
ENDEAVOUR Karl, we - we type it onboard here (garble) switch and then look at the mission timer. Now the gamma ray is taken about 6 seconds to go from switch on to barberpole, the mass spec was going on immediately to barberpole, so it didn't make any difference in the case of the mass spec. And in the gamma ray the most it could be off is 6 seconds.
CAPCOM Right, and I guess on the gamma ray when you reported the time, do you recall which it was that you were giving us - switch on or talkback barberpole?
ENDEAVOUR Talkback barberpole.
CAPCOM Okay, fine. That's the way the instructions were originally.
CAPCOM We have a comm change, it's simply an error in our flight plan at 128:10.
ENDEAVOUR Okay, go ahead.
CAPCOM And at 128:10 the first step in that configuration is VHF AMA simplex. The second step is to change VHF AMB, delete duplex and make that OFF.
ENDEAVOUR Okay, understand you want duplex AB and B OFF.
CAPCOM That's correct and at 149 hours 37 minutes we do the same thing.
ENDEAVOUR Okay, good.
CAPCOM And at 149:37 we also want to add mode VOX.
ENDEAVOUR I understand, mode VOX.
CAPCOM Roger and I thing the last item to come up is again the comm change at 169 hours and 20 minutes, that we put A simplex and B off.
ENDEAVOUR Okay, roger got those.
CAPCOM Okay that takes care of our current flight plan updates.
ENDEAVOUR Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 120:44 CDT 9:19 CM 26/1

CAPCOM Incidentally, Al, we'd like to have the gamma ray gain step go through its usual procedures here, even though we don't have the boom extended.
ENDEAVOUR Okay, Karl.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 CST 9:29 GET120:53 CM27/1

CAPCOM Al, we'd like to have the gamma ray gain set back to the center position, please. Endeavour, this is Houston. The down link doesn't seem to be coming through very good, could you give me a comm check?
ENDEAVOUR Hello Houston, Endeavour, how do you read?
CAPCOM Roger, that's loud and clear, thank you.
ENDEAVOUR Okay, I'm back on Vox now, Karl.
CAPCOM Okay, good.
CAPCOM Endeavour, this is Houston. Surface activities are coming along swimmingly at the present time. The rover has already been driven, made one circle around the LM so far and they're about ready to take off on traverse number 1.
ENDEAVOUR Oh, very good, got the rover going, huh.
CAPCOM Roger, that's good news.
ENDEAVOUR Good
CAPCOM And a time reminder here over at 21 03 is the time to configure the DSE as you go around the corner.
ENDEAVOUR Okay Karl, 21 03.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 121:03 CDT 938 CM28/1

CAPCOM Al, this is Houston. As spacecraft Endeavour swings majestically around the eastern limb of the moon. All systems are go.
ENDEAVOUR Hey, I'm suppose to say that.
CAPCOM Oh, okay.
ENDEAVOUR See you on the other side, Karl.
CAPCOM Righto, see you there.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 121:53 CDT 10:27 CM29/1

CAPCOM Endeavour, this is Houston, how do you read?
(Garble)
CAPCOM Endeavour, this is Houston, how do you read? Do we seem to have a small comm problem, please stand by.
ENDEAVOUR Houston, Endeavour is standing by, I'm reading you 5 square.
CAPCOM Roger, and I'm reading you loud and clear. With a good bit of noise over the top of you.
ENDEAVOUR Rog.
CAPCOM Endeavour, this is Houston, we'd like you to go ahead and try acquisition of the high gain antenna with the angles in the Flight Plan.
ENDEAVOUR Roger, Houston, stand by for one minute.

END OF TAPE

CAPCOM Endeavour, this is Houston. The information we have on your attitude indicates that you're a little bit off for those forward obliques; and we'd like to see your noun 78 if possible.

ENDEAVOUR Okay, they were as per flight plan. In fact, Karl, I wanted to mention that to you. When I loaded noun 78 with plus 126.30 and plue 045.77, the computer came up with an angle, or an attitude of 149 089 and 344.

CAPCOM We copy.

ENDEAVOUR Guess you better run that one through the mill down there again.

CAPCOM We're chewing on it. Al, you may be interested to know that the Rover has crossed quite a bit of territory now, and they're on the edge of the rille having a good look into it.

ENDEAVOUR Very good. Things seems to be working Okay.

CAPCOM Roger. They'll be at Elbow corner Crater in just a couple of minutes.

CAPCOM Endeavour, you can give us AUTO on the high gain. And Al, Vance is sitting beside me here, he's been downstairs talking to the PI's about the pan camera and has some good words for you.

ENDEAVOUR Okay, go ahead, Vince.

CAPCOM Hey, good morning, Al. First of all (garble) said to tell you that your -

ENDEAVOUR Good morning, Vince. Hey I'm looking at our favorite crater right now.

CAPCOM Is that right? Couldn't be King Crater.

ENDEAVOUR Yes sir. I'm right over Brocklin, Brocklin.

CAPCOM Okay. Very good. Hey (garble) has a message for you.

ENDEAVOUR Very good. How's (garble)

CAPCOM He's good. He says to tell you that you make a dandy spectrographer for X-rays that is. He's getting a lot of data in. I guess actually a little more activity that they expected and they seemed real pleased about that.

ENDEAVOUR That's good they ought to keep Pete and Jack busy.

CAPCOM Getting into the pan camera. I don't know how much has been explained to you. It's taking pictures, about 80 percent of them are good and the problems in V over H sensor, which I'll try to explain here briefly The V over H sensor is drifting, which means that occasionally it drifts down to the place where it thinks your out of the 45 to 80 mile limit. Whenever it does that why the camera is commanded back to a nominal 60 setting. As it turns out it drifts enough it's out of this band most of the time and that's actually good because your at

CAPCOM 60 miles so it's going back to the 60 mile limit probably to give you 80 percent of the time good pictures. The fault, we're not quite sure where it is, people are working on that. It's probably either in the sensor or upstream just a little ways in the electronics.

ENDEAVOUR Roger, Vance. I understand.

CAPCOM Other than that, Al, I haven't got much to report to you. Data seems to be coming in on all the experiments, that's looking pretty good.

ENDEAVOUR Yes, I noticed just some problems with getting the booms in and out, Vance, but outside of that everything seems to be okay. The (garble) camera is taking about 4 1/2 minutes to retrack now and I had a little trouble getting the mass spec in the last time and I ran it out and in a couple of times before it finally came all the way in.

CAPCOM Roger. AUTO on the high gain.

ENDEAVOUR Roger, AUTO.

END OF TAPE

ENDEAVOUR (Garble).

CAPCOM And Al, the next time you extend and retract the boom, they'd like a hack on it, and on the mapping camera too because I'm sorry they'd like a time hack when you start extending the mapping camera and what it gets out. They're looking at the current signatures and that sort of thing on it.

ENDEAVOUR Okay, they want to help me keep time, do they.

CAPCOM We're just looking at the real time electrical signatures when this thing is working extending and retracking, Al. And we'd like to have a hack so we will know when you - when we can start looking.

ENDEAVOUR Okay, I understand, now. Your watching the voltage levels or power levels in the motor that drives the extender.

CAPCOM That affirm.

ENDEAVOUR Okay.

CAPCOM Okay, back to call.

ENDEAVOUR Okay, man.

ENDEAVOUR Houston, Endeavour.

CAPCOM Endeavour, go ahead.

ENDEAVOUR Okay, Karl. This may be the wrong attitude for we want, but it's such good viewing attitude that, let me make a couple observations while we're here.

CAPCOM Great, we're listening.

ENDEAVOUR Okay, I'm right directly over Littrow at the present time and I can see all the way around to the Apennine front encompassing all of Serenitalis between here and there except to the north over by Posidonius. So I got a very good view of Sulpicius Gallus and that sort of extends off like 10, 11, to 12 o'clock position. And the observation I wanted to make in particular, was the distinct way that the rilles do follow the old mare basin. The fact that the second color band that we discussed in Littrow seems to be continuous right on across the basin into Tranquillitatis and on around almost a shelf, a continental shelf appearance, on into the Sulpicius Gallus and that seems to be that second color band that we noticed in Littrow. There is a darker color - coloring in the uplands in Littrow and closer to the front or closer to the basin of Scarp. But the second band seems to go all the way around (garble) and then as you follow (garble) on around a little bit more to the west, that color banding's still there, I can see a distinct boundary between it and Serenitalis basin itself, inner basin, but it turned into a little more brownish color from the grey color that we saw before.

CAPCOM Roger, Al. You're coming through loud and clear.

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 122:13 CDT 10:47 CM31/2

ENDEAVOUR Houston, Endeavour. Karl I've got Hadley Rille in place now in front and I have a very commanding view of the whole countryside.

CAPCOM Beautiful. Any chance of spotting rover tracks down there, do you think?

ENDEAVOUR Well, I got the binocular out and I'll let you know.

END OF TAPE

CAPCOM Al, you're getting a beautiful view from up above, we just got some beautiful pan shots of Hadleys Rille and so also of blocks and bed rocks sticking out of the rim of it.

ENDEAVOUR Rog, Karl, I can vouch for the rocks and the blocks in the bed rock in the Rille. I can see it from here with a binocular. Didn't have much luck picking up the rover. I think I got a look at the LM again through the binocular, but I wasn't real sure.

CAPCOM Very good.

CAPCOM You must be just about over the area south of Archimedes there with all those simulous and linear rilles that's pretty choppy country, isn't it?

ENDEAVOUR Yeah, that's primitive. That's right where I'm at now, just south of Archimedes and hummocky, hilly terrain south of Archimedes is, in fact, quite full of rilles, although they're very subdued rilles, they don't have much definition to them, even in the low sun angle. But they're combinations of linear rilles, which seem to run North, West, South, East and sinuous rilles, which have no particular direction. Then I noticed a couple of rilles have, in fact I'm looking at one right now, you should see a small crater pair just to the left of Archimedes and a real light feature running to the East out of it. And, that rille feature has a series in a whole succession of craters running right down the rille.

CAPCOM Right down the rille. Any sort of blankets a round these craters? Does it look like volcanic chain there coming out of the rille?

ENDEAVOUR Well, it certainly looks like a volcanic chain. Let me check and see if I can see any (garble).

ENDEAVOUR No I don't see any rim deposits associated with them. In fact, the craters that I'm looking at are irregular in shape elongate, in direction of the rille and they look distinctly like collapsed features in (garble).

CAPCOM Very interesting.

ENDEAVOUR They did'nt seem to have any particular shape except that they were elongate in the direction of the rille and I did'n notice any particular, any build up around the mountain. In fact, in this particular sun angle, which is rather low, I didn't really see much elevation around them. So I assume that they're depressional, kind of collapsed features, rather than build up features actually.

CAPCOM Roger.

CAPCOM Okay, Al. Mapping camera comes OFF in about 30 seconds.

ENDEAVOUR Okay, Karl.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/31/71, 11:07 CDT, 122:33 GET, CM33/1

CAPCOM Al, whenever you're ready, I've got a couple of photo pads for you.

ENDEAVOUR Okay, Karl. I've got all the camera setups for the solar corona. And they're all checked out and ready to go so I'll stand by for your pad.

CAPCOM Beautiful. Over on the next page at 123 hours and 16 minutes solar corona. The time is 123:16:50. And down there at 123:50 the uv photo pad, 123:49:49.

ENDEAVOUR Okay, Karl. Understand. The solar corona pad is 123:16:50 and the uv is 123:49:49.

CAPCOM That's correct.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 142:44 CST 11:18 CM 34/1

CAPCOM A, Houston, Endeavour.

ENDEAVOUR Endeavour, Go ahead.

CAPCOM Roger. If you are ready down there, I'll go ahead and retrack the mapping camera now. If you want to watch the data.

ENDEAVOUR Standby a second.

CAPCOM Okay, I'm waiting.

ENDEAVOUR Okay. You are go to retrack the mapping camera and give it the mark.

CAPCOM Okay. On my mark. MARK.

ENDEAVOUR Okay, Houston mark. Talkback is great.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/31/71, 11:28 CDT, 122:54 GET, CM35/1

CAPCOM Al, this is Houston. I hate to start bothering you right when business is getting heavy here, but we find that waste water is accumulating faster than we anticipated and in order to avoid a waste water dump before we planned it, we'd like to have you fill up a water bag. Looking at your current schedule, we recommend you start that right away and get it done.

ENDEAVOUR Roger, Houston.

CAPCOM And Al, that is on page C2-28 for waste water.

ENDEAVOUR Roger, Karl, Thank you.

CAPCOM They say it will take about 8 minutes to fill a bag.

ENDEAVOUR Houston, Endeavour.

CAPCOM Go ahead, Endeavour.

ENDEAVOUR Okay, Karl. Say again the page number, please.

CAPCOM The page number is C2-28 and the bag is down in the L-shaped bag they tell me.

ENDEAVOUR Roger. I've got the bag out.

CAPCOM And before you go around the corner, I should tell you that the configure DSE should be done at 123:10.

CAPCOM And a reminder that that is a low bit rate command this time.

ENDEAVOUR Roger.

CAPCOM Okay, Al. We have one minute to LOS. All systems are looking good and enjoy that solar corona.

ENDEAVOUR Roger. Thank you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/31/71, 12:29 CDT, 123:55 GET, CM36/1

CAPCOM Endeavour, this is Houston. How do you read?
CAPCOM Endeavour, this is Houston. How do you read?
ENDEAVOUR Hello, Houston. Endeavour. Did you call?
CAPCOM Roger, Endeavour. We copy you. A bit noisy yet. On the second set of uv photos at T start plus 7 minutes a number that we have for you is 56 minutes and 49 seconds if you haven't already computed it.
ENDEAVOUR Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 124:00 CDT 12:34 CM37/1

CAPCOM Endeavour, we'd like to have OMNI ALPHA.
ENDEAVOUR Roger. OMNI ALPHA. And Houston, Endeavour.
CAPCOM Go ahead, Endeavour.
ENDEAVOUR Houston, Endeavour, how do you read now?
CAPCOM Go ahead, Endeavour.
CAPCOM We're reading you loud and clear.
ENDEAVOUR Okay, Carl. Okay, inbetween taking pictures here, I've been trying to collect this stuff for the waste water dump or for the waste water collection. I got the bag out, but I'm having trouble finding that female QD. Do you know where it is?
CAPCOM Standby. But in the meantime, we'd like to verify that in NOUN 79 we got 5 degrees.
ENDEAVOUR Stands affirmative.
CAPCOM Thank you.
CAPCOM OMNI BRAVO on the way to high gain.
ENDEAVOUR Rog. OMNI BRAVO.
CAPCOM And Al, I have the solar corona start time any time you're able to copy.
ENDEAVOUR Okay, go ahead.
ENDEAVOUR Go ahead with the T start time.
CAPCOM Roger. T start is 124 32 22.
ENDEAVOUR 124 32 22.
CAPCOM That's correct.

END OF TAPE

CAPCOM Al, you may be interested to know that the fellows on the surface have completed a very successful EVA I and are back on the LM at the present time.

ENDEAVOUR Very Good. EVA I finished, huh?

CAPCOM Except for the ALSEP part of it.

CAPCOM Al, the best information we have on that female QD fitting is that it would be in the waste management system backup bag and A8.

ENDEAVOUR Okay. I'll look some more.

CAPCOM Al, we seem to be at the right altitude and we can bring up the high gain if you'd give us a pitch minus 45 and yaw208.

ENDEAVOUR Okay. Minus 45 208.

CAPCOM Al, this is Houston. A, about that filling up the water bag, unless you're under way with it already, our basic priority here is to go ahead and get configured for the solar-corona shots; and you can forget the water unless you're already into it.

ENDEAVOUR Roger. I've got everything, I think I'll do now except I still can't find the female QD.

CAPCOM Okay. I would say let's worry about that later.

CAPCOM And the word is that we'll just go ahead with the normal dump on the backside as it's scheduled in the Flight Plan.

ENDEAVOUR Okay. That sounds good to me.

END OF TAPE

CAPCOM Al, is there any useful comment on the condition of window 5?

ENDEAVOUR I don't think so, Karl, other than the fact that it looks very clear. There aren't - it's not smudged or anything right now.

CAPCOM Very good.

ENDEAVOUR Infact, window 5 is in - certainly in better shape than window 1.

CAPCOM I see.

ENDEAVOUR There are a bunch of little specks or spots all over the outside of it. It looks like dust that's collected there. Window 5 is almost clear.

CAPCOM I see. The uv people are lucky then. Very good.

ENDEAVOUR Houston, Endeavour.

CAPCOM Go ahead, Endeavour.

ENDEAVOUR Okay. Just went over the landing site and grabbed the binocular to take a look and saw a gleam of light off the LM again and it's the same location that I called out before.

CAPCOM Beautiful.

END OF TAPE

APOLLO 15, MISSION COMMENTARY, 7/31/71, CDT 1:04, GET 124:30 CM40/1

CAPCOM Al, the Solar Corona photography should start in about one minute.
ENDEAVOUR Rog, Carl. Be right with you. Count down 45 seconds.
CAPCOM Roger.
ENDEAVOUR Incidentally, you could probably call (garble) count down (garble).
CAPCOM Okay.
ENDEAVOUR Might try it anyway.
CAPCOM Roger. There we see it going.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 114 CDT 124:40 GET CM-41/1

CAPCOM Al, Let me have the high gain antenna, Auto.
ENDEAVOUR Roger, Auto. And I'm maneuvering from the next one.
CAPCOM Roger.

END OF TAPE

CAPCOM Endeavour, this is Houston. How do you read?

CAPCOM Endeavour, this is Houston. How do you read?

CAPCOM Endeavour, this is Houston. How do you read?

ENDEAVOUR Okay, Houston. Looks like we're just going over the hill here. Just wanted you to know it looks like my mission timer on the main panel is shot.

CAPCOM Roger, Al. We read and we would like to have command reset and low bit rate.

ENDEAVOUR Roger. Reset to low bit rate.

CAPCOM Probably - -

ENDEAVOUR The timer is - It - The mission timer stopped at 124:47:37.

CAPCOM Roger. This is the - -

ENDEAVOUR I've reset it for 124:59.

CAPCOM This is the one on panel 1, is it? Or the mission timer, huh?

ENDEAVOUR That's affirm.

CAPCOM Is that DET in - -

ENDEAVOUR That's right.

CAPCOM Roger.

ENDEAVOUR No. The DET is over on the left side.

CAPCOM Roger. You mean the main mission timer over on panel two then.

ENDEAVOUR That's affirm. Mission timer on panel two.

CAPCOM Got you.

CAPCOM All systems are looking good, Al. See you on the other side.

END OF TAPE

CAPCOM 15, this is Houston. We'd like to have you go wide beam on the high gain antenna, and then to narrow.

ENDEAVOUR Okay, Houston. This is Endeavour. On wide beam, going back to narrow.

CAPCOM Roger.

CAPCOM That's sounding better, Al. How're things going up there?

ENDEAVOUR They're going okay, Karl. Looks like I caught up a little bit. Got all the dumps out of the way and got the libration photography. Looks like I'm going to be handicapped a little bit because of the mission timer but we'll press on.

CAPCOM All right. Our understanding on the mission timer is, that even though you tried to reset it, it still refused to count up, is that correct?

ENDEAVOUR That's correct and I thought that what I'd do now is reset to zero and start.

CAPCOM Roger. And for future reference, we'd like -

ENDEAVOUR It counts from zero, Karl, right?

CAPCOM Rog - you say it is counting but it had to start from zero to start counting again?

ENDEAVOUR Yeh, well let me pick a random number and see if it will count from there. I just tried to set in the correct time. Okay, Houston, Endeavour. Looks like we must have just run across a little funny there, Carl, because it started okay now and is right.

CAPCOM Roger. Do you have a time source or would you like a hack down here to get it started again, on the right number?

ENDEAVOUR I used the CMC time.

CAPCOM Roger. And now for future reference, we'd like to know if you found the quick disconnect?

ENDEAVOUR Negative.

CAPCOM We copy. Al, they want me to ask you once more about - tell you once more where the location was. The waste management bag in A8, but I think you know that already. Incidentally, it's a rather short thing, 2 or 3 inches long, it's got a thread on one end and the quick disconnect on the other.

ENDEAVOUR Yeh, Carl, that's exactly what I was looking for and problem is the waste - the small waste management bag's not in A8 right now. I may have to look around. Maybe Dave or Jim got it out on the way out. I'll look around and see if I can find it.

CAPCOM Okay, fine.

ENDEAVOUR I just haven't had a free minute since they came up to do that.

CAPCOM Right. And there's no reason now to be troubled by it at all. We were just asking that for future reference. Sounds like it's only a matter of it being misplaced somewhere, so let's forget it.

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 125:51 CDT 2:24 CM43/2

CAPCOM Endeavour, we'd like to have high gain antenna AUTO.

ENDEAVOUR Okay, Houston, Endeavour. You've got high gain AUTO and I've got the pan camera power ON.

CAPCOM Very good. Any time on this rev, we'd like to have an update on the magazines and in the meantime let me give you a few good words on the surface activity. The boys have spent the last hour deploying the ALSEP and I think all the experiments got out except we had some trouble, as anticipated with the drill. Dick Gordon is down here saying I told you so. The - Dave was in the process of making the world discus record when he just about fell flat on his face he threw it so hard. That was the high spot of the whole ALSEP deployment procedure.

ENDEAVOUR How far did he get it?

CAPCOM Oh, I suppose we'll claim something like 2 or 3 kilometers. Who knows for sure (laughter). But the gyrations he went through to keep his footing after that big heave -

ENDEAVOUR Better than golf balls.

CAPCOM Yeh, yeh. It was really funny to see him scrambling to keep his footing though after he swung around.

CAPCOM Okay, Al, we're ready to have the pan camera power OFF.

END OF TAPE

APOLLO 15, MISSION COMMENTARY, 7/31/71 CDT 2:34 GET 126:01 CM44/1

CAPCOM Endeavour, this is Houston. You can turn pan camera power OFF, now.

ENDEAVOUR Roger, Houston. Got it off.

ENDEAVOUR Houston, Endeavour.

CAPCOM Go ahead Endeavour.

CAPCOM Endeavour, this is Houston. Go ahead.

ENDEAVOUR Okay, Karl. Just for your information, I finally ducked all the way through 88 and got a hold of quick disconnect, as I expected it. But, it was there, and we squared away now.

CAPCOM Very good, that makes people feel better down here. We did spill it after all.

ENDEAVOUR Yeah, well, one of my problems is that I got the center couch underneath the right-hand couch, and I've also got the L-shaped bag and a few other things stowed on top of 88, so, it's not so easy to get to.

CAPCOM Right on. We understand.

END OF TAPE

CAPCOM Al, the boys are in the LM and they're repressurizing the cabin now.

ENDEAVOUR Roger, Karl. Sounds like they had a pretty good day.

CAPCOM Yes, sir. They had a terific day. I think they're going to sleep well tonight.

ENDEAVOUR Yes. I wouldn't be surprised.

CAPCOM Endeavour, this is Houston. You getting a good look at Littrow up there?

ENDEAVOUR Yes, sir. Just went by Littrow and right over Serenitatis coming up on the landing site.

CAPCOM Very good. Hey, you been looking the Littrow for a couple of days now. Are you forming any opinions whether that dark area is lava flow of ash flow?

ENDEAVOUR Well, Karl, if I had to give you the opinion right now, I'd say it was all some kind of ash. I'm not sure it's flow. But it certainly is - It looks like a deposit over the entire surface. You can see it mostly in the upland areas and down in the mare areas and mostly in valleys and depressions this stuff seems to have collected almost like it was - there was some mass wasting down the hill making the valleys darker in color and maybe a little thicker with that kind of material. But there still at least three different distinctive colorations in the Littrow area, going from dark gray to a sort of brownish color. And it was the dark gray that looked like it was an ash fault to me and I'm not sure about the intermediate. It looks more like it could have been a flow and I can see even through the binocular I can see the contact where if there's a - it looks like a flow front between that and the mare - the normal mare coloration which is a little lighter in color.

CAPCOM Okay. I guess we better let you go back to work on Hadley which is coming up any minute now.

ENDEAVOUR Roger.

END OF TAPE

ENDEAVOUR Houston, Endeavour.
CAPCOM Go ahead, Al.
ENDEAVOUR Okay, Carl. I'm over the Hadley area now I've gone by it and nothing more to report on the Hadley except one observation that I meant to make on the last pass and didn't, I'll make it now. That is that the land mark 15 dash 40 is readily visible even with the negade eye. You don't need a sexton to see it.
CAPCOM Very good. Does that secondary crater complex stand out in any special way that gives you some idea to its origin?
ENDEAVOUR No. I didn't look at it from that stand point where I was going over it before, but I guess I'll have to take a special look at that to answer your question.

END OF TAPE

CAPCOM Hey Al, how's that sunset look down below you?

ENDEAVOUR Well, I can't see it from here Karl.

CAPCOM Any chance you have got light in the Aristarchus area yet? Seeing anything down there?

ENDEAVOUR Negative, Karl. I'm beyond it; and it looks like I'm looking in the wrong direction anyway. I will say this though. There is, there seems to be a cloud that seems to be moving along with me. I guess from that last dump, and it's drifted out, pretty well dispersed right now, but every little particle of that cloud reflects the sunlight like a mirror.

CAPCOM That's a very interesting observation. Do you still see some of it out there now, do you?

ENDEAVOUR Yeah. That's affirmative. I do; and I dim the lights down and I have a pretty nice view of the Moon and Earth set.

CAPCOM Ah hah. Any chance you see Aristarchus? Are you, maybe you're not looking that way, I guess. Are you looking down on Aristarchus by any chance?

ENDEAVOUR Well, just a second and I'll turn the lights down and let you know.

CAPCOM Good. That's Schroter's Valley, you know, and it's known to glow red.

ENDEAVOUR Hello Houston, Endeavour.

CAPCOM Did you call, Al?

ENDEAVOUR Roger, Karl. I've been sitting here looking at Aristarchus, and I finally had to check the map to make sure; because it is so bright in Earth shine. It's almost as bright, it seems like as it is in sunshine. Very, very bright crater. It looks very much like Copernicus, I think.

CAPCOM I'll be darn. Sounds real interesting.

ENDEAVOUR Yeah. And I can quite clearly trace out Schroter's Valley going off toward the Northwest. But I can't see it. It's a little bit out of range; it's North of tracks and so it's somewhat out of range for me to see.

CAPCOM Very good.

CAPCOM Hey. Spence is asking me to remind you about the film magazine update if you have any time yet this rev.

ENDEAVOUR Okay. I'm going to have to go back through the Flight Plan and get the numbers out. But I will do that.

CAPCOM Okay. A, I'm not sure we want you to do that at the expense of anything else here would like Po B52; hang on.

ENDEAVOUR So I'll go ahead and do the P52, Karl.

CAPCOM Right. We'd rather have you do the P52 if there is any either/or there.

END OF TAPE

CAPCOM We've got your torquing angles, Al.
ENDEAVOUR Okay, Karl, get them out in a minute.
CAPCOM Hey Al, you've got a couple of people interested, down here in particle clouds now. And, first of all we'd like to have you verify that you saw particles all the way until you went into the shadow. I certainly believe you did. You were telling me about them just as you were in that position. And likewise, if you have a chance at sunrise tomorrow when you are in that same position, with the sun illuminating you, but not the back-ground could you see if there is any remaining signs of those particles?
ENDEAVOUR Okay, be glad to. As far as how long I saw them, I saw them as long as the spacecraft was still in sunlight. However, I was beyond the terminator, surface terminator. And, right now, looking out the window I don't see any of them.
CAPCOM Okay, fair enough. And I got some words for you on that attitude we had on the oblique mapping camera photography this morning. If,-
ENDEAVOUR Okay.
CAPCOM Incidentally, we sent you up the right attitude angles, but some how or other we had a slightly erroneous omicron. And, the actual photograph, I think we were something like 10 or 15 degrees off attitude. We're perfectly good. No problem there. But, we have gone to the flight plan and make sure in the future that we will have the proper omicron and everything will be right on the nose.
ENDEAVOUR Okay.
CAPCOM Just in case you wondering what in the heck went wrong that time. I have a TEI 37 any time you have time to copy it.
ENDEAVOUR Okay, just a minute.
ENDEAVOUR Okay, Karl. Go ahead with the TEI 37.
CAPCOM Say it again Al.
ENDEAVOUR Go ahead with your TEI 37 pad.
CAPCOM Roger. TEI 37, SPS G&N 37 35 0 plus 0 6 0 plus 1 0 1 151 00 1743 plus 297 91 minus 0 7 4 5 2 minus 0 2 4 3 3 1 8 0 1 0 9 3 4 9 the rest is NA. (Garble) 2 jets for 17 seconds 17 seconds and the longitude at TIG is minus 179.52. That's all.
ENDEAVOUR Okay, understand TEI 37, SPS G and N 3 7350 plus 060 plus 1 0 1 15 1 00 1 7 4 3 plus 2 9 7 9 1 minus 0 7 4 5 2 minus 0 2 4 3 3 18 0 1 0 9 3 4 9, 2 jets 17 seconds, longitude TIG is minus 179.52.
CAPCOM That's all correct.

END OF TAPE

CAPCOM Al, how is your exercise machine going up there. Getting all you need for the big day in the future.

ENDEAVOUR Right now I'm trying to figure out your belt usage.

CAPCOM Oh, ho.

ENDEAVOUR Yes, the exerciser is working fine. The ropes getting a little frayed right now.

CAPCOM You're really putting in all your hours on it, are you? Glad to hear that.

ENDEAVOUR Got to keep in shape.

CAPCOM Righto.

ENDEAVOUR You might also be interested to know that at least up to this point we've eaten every morsel of food that was alloted for us at that time.

CAPCOM Sounds like you're really living it up up there.

CAPCOM Chuck Berry says he's delighted.

ENDEAVOUR Houston, Endeavour.

CAPCOM Go ahead, Endeavour.

ENDEAVOUR Okay. I got a quick rundown on the film for you. The DAC magazine hotel is at 65 percent left and for the Hasselblad mag metro is - I've used 155 frames November used 56 frames, Romeo's used 40 frames, Sugar used 80 frames and Nikon I've used 16 frames. And let me reverse the first one just to make it consistent. I've used 35 percent out of mag Hotel for the 16 millimeter. That makes it all consistent.

CAPCOM Very good, Al. That came through loud and clear.

CAPCOM Al, everybody down here is sending up bouquets to you for having done such a great job in a crowded period.

ENDEAVOUR Well, thank you very much, sir.

CAPCOM And all the systems down here are looking in good shape as you go around the corner.

ENDEAVOUR Okay, Karl. Thank you.

ENDEAVOUR I think I'll get something to eat.

END OF TAPE

CAPCOM Endeavour. We'd like to have a narrow beam. Please.
ENDEAVOUR Narrow beam.
CAPCOM Thank you. And what's new on the west limb of the moon?
ENDEAVOUR Well I must confess I wasn't watching. I was eating.
CAPCOM Enjoy. Looking at the flight plan, looks like you finally had a restful sort of eat period.
ENDEAVOUR That's true and it certainly was good. Incidentially, I did look for the partical cloud that was around me at sun rise and It looked like it had diminished some what from the sun rise or from the sunset terminator, But it may have been the angle of the sunlight also.
CAPCOM But you definately did see some particals yet?
ENDEAVOUR Fewer particals.
CAPCOM Fewer particals, but still some were there were they?
ENDEAVOUR That's correct.
CAPCOM And how do you enjoy that cokena soup?
ENDEAVOUR Almost as good as the parsley soup.
CAPCOM Wonderful. Brued it myself.
ENDEAVOUR It's better than nothing, you know?
CAPCOM Is that all you can say for it?

END OF TAPE

ENDEAVOUR Understand. 14:14.
CAPCOM Roger.
CAPCOM And Bob is onboard now so I'll be signing off and seeing you in the morning.
ENDEAVOUR Okay, Karl. Go home and have a nice dinner and I'll talk to you in the morning.
CAPCOM Righto.
CAPCOM And Al, it's your computer.
ENDEAVOUR All righty. Good morning.
CAPCOM Evening.
ENDEAVOUR Houston, Endeavour.
CAPCOM Go ahead, Endeavour.
ENDEAVOUR Okay, Bob. I'm just coming over Picard at the present time and wanted to make a comment that it looks like there are several ring structures inside the basin itself. They're all concentric and I don't see a great deal of relief on those that look they're in the bottom of the basin but looking at the scarps around the outer ring, Picard looks like it's just almost caldera type. They look almost like fault plains along the outside. And I can see in the outer wall very distinct layering. For instance, the top - right at the top is a very thin dark layer and that runs all the way around and there's a light card layer and then there are alternating dark and light layers all in about the same distance from the top of the crater all the way around.
CAPCOM Roger. Copy, Al. That sounds like a pretty good description.
ENDEAVOUR And as a matter of fact, Bob, I can make that same observation about Pierce, especially Pierce Alpha. This - I notice the same kind of layering and the same kind of horizontal litiments in the wall of the crater.
CAPCOM Beautiful. The King will be proud of you.
ENDEAVOUR Houston, Endeavour.
CAPCOM Go.
ENDEAVOUR Okay, Bob. I'm up over Proclus now and that's one of the visual targets. And a couple of comments about Proclus which weren't too obvious from the pictures we've seen before. The edge or the segment of the crater which is in the excluded zone of the ray pattern which the ray pattern by the way is very distinct even from directly overhead. That little segment of the crater wall seems to be discontinuous with the rest of the crater. In other words, the crater if you made a circular ring and you showed that as the crater, then this little chunk in that quarter where the excluded zone is lies outside of what you would describe as a circle for the crater itself. It's like a little dimple in the crater itself. And I can't see anything in particular there close to the rim that would account for any shadowing -

ENDEAVOUR any physical shadowing of the ray pattern. But I can see a diagonal fault zone that runs down into that little dimple that I just described a minute ago and runs into that dimple from the east side. I couldn't pick one out on the west side but it's very distinct on the east side.

CAPCOM Beautiful.

ENDEAVOUR And in addition to that, I didn't see - I didn't see a great deal of difference in the - -

END OF TAPE

ENDEAVOUR Houston, Endeavour.

CAPCOM Go ahead.

ENDEAVOUR Okay. I'm looking right down on Litro now and a very interesting thing. I see the whole area around Litro, particularly in the area of Litro where we've noticed the darker deposits there are a whole series of small, almost irregular shaped cones and they have a very distinct dark mantaling just around those cones. It looks like a whole field of small sinder cones down there and they look, well I say sinder cones because there're somewhat irregular in shape their not all, their not all round their positive features and they have a very dark halo, which is mostly symmetric but not always around them individually.

CAPCOM Beautiful, Al. And Al, you might want to be reminded at this point, we're getting towards the VHF.

ENDEAVOUR Right Bob. Was just going to give them a call.

ENDEAVOUR Hello Falcon this is Endeavour.

ENDEAVOUR Hello Falcon, Endeavour.

ENDEAVOUR Hello Falcon, Endeavour.

FALCON Hello there, Falcon. How you doing?

ENDEAVOUR Hey going real fine, Dave. We're just doing the photography bit and doing a few visual observations and I've taken a look at you a couple of times down there. How's it going there?

FLACON Yes, I am. The rille is just coming into sight now. Well I looked for it before, but couldn't see him, while I got some binoculars.

ENDEAVOUR Very good, very good. I understand it was a very successful EVA.

FALCON Yes it appears that they're getting some pretty good stuff.

ENDEAVOUR Sure is. I hope that it is.

FALCON Okay.

ENDEAVOUR Are you finished for the days activities now? Very good. Get a good night sleep.

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 128:20 CDT 16:54 CM53/1

ENDEAVOUR Very good. Get a good night's sleep. Oh, I'm living the Life of Riley up here now. Very comfortably. I won't Jim, I'll save room for you. Save you some food? I'm not sure there'll be any left. I have a well stocked pantry here. Well, Davey, I think I got you on the nonocular. No, I can't see your tracks, Jim, but I can see discoloration, rather circular, looks like it's around the LM. Is it over east of you? No, I don't have it. Yeh, all I've got is the nonocular. Okay, get to work and I'll talk to you tomorrow.

ENDEAVOUR Houston, Endeavour. Mapping camera is going to extend now.

CAPCOM And Endeavour, we'd like AUTO on high gain please.

ENDEAVOUR Roger, Houston. Going AUTO.

ENDEAVOUR Houston, the mapping camera talk back is great.

CAPCOM That's copy. Thank you. And, Al, we have a mapping camera photo pad for you, when you're ready to copy.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 128:28 CST 11:03 CM 54/1

CAPCOM And Al, we have a mapping camera photo pad for you when you are ready to copy.

ENDEAVOUR Roger Bob. Go ahead.

CAPCOM Okay. T Start; 1292652; T Stop; 1302630; and it says note at T Start; Map Camera image motion increase. Talk back barber pole plus 4. And at 13008 mapping camera image motion increase. Talk back barber pole. Over.

ENDEAVOUR Roger. Understand mapping camera photo pad. T Start 1292652; T Shop 1302630; and at T Start you want the image motion increased to barber pole plus 4; and at 13008 you want image motion increased to barber pole.

CAPCOM Roger.

END OF TAPE

CAPCOM Endeavour Houston. We can terminate that B charge at this time please.

ENDEAVOUR Roger, Houston. Will do.

CAPCOM And Endeavour, Houston. We're 4 minutes to LOS. A couple of comments before you go around the corner. First, the surgeon thinks you may have loosened part of your EKG Harness while you were exercising. Like you to check that at your convenience. Second, we have a new GAMMA RAY retract time on the back side of 1 29 2 0. Over.

ENDEAVOUR Roger, Houston. I understand going around the back side. I'll check up on the Bio Med Harness. I may have loosened it exercising and understand you want the GAMMA RAY BOOM retracted at 1 2 9 2 0.

CAPCOM Roger. We won't be able to see it to keep track of the times, remember Al. And also I guess the mass spec people would appreciate any more comments you can think of. Next time you take a look at those particles at sunrise. Over.

ENDEAVOUR Okay, Bob. Will do.

ENDEAVOUR Houston, Endeavour. One last comment.

CAPCOM Go.

ENDEAVOUR Okay. When I the battery b off charge and checked the systems test meter for battery pressure, battery compartment pressure and it was, systems test meter read 1.4, which is, looks like it's getting pretty close. Is that test meter still working all right.

CAPCOM Roger, standby. We're looking at that.

ENDEAVOUR Okay.

CAPCOM Okay. that's, they say that's nominal That looks good.

ENDEAVOUR Okay. Thank you.

CAPCOM Okay, Al, if you read, we'd like to have DSE configured.

END OF TAPE

CAPCOM Endeavour, Houston. We'd like REACT and NARROW if you can and we have good biomed data.

ENDEAVOUR Houston, Endeavour. How do you read?

CAPCOM Loud and clear.

ENDEAVOUR Okay. Reading you loud and clear also.

CAPCOM Endeavour, we have a small series of updates here if you're ready to copy.

ENDEAVOUR Stand by one.

ENDEAVOUR Okay, Houston. Endeavour. Go ahead with your updates.

CAPCOM Okay. First one is a change to your erasable load printed in the G&C checklist. This change has already been made in the computer. It's on page 9-4 and I'll wait for you on that one.

ENDEAVOUR Okay. Stand by.

ENDEAVOUR Okay, Bob. I'm there.

CAPCOM Okay. And on column Delta, line 05, we will change that number from 01571 to 01605. Over.

ENDEAVOUR Understand. That's column Delta and (garbled) 05, change to 01605.

CAPCOM That's verified.

CAPCOM And all the next updates here are in the flight plan.

ENDEAVOUR Okay.

ENDEAVOUR Okay. Go ahead.

CAPCOM Okay. At - these are changes to the bistatic radar at 130:52 P00 at pitch 177 degrees. And we're deleting the P00 at pitch 171 at 130:54 there.

ENDEAVOUR Okay. And what time do you want that. At 130:52?

CAPCOM That's affirm.

CAPCOM And at 131: - -

ENDEAVOUR Okay.

CAPCOM At 131:10 we will change the VERB 49 maneuver to bistatic attitude from 06717100 to 06717700. So the pitch changes to 177. Over.

ENDEAVOUR Roger. Understand. Change the pitch to 177.

CAPCOM Okay. At 131:32 we're going to change the NOUN 78 values. We're going to change R2 to plus 06700. That's R2.

ENDEAVOUR Okay. Understand. Change R2 from 04750 to 06700.

CAPCOM Roger. And at 131:39 the start auto pitch rate attitude there will be the same as the VERB 49 inertial attitude updated at 131:10 which means we'll change that to - from 171 on the inertial to 177. Over.

ENDEAVOUR Roger. Understand.

APOLLO 15 MISSION COMMENTARY, 7/31/71, 18:18 CDT, 129:44 GET, CM56/2

CAPCOM Okay. And I have a camera photo pad for you. Pan camera. go to T start at - -
ENDEAVOUR Okay. Go ahead.
CAPCOM T start 130:18:05, T stop 130:19:16. Over.
ENDEAVOUR Understand. Pan camera photo pad T start 130:18:05, T stop 130:19:16.
CAPCOM Roger. And I have a TEI-37 pad for you if you can find a copy of a pad.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 GET 129:54 CST 18:29 CM 57/1

ENDEAVOUR Understand Pan Camera Photo Pad T Start 1301805, T Stop 1301916.
CAPCOM Roger. I have a TEI 37 Path. Is there any change?
ENDEAVOUR Roger. Yes, there is a change.
CAPCOM Okay, Go ahead.s TEI-37 SPS GNN 37350 plus 060 plus 101. At noun 33 150 59 3008; noun 81 plus 29791 minus 07486 minus 02196 180 109 349; and the rest of the path is unchanged. Ollage to Jeck for 1 7 seconds; and other comments longitude at teag will be minus 179 decimal 22. Over.
ENDEAVOUR Roger. Understand TEI 37 path STS GNN 37350 plus 060 plus 101. 150 59 3008. plus 29791 minus 07486 minus 02196. 180 109 349. To Jett 17 seconds, and longitude teag is minus 17922.
CAPCOM Roger. Read back correct; and that's the end of the updates for the moment.
ENDEAVOUR All righty.
CAPCOM And Endeavour; we would like to get the call-out which was at 12950 for the Gamma Ray Game Set to shield off. Over.
ENDEAVOUR Roger, Understand.
CAPCOM And we, you, can get that most anytime soon. For 10 minutes; it is not critical yet I guess, as far as the Start Time is concerned.
ENDEAVOUR Houston, Endeavour.
CAPCOM Go ahead Endeavour.
ENDEAVOUR Okay, the Delta T on the Gamma Ray Boom Retrack was 3 plus 07.
CAPCOM And Endeavour, Houston. When you have a moment, high-gain in auto now.
ENDEAVOUR Okay. Going auto; and do you want the onboard readouts now Bob?
CAPCOM Yeah, we'll take them.
ENDEAVOUR Okay. Crew Status, better than most I guess. TRD was 23135. Battery C 37. Pyrabat A 37. Pyrabat B 37. RCS in order 71, 69, 70 71.
CAPCOM Okay. We copy all.
ENDEAVOUR Okay; and (garbled)cycle.
CAPCOM Copy.

END OF TAPE

CAPCOM Endeavour, Houston.
ENDEAVOUR Houston, Endeavour. Go ahead.
CAPCOM Rog. And the people down here are suggesting that on your presleep checklist, we omit the direct O2 to ON to the rest of your solo flight 'cause you aren't just breathing down the cabin that much and I guess it will save a little bit of oxygen and eliminate the possibility of cracking a relief valve there. So delete that section from your -
ENDEAVOUR Okay, Bob, that sounds good. I didn't notice Yeh, okay, I noticed last night I set it at 5.7 or it was very close to 6 and it didn't drop a bit during the day today.
CAPCOM Rog. I guess that's what we're noticing too.
ENDEAVOUR Incidentally, just going over the Littrow area again. I described the - what looked like some at least fumorolic vents, they look like small cinder cones to me and every time I look at them, they - that's firms up my impression more and more that they're volcanic cinders cones - also I noticed one rille and I'd like to try and get some pictures of it here before we get too far away from Littrow on the next - maybe tomorrow. Looks very distinctly like the roof or the top of the rille is collapsed in some places, and the rille is exposed in other places.
CAPCOM Rog. It'll make a few of us here pretty about that.
ENDEAVOUR Yeh, it might confirm some things about rilles. It's a little difficult to see whether it is in fact a collapsed feature in some - in those parts of the rille or whether it's something else that I'm seeing. It looks very much like portions of the rille have a collapsed roof. And in fact, what I was looking at, works it's way into what looks like one of the ridges. It was very ridgy to the north and then turned into a rille as it went south.
CAPCOM Roger. Copy. Keep talking like that, and we might end up going to Littrow sometime.
ENDEAVOUR (Laughter) Yeh.
CAPCOM And Al, already you've generated enough interest for people to ask if it's underneath you so the mapping camera might be getting it now.
ENDEAVOUR Yes, the mapping camera should be getting it.
CAPCOM Beautiful.
ENDEAVOUR I suspect the landing camera might not have enough detail to pick it up as well as we'd like although, I don't know, I can see it with the 10 power binocular with out any trouble.
CAPCOM Copy. And just so we don't forget it, we got about 3 minutes to T start for the pan camera.
ENDEAVOUR Rog. Right with you. Countdown 2:50 now.
CAPCOM Right on.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 7/31/71 1849 CDT 130:15 GET CM-59/1

ENDEAVOUR Okay Houston. I've done the mapping camera pass over Hadley Rille and you can let me know when the lens is (garble)

CAPCOM Roger. Go ahead. And Al, we verify the lens is (garble) You can turn the power on.

ENDEAVOUR Alright, thank you sir.

CAPCOM And Al, while you're getting ready for the mapping camera, if you'll let us, will get a E-memory dump.

ENDEAVOUR Okay, Bob, stand by one.

CAPCOM Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/31/71, 18:59 CDT, 130:25 GET, CM60/1

CAPCOM And, Al, we're noted from the laser. I guess Vance told you earlier it's kind of going down hill a little bit and we'd like to turn it off at this time. It's working about 50 percent. So we'd like to turn it off right now.

ENDEAVOUR Roger, Bob. Laser is coming off.

ENDEAVOUR And the mass spec boom is coming out.

CAPCOM Copy.

ENDEAVOUR Houston, Endeavour.

CAPCOM Say again, Endeavour.

ENDEAVOUR Okay, Bob. I've got some good accurate times for you on the boom extension.

CAPCOM Okay.

ENDEAVOUR Okay. It's from switch actuation to when the barberpole goes gray. And the Delta T for the mass spec was 2 minutes 39 seconds, 2 plus 39 and the Delta T for the gamma ray was 2 plus 41. 2 plus 41.

CAPCOM Copy. Thank you.

ENDEAVOUR Roger.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 7/31/71, CDT 19:20, GET 130:45,CM61/1

CAPCOM Endeavour, Houston. Over.
ENDEAVOUR Houston, Endeavour. Go ahead.
CAPCOM Roger. One small change to your Flight Plan. Reminder of the change that we made yesterday, as well, at 133 17. And the mass spec peoples now want discriminator and multiplier to low. You remember that?
ENDEAVOUR (garble).
ENDEAVOUR Roger, Bob. I've got it. It's showing in low at 133 17.
CAPCOM Roger. Just a reminder. And another reminder, when you get ready to go to sleep you can go to reaquire and narrow with plus 25 and 185 and then we won't disturb you when you come AOS LOS on the pass after next, when you should be all ready asleep.
ENDEAVOUR Roger. Understand. High gain angles are plus 25 and 185.
CAPCOM Roger. I think they're in your check list too, Al.
ENDEAVOUR They could be Bob. I looked for them last night and couldn't find them.
CAPCOM I figured as much.
ENDEAVOUR Roger. And incidentally, the Delta T on the mapping camera retract was 3 plus 1 5.
CAPCOM Copy.
CAPCOM And Endeavour as you go around the hill, good night.
ENDEAVOUR Okay, Bobby. Good night.

END OF TAPE

PAO This is Apollo Control - -
CAPCOM Endeavour, Houston. Over.
CAPCOM Endeavour, this is Houston. Over.
CAPCOM Hello, Endeavour. Endeavour, this is Houston. Over.
CAPCOM Hello, Endeavour. This is Houston. In the blind. If you read, go REACT and NARROW at angle from pitch plus 25, yaw 185. That's pitch plus 25 and yaw 185. Over.
ENDEAVOUR Hello, Houston. Endeavour. Go ahead.
CAPCOM Okay, Al. This is Houston. You're loud and clear now. We'd like to suggest going to the pre-sleep configuration before you bed down for the night there on the comm.
ENDEAVOUR Yes. Roger. Will do, Gordo.
CAPCOM Endeavour, Houston. Over.
ENDEAVOUR Yes, go ahead, Gordo.
CAPCOM Okay. If you've gone through the presleep checklist, we noticed a couple of things. The optics power should go off and also in your DAP load go to all ones in R1. And we'd like a call when you finally turn in, turn the voice mode off just before you do that please. Over.
ENDEAVOUR Yes. Okay, Gordo. Haven't been through the checklist yet.
CAPCOM Okay.

END OF TAPE

CAPCOM Endeavour, Houston. No need to acknowledge, but we need the mass spec discriminator to low as per an earlier update. Over.
ENDEAVOUR Houston, Endeavour.
CAPCOM Go ahead.
ENDEAVOUR Gordon is that mass spec discriminator low or multiplier low. I got an update about 5 hours ago. It was they said Multiplier low.
CAPCOM Okay. I guess the update was on discriminator actually they're both suppose to be low, Multiplier and discriminator, Al.
ENDEAVOUR Okay. I understand you want them both low.
CAPCOM That's affirmative.

END OF TAPE

CAPCOM Al Frado, it's looking like wake-up time.
CAPCOM Good morning Al. They tell me you'r sleeping very well right now; I'm sorry to wake you up.
CAPCOM Good morning, Al. On the Planet Earth August the first is creeping in upon us; and your bleery eyed - -- CapCom down here is standing by at your service.
ENDEAVOUR Hello, Houston, Evdeavour.
CAPCOM Hello Endeavour, Good morning. How are you doing?
ENDEAVOUR Well, other than being rudely awakened I'm doing fine Karl.
CAPCOM Hey, I'm sorry that I have to do that, Al. Sounded like you were sleeping good. Hey, as the first test; can you give us high-gain auto and give us accept for a State Victor?
ENDEAVOUR Okay Karl; you've got them both.
CAPCOM Thank you; and we've got about ten minutes till LOS at the present time. When you've got a pencil and a paper I'll give you a short Flight Plan update and a Camera Pad.
ENDEAVOUR Okay Karl, go ahead, I'm ready to copy.
CAPCOM Okay. On the Flight Plan update at 14103 they simply want you to add the report on the Gamma Ray and Mass Spec Boom Delta T's. And at 14104 there is a Lazer Altimiter ON which should be transferred down to 141 15. Those numbers come through okay?
ENDEAVOUR Karl, I got you. At 14103 you want me to report the Delta T's on the retract for the Boom; and move the Lazer Altimiter ON to 141 15.
CAPCOM Roger; and over at 14155 I guess we're having a look at Photo Target 25; and there is a friendly little note that goes with this. It says to be performed only if the CMP feels it won't interfere with his eating period. So, this is your choice. Do you want some numbers?
ENDEAVOUR Roger; let's have them.
CAPCOM Okay. Camera Configuration. CM/EL/250/CEX F5.61/250 infinity. 15 Frames. And at 142 04 the actual execute Photo Target 25 A 12, A 13-P 25. And it says CM with window 3 with the same Camera Configuration of 5 6. 1/250th at infinity; and 15 Frames at 10 second intervales.
ENDEAVOUR Right. And this is Magazine Q, pardon me. So much for the short Flight Plan update. Did a, does the photo target 25 stuff come through okay?
ENDEAVOUR I think I got most of it; but let me read it back to you just in case. Okay; at 141 55 we set up cameras for photo target 25 at CM/EL/250/CEX F5.6 1/250 at infinity. 15 Frames; and then at 142 04 at A12, A13, Photo Target 25CM _____

END OF TAPE

ENDEAVOUR ... A12, A13 photo target 25,PM3 and setting B4, 15 frames at 20 seconds from mag Q.

CAPCOM Okay, everything's right except 15 frames at 10 second intervals. One zero.

ENDEAVOUR Ahso. Okay, 15 frames at 10 seconds.

CAPCOM That's right and the computer is yours.

ENDEAVOUR Okay.

CAPCOM Okay, the only other important thing on this front side pass is to get up the camera pad to you. That's about the same page there.

ENDEAVOUR All right, go ahead.

CAPCOM Okay. The mapping camera photo pad starts 141 17 26, 144 09 30, and right down below is the pan camera pad, 141 46 11, 142 01 31 and as a part of this just across the page there at 141 45, we would like to move down that statement, mapping camera image motion increase, move that down to 57, 141 57. And that's all.

ENDEAVOUR Roger. Understand. The mapping camera photo pad is 141 17 26, 144 09 30. The pan camera photo pad's 141 46 11, 142 01 31 and move the mapping camera motion increase to talkback barber pole from 141 45 to 141 57.

CAPCOM That's excellent. I also have science report which you can probably pick up on the next rev. And consumables report and I guess we would like a status report from you. We could either do that now or early in the next rev. How do you feel about it?

ENDEAVOUR Oh, I can give you the status report now, I think, Karl. Standby 1. Okay, Karl, I guess crew status report got 6 hours sleep all in one period and very good night's sleep from my end and my PR - no medication, and my PRD is 23149.

CAPCOM Roger. 23149.

ENDEAVOUR And standby for the consumables.

CAPCOM What was that comment on consumables? Would you like to copy them now?

ENDEAVOUR Roger, Karl. Might as well get them now.

CAPCOM Okay. The time is 140 hours, RCS total is 61, QUAD A 61, 61 59 61; H2 tanks 70 70 48; O2 tanks 75 78 60.

ENDEAVOUR Rog, Karl. 140 00, RCS total 61, it'd be 61 61 59 61; H2 tanks 70 70 48; O2 tanks 75 78 60.

CAPCOM That's correct. And they say that they would like to have you do the configuring of the DSE that comes up there at 141 35. And if you can listen for another minute I've got an ECOMM status if you'd like.

ENDEAVOUR Roger. Go ahead. I'll be doing a P52.

CAPCOM Go ahead on that and the report is mostly nominal on everything. It says that the fuel cells are nominal. The spacecraft average current has read about 80 amp. Cryo purity is good, judging from the very little

CAPCOM effect of the fuel cell purges. The battery charges all have been nominal. The cryo quantities are above the nominal flight plan level and the ECS system operation has been normal. And that takes care of the ECOMM report.

ENDEAVOUR Well, that certainly sounds very good, Karl.

CAPCOM Okay, Al, we're going to have LOS in about a minute and all the systems down here look GO.

ENDEAVOUR Roger, Karl.

END OF TAPE

CAPCOM Endeavour, this is Houston. How do you read?

ENDEAVOUR Houston, Endeavour. Read you loud and clear.

CAPCOM Very good.

ENDEAVOUR And, Karl, Endeavour. I've got a message for our friends this morning.

CAPCOM Go ahead, Endeavour.

ENDEAVOUR Okay. If the King is there, (Marahabe Alalardee Denendeavour Ezakoomzlem)

CAPCOM Beautiful. If he's not down there listening I'll make sure it gets relayed to him, if I can remember.

ENDEAVOUR Okay. And I got some gyro torquing angles for you.

CAPCOM We're ready to copy.

ENDEAVOUR Okay. Stars used were 01 and 36, NOUN 05 was plus four balls 1, NOUN 93 was minus 00004, minus 00050, plus 00041, they were torqued at 140:49:00.

CAPCOM Roger, Al. That all came through loud and clear. And you're coming up in a few minutes - in a few seconds to a gamma ray gain step operation.

ENDEAVOUR Roger. And then I'll get back with you on the Delta P.

CAPCOM Roger.

ENDEAVOUR Okay. The shield is off and the Delta P, the mapping camera extension was 3 plus 50, the gamma ray retracts was 3 plus 12, and unfortunately the mass spectrometer boom when I go to retract even now I get a barberpole. It never did go gray.

CAPCOM We copy and we're sorry to hear that.

ENDEAVOUR Although I'm not so sure but what part of our problem is not in the talkback indicator itself. After 3 - well, 3 to 4 minutes I was watching the talkback and saw no change so I went to extend and noticed that the talkback jumped about half position in the window. So apparently what's happening is that the talkback is not triggering before gray, it's going about half way. There's about a half barberpole in the window and if I go to extension, I get four barberpoles. So that may indicate that it's just a talkback problem.

CAPCOM Roger. We copy.

ENDEAVOUR I don't know whether you understand all that or not. But - -

CAPCOM I'm not sure.

ENDEAVOUR I'm sure it is - I sort of feel like maybe there's a talkback problem.

CAPCOM Right. Incidentally, how many times did you cycle the switch on the deploy retract.

ENDEAVOUR Oh, I guess I probably cycled it 3 or 4 times.

CAPCOM Okay. I guess the reason I asked is I think we have a suspicion there that we have that cable not coiling correctly and recycling may feed the coils correctly and solve the problem.

ENDEAVOUR Okay. I'll go ahead and deploy and retract it. I'll cycle it a few times here and see if I can get it.

CAPCOM Endeavour, a time hack is coming up very shortly on the pan camera.

ENDEAVOUR Roger.

CAPCOM Okay. We have 30 seconds before pan camera mode goes to operate.

ENDEAVOUR Roger, Karl. Right with you.

CAPCOM Al, we'd like to have high gain antenna auto now.

ENDEAVOUR Auto.

END OF TAPE

CAPCOM Al, if you're not too busy now, I'll send you up a science report. And I can cue on that GAMMA RAY gain step.

ENDEAVOUR Okay. Go ahead.

CAPCOM Righto. Here we go. On X-ray spectrometer, words by Izzy Adler, say the general health of the X-ray experiment is excellent. And a large amount of useful data is being received. The number 1 channel for the number 1 X-ray detector tends to be a little noisey, but on the whole, this is no great consequence. On the whole, the data is very pleasing. We have high hopes of soon being able to produce a compositional map along the ground track, for all, for Aluminum, Magnesium, and Silicon. And I just heard some words, that come Monday, I guess that's tomorrow, they begin to hope to produce some crude maps as to how these things are changing with position on the surface. GAMMA RAY Spectrometer. Analysis of last night's long run of data, last night was about 24 hours ago. Indicate the number of definite features corresponding to expected energy for natural radioactivity of Potassium, Thorium, and Uranium. And to some cosmic ray excited elements. Okay, I guess it's about time for us to run that GAMMA RAY gain septer shield on center and start a charge on battery A. Maybe I should slow up a second and let you start the charge.

ENDEAVOUR Okay, Carl, go ahead. It's on.

CAPCOM Okay. One more comment on the GAMMA RAY spectrometer. It says that regional differences have been observed in the quick look data. But details will require computer analysis for conformation. So they're beginning to see some point to point differences there also. On the ALPHA particle spectrometer, we say the ALPHA particle spectrometer has continued to operate satisfactorily for the most part. One of the ten detectors does show at certain times an increased number of counts that are probably detector noise. The internal calibration sources indicate that the gain of the instrument is stable. And, yesterday we heard words to the effect that some Radon was being detected but they're being cautious about saying anything very definite yet about exactly what is coming out. Mass Spectrometer - it says that mass spectrometer data from the first two periods of operation indicates several constituants, which may be native to the lunar atmosphere. In particular, I think we have definite confirmation of native Argon both mass 40 mass 36. And the reason that we feel reasonably positive about this, is that there is a jump by a factor of 3 from the night side to the day light side as you would expect for a residual atmosphere about the moon. And, there is a final caution here saying identification of Argon as a native gas is tentative

CAPCOM pending positive determination of contamination levels during the (garble) data collection period. So, we've still got a contami,- we've still got to calibrate their instrument before they will be completely sure of this data. Photo report says the mapping camera operation is nominal and the laser data up till now has been very good. I understand that the laser is beginning to drop an occasional pulse that gives them some concern, so that we'll probably not be using the laser as extensively as we have in the flight plan. There'll be some cut back I think to conserve it's health and energy. Although, the data we're getting is still very good. Data from revs - this is going back to the pan camera. Data from revs 15 and 16 indicates that we're still getting, as we said before, about 80-percent of the photographs good. And we have some estimates here. The, - of what we expect the quality to be on the bad frames for as on the good frames we're expecting a resolution on the order of two meters. The bad frames, or the smeared frames will be giving us about a resolution of 6 meters, about three times degradational, about three in the - in the resolution there. Still be useful data.

CAPCOM It says there's no final resolution yet of the problem with the V over H sensor. Because of the V over H malfunction, photos of the landing site on rev 16 were not the best and we may attempt running the camera in stereo self-test mode on rev 50 over the landing site.

CAPCOM And on the V over H sensor, Al, one of the possible reasons for that malfunction is the possibility of a piece of Mylar or something flapping in front of the light sensing apperture and when we rendezvous we may have a chance to inspect that and see if that would be the source of our problem. I don't know what we could do about it, but at least it would be nice to understand it.

ENDEAVOUR Rog. Carl, we can check that out and if we don't see anything there, we can check it out during the EVA.

CAPCOM Very good. Good idea.

ENDEAVOUR And, the mass spectrometer is now fully retracted (garble).

CAPCOM Wonderful. Just recycling it a couple of times and it finally came in; is that what happened?

ENDEAVOUR Well, it took, I guess probably a half a dozen re - just recycles jogging it out then pulling it back in again and that may be - that may be the problem. Maybe that cable's kinking some way or other.

CAPCOM Okay. Real glad to hear you got that great talk back.

CAPCOM Incidently, the boys on the surface just about took a shower bath this morning. They had a small

CAPCOM water leak in the conveyor that let loose a couple of gallons of water. It was a major perturbation, although they've got it cleaned up pretty well. And they're running about an hour to an hour and a half behind their timeline on the second EVA. They haven't got out yet.

ENDEAVOUR Roger. Understand.

CAPCOM Okay, Al, we have about 10 seconds before we give the image motion increase for the mapping camera.

END OF TAPE

CAPCOM Endeavour, this is Houston. You have 30 seconds until pan camera mode goes to stand-by.

ENDEAVOUR Rog, Karl, be right with you.

CAPCOM Al, we're still waiting for a cue on the lens stow, and in the meantime, photo target 25 is roaring down on us.

ENDEAVOUR Rog, got it in sight.

CAPCOM Endeavour, Houston, we can go pan camera power off.

ENDEAVOUR Roger, power off.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 CST6:40 GET142:06 CM69/1

CAPCOM Endeavour, this is Houston, when you get the camera stowed, I have one more small item and then we'll give you some time to get out some food.

ENDEAVOUR Okay, it's stowed, go ahead.

CAPCOM Okay, Al, we're finding out that the dead band in P20 is using a little more RCS propellant than we'd anticipated. Nothing's critical yet, but we would like to take some preventive measures and we suggest that you go into the caps, and load in a CSM weight of 30,000, thirty thousand, and before you erase the current LM weight recorded - the current CSM weight record it for future use. We think that'll cut down the thruster firing a bit.

ENDEAVOUR Okay, understand, rog, you want me to go back and reload the DAP with a CSM weight of 30,000 and record the current weight that's in there for future use.

CAPCOM That's correct.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 142:16 CDT 6:50 CM70/1

CAPCOM Endeavour, a news bulletin from the surface says that they are now depressing the cabin and there is no need for you to acknowledge. PD

ENDEAVOUR Roger, Houston, understand that and what points from here, Karl, . . below the spot in Imbrium I think close to where you and Whitiker drew from or figured out some lava flows coming out of where Rico Ridge is and at this low sun angle, I can very clearly see some lava flows coming out of what appears to be a ridge, extending in both directions from the ridge and I wouldn't set up a time to take a picture of it, but it might be interesting on the next path if we could get a pat to take a picture of that.

CAPCOM Very interesting, which window are you looking out?

ENDEAVOUR I'm looking out window 3.

CAPCOM Window 3, that sounds like it's down to the south of you then.

ENDEAVOUR Just slightly north of contact.

CAPCOM Very good.

ENDEAVOUR Just down south, just a little.

CAPCOM Thank you. Sounds like an interesting observation and I'm sure the guys down below will be sending you up more work to do as a result. Be careful there now.

END OF TAPE

CAPCOM As I look at the map, Al, it looks to me like you're going smack over Tsiolkovsky every rev now. How is it looking to you?

ENDEAVOUR That's just about right, Karl, coming right over the middle of it.

CAPCOM That must be a beautiful sight. Hey, I was sort of fascinated by the fact that on your first couple of revs you noted that you could really see the peaks sticking up by the central peak before you could see the rim. Is that really true?

ENDEAVOUR Well, that's not really true because it's so hilly and ridgy down in that particular area that you just don't see the rim. And Tsiolkovsky is big enough so that do get some at least optical impressions of the central peak being higher than the ridges. But I think it's just because the basin is big enough, far enough across, that you're - as you're looking from one rim to the other, the curvature kinda gets to you and makes the central peak appear higher than it is. But it is a very, very high central peak; it's a very large mass. And as a matter of fact, on the last couple of revs, I've been watching the central peak and I'm pretty sure that I can see some layering in the central peak there and there should be some pictures of it - I got some pictures looking down on it. But it looks like a big slab that's been stuck up on edge.

CAPCOM Hey, that would be great to get pictures of that. I don't know when you were scheduled to look at that - that landslide on the northwest corner of it, are you seeing anything of that area?

ENDEAVOUR Absolutely, I look at it every time I go by and there's no question in my mind at all that it is a - that it is a rock avalanche. It does have some interesting qualities about it though. And it's a little bit hard for me to decipher right now, but it seems like the density of crater impacts in that slide is greater than in the surrounding terrain, even though the slide had to be implaced on top of the surrounding terrain. Maybe it's just that the craters are fresher in that - fresher looking in that particular material. But no question about the lineaments being parallel to the direction, the travel of the flow in the low peak plateaus, in the - all the, all the characteristics that I've seen of a rock avalanche.

CAPCOM Roger, that sounds interesting.

ENDEAVOUR Just want to add one other comment to that. So far, I havn't been able to locate the other one.

CAPCOM Say again on that, Al?

ENDEAVOUR So far I haven't been able to locate Al-Birun.

CAPCOM Roger, okay.

CAPCOM Al, Alvin heard that and he feels crushed.

ENDEAVOUR Well, tell him not to worry. I'm sure it's there and I've just got to get a little bit further south around the edge of the crater.

CAPCOM Okay. Hey, when you can get on the flight plan and a pencil, I've got a few more updates to finish up on this rev.

ENDEAVOUR Okay, go ahead.

CAPCOM Okey-doke, let's go over to 143 hours. And at 143:09, we want to add --

ENDEAVOUR Say, Houston, Endeavour, go ahead with your updates, Karl.

CAPCOM Roger. At 143:09, we would like to add laser altimeter OFF; at 143:12, in that P20 there, we would like you to do a verb 25 instead of a verb 24; and we would like to add, in addition to your 2 angles there, we would like to add Omicron plus 16100. Did that come through?

ENDEAVOUR Rog, understand, we're going to do omicron. we're going to add omicron to that load of plus 16100.

CAPCOM Roger. And we're going to do the same trick over on 144 hours and 26 minutes. We want add, again to that load, we want to add omicron plus 18000.

ENDEAVOUR Understand, at 144:26, you want to add a verb 25 down 78, Omicron plus 18000.

CAPCOM That's correct. Next change is over on 146:13. And over there we have a laser altimeter OFF, which had already been put OFF before so you wouldn't delete laser altimeter.

ENDEAVOUR Rog, delete laser altimeter OFF.

CAPCOM And then if we go over to 151 hours. At 151 hours and 10 minutes, we would like to change the pan camera operation there and we would like to say stereo exposure NORMAL. And at 151:15, we would like to delete the pan camera exposure NORMAL.

ENDEAVOUR Okay, I understand, at 151:10 you want that to read stereo exposure NORMAL and at 151:15 delete that light.

CAPCOM That's correct and that's the end of the update.

ENDEAVOUR Okay.

END OF TAPE

CAPCOM Endeavour, this is Houston. They have some data on that new DAP configuration with the new weights. I guess we're not sure you want to stick with it, and at this time we'd like you to go back to the normal DAP load with the weight.

ENDEAVOUR Okay, Karl, understand you want me to go back to normal DAP load and normal weight.

CAPCOM Roger and I was so busy talking I forgot to cue you on the gamma ray boom. I trust you have started - you got that out yet or did I talk you out of thinking about it.

ENDEAVOUR Negative, it's out.

CAPCOM Very good. Thank you.

CAPCOM Did you record an extension time on that.

ENDEAVOUR No, I didn't get that, Karl.

CAPCOM That's okay.

CAPCOM Endeavour, this is Houston. All your systems look go as you go around the corner. And see you on the other side.

ENDEAVOUR Okay, Karl. See you on the other side.

END OF TAPE

APOLLO 14 MISSION COMMENTARY 8/1/71 GET 143:31 CDT 8:04 CM73/1

CAPCOM Endeavour, this is Houston, how do you read?

ENDEAVOUR Hello, Houston. Endeavour reads loud and clear.

CAPCOM Reading you loud and clear likewise.

CAPCOM Al, if you have time to listen, I have some news bulletins down here, and when we are in the middle I will break in for the high gain antenna auto.

ENDEAVOUR Okay Karl, go ahead.

CAPCOM Right, this is the morning national and world news. The world being, of course, the planet Earth. President Nixon, yesterday, declared his administration is determined to revitalize the American country.

ENDEAVOUR (garble)

CAPCOM Go ahead. I missed that one Al, say again.

ENDEAVOUR That's your world right now.

CAPCOM That's right, that's our world.

ENDEAVOUR Our world is up here right now, Karl.

CAPCOM I'll give you some news bulletins on that at the end. Things are coming along good in the EVA. Okay, President Nixon was what . . he was at ceremonies dedicating a dam in Iowa and he said the economic potential of rural areas must be developed, quote, that the people who live there can be first class citizens enjoying a first class way of life, unquote.

ENDEAVOUR Roger, copy.

CAPCOM In the labor area, about 4,000 Houston area steel workers are expected to be off the job today in a nation-wide strike against 9 major steel companies. That's beginning to loom as a pretty big factor in economic world down here. Senator Mansfield said Saturday chanches are good that the senate will reach an agreement to stop talking and speed up a vote on a bill to rescue Lockheed Aircraft Corporation. The President of Pakistan has accused neighboring India of continued artillary strikes across the border and said quote, we are very near to war with India, a very sad note there. And Senator Edward Kennedy and Senator Edmond Muskie are tied for the top spot in the latest Democratic standings according to the Gallup Pole. I'm sure you'll be fasinated. And in the World of Sports, in football, the Houston Oilers lost their first exibition game to Los Angeles, 17 to 6. In baseball, the Astros won for a change, beating the Expos 6 to 4, and in golf Jack Nichlaus and Arnold Palmer shot a total of 64 to take a 4 stroke lead in the PGA National Team Championship in Ligonier, Pennsylvania. Okay and we are ready for high gain auto, Al.

CAPCOM Up on your planet, the latest word is that the Rover is still functioning brilliantly and the fellows are well into EVA number 2 and just recently passed Cresent Crater and Dune Crater well on their way to exploring the Front at Hadley Delta.

ENDEAVOUR Sounds great.

CAPCOM Yep, everything is going great, both in orbit and on the surface. Everybody is very pleased.

ENDEAVOUR Okay Karl, if you're through with the news, let me give you some words on Tsiolkovsky.

CAPCOM Great, we're listening.

ENDEAVOUR Okay, I'll take the items one at a time as they come. First off, the central peak. Central Peak is a very large spur peak on the south and east sides getting blocky on the north side and there is what appears to be some layering visible on the south and west, exposed scarp of the peak, dipping to the north about 30 degrees.

CAPCOM You're coming through loud and clear.

ENDEAVOUR Okay, the light material . . the light colored flow material around the edges of the basin texture appear to be nothing more than just simple mass wasting off of the edges or off the rims around the basin. The rims themselves are quite cut with the mass wasting in a . . oh I'd say an extend of about 330 degrees on the north, east, and south sides. Now on the west side the rim there is a very very large clean scarp, and when I say clean, it goes almost from the basin floor to the rim itself in one large chunk, and that scarp appears to define the limits of a couple of fault zones that go through that rim of Tsiolkovsky, it was . . I couldn't trace the fault zone beyond Tsiolkovsky from the vantage point I had very well, but they're very distinct in the wall itself, and one fault zone coincides, or occurs in the same location as the southern most edge of what appears to be a rock glacier extending northwest into Fermi. That rock glacier has all the flow bending and the loping toes characteristic of what we consider a rock slide, however, one feature about that slide that I mentioned before is that it has what looks like fairly fresh crater impacts on the slide itself and seems to have more impacts, in other words a higher density of craters than the surrounding floor of Fermi, although Fermi looks . . the floor looks much older, its much smoother, more like (garble) formation.

CAPCOM Roger Al, we're copying.

ENDEAVOUR Okay, looking more to the south, I see no evidence of another rock slide to the south, the pictures might indicate . . might hint at some kind of a rock slide

ENDEAVOUR there, but it appears that it is more ejected now, the picture doesn't clearly show the ejective from Tsiolkovsky, but the ejective pattern and the flow . . the flow line are at least observable around most of Tsiolokovsky and the ones that we see on the south and west side of Tsiolokovsky seem to be more ejective than anything else. I couldn't see any distinct unit there that could have been a flow, such as the one in the northwest corner, and it appears that what linements there are in that particular part of the . . of the ejecta are merely a . . ejecta patterns. Looking intc Waterman, there is a small flow that goes into Waterment, but it doesn't come from Tsiolokovsky itself and I couldn't locate the source of the flow, but it seemed to just come down the side of Waterman and out into the basin. I do have some pictures of it, maybe we can tell from the pictures, but the . . what looks like on the picture as you're looking at the picture in the landmark book, looking at the V1A, Victor one able, it looks like there is a, maybe a breach in the wall of Tsiolokovsky, between Tsiolokovsky and Waterman, possibly allowing some flow into Waterman. Well, visually that . . that particular breach in the wall doesn't show up, the terrain here is much more level than it would appear in the photo and there is definitely the elevation relief between Waterman and Tsiolokovsky. The flow does come from the direction of . . on the north side of Waterman toward Tsiolokovsky and I guess my impression would be that that flow came down the side of Waterman possibly out of some fracture or fault concentric to Tsiolokovsky, but outside the basic rim itself.

CAPCOM Roger A1.

END OF TAPE

ENDEAVOUR One other comment, I guess, and that is, on the crater pair, just north of Tsiolkovsky, the smaller of the craters on the west side, apparently was an original crater, with an impact ocurring along side it, not that's a - that appears like mass wasting or some kind of a rock avalanche into the western most crater into the smaller of the 2 craters and the rim of the eastern most crater, I'm sorry, reverse those directions, I'm looking at it upside down, the smaller crater is on the eastern side, has what looks like a rock slide in it. The larger crater on the west side has a fairly intact rim, being faulted in a couple of places where it crosses the rim of the crater to the left, but that rim is fairly intact. The rim that was apparently moved or obliderated by the most recent impact was the rim of the smaller crater to the west and that's where all the rock debris is, and has fallen into the crater on the west.

CAPCOM Very interesting.

ENDEAVOUR Okay, now I'm going to Picard.

ENDEAVOUR Houston, Endeavour

CAPCOM Endeavour, go ahead.

ENDEAVOUR Okay, Houston, Endeavour's coming up over Picard and I thought I'd just go ahead and talk while we're going over Picard. First, talking about the color variation, Picard is a slightly different color than the rest of Mare Basin. It's, I guess what I would consider Crisium a light brownish gray. Picard itself is more of a brown tone, and it has a darker halo around it. I can see some of the brown material just on the outside of the rim, and outside of that is some darker material that gradually turns into the gray of Mare Crisium. Inside Picard I can see, well let's see now let's count them, 1, 2, 3, 4, 5, 6, 6 distinct rings that go around the inside of Picard, and the walls in Picard are very shallow. It looks like a very shallow, almost like a dish kind of basin and just gentlly from the edges on in toward the center, and as I say I can count 5 or 6 rings inside they're all concentric with the center of the basin, and I can see some definate layering in, particularly in the upper boundary of the rim. Now as opposed to, oh, let's say Link, Link is, Link looks like its almost completely obscured feature now, it looks very much like a collapse, all I can see is a little bit of a ring, a color variation with some positive relief, and inside the crater looks very much like outside the crater as far as color and texture are concerned however it does appear to slope gently in towards the center. Link looks to me like a very large collapse feature with the same kind of material both inside and outside the basin.

CAPCOM Roger, we're copying loud and clear.

APOLLO 15 MISSION COMMENTARY 8/1/71 CST8:16 GET143:43 CM74/2

ENDEAVOUR And I make the same comment about Ukert, and I'm on beyond it now I'm looking at Proclus now. And I might as well comment on Proclus while I'm here. Remember yesterday, we were talking about variations in the crater wall to that - well I don't exactly know how to describe it but there's a tremendous variation in the wall, which does line up with the ejecta pattern. It is almost a straight wall on the side of Proclus, that is minus an ejecta pattern, and there is some breakthrough directly in the middle of that wall which makes Proclus looks like it's almost a circular crater, however the truth is that Proclus looks like an elongate crater with one wall dipping quite steeply into the crater, and that wall is oriented perpendicular to a line bisecting the excluded zone dipping into the crater, and then right, right at the middle of that portion it looks like there was 2 small, well a small piece of that wall was also ejected but it was only at the top part of that soft scarp, and so if you look at it from the right angle you can see almost a flat plate, which looks like it's cut right into Proclus, and to the north and west of that flat plate is the crater Proclus and to the south and east is a small chunk out of the top of it that coinsides with the central part of the excluded zone.

CAPCOM Roger, Al.

END OF TAPE.

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 143:55 CDT 828 CM75/1

CAPCOM Roger Al, we copy.
ENDEAVOUR Hope you could understand all that, Karl. I had to talk fast and formulate as I went.
CAPCOM Roger, it came through loud and clear and I think it was quite understandable. Very good.
ENDEAVOUR Okay, I'm drawing a couple of little pictures of it to show you when I get back.
CAPCOM Okay, Al, we have earth shine photography coming up in about 15 minutes. I'd better give you a pad on it and I also have another pad for later photography on that page, we're on the following page.
ENDEAVOUR Okay, Okay, Karl. Stand by one.
ENDEAVOUR Okay, Houston. Go ahead with your shine pads.
CAPCOM Roger. Shine pad at about 144 hours and 5 minutes in your flight plan, the number is 1441032.
ENDEAVOUR Understand, 1441032.
CAPCOM Roger, and on the next page. Map camera photo pad take it.
ENDEAVOUR Go.
CAPCOM Start 145 1416, stop 146 1356.
CAPCOM Did the map camera photo pad - -
ENDEAVOUR I have map camera photo pad.
CAPCOM Roger.
ENDEAVOUR Negative, you were cut out.
CAPCOM Oh, roger. Mapping camera photo pad. Start 145 1416, stop 146 1356.
ENDEAVOUR Understand T start 145 1416, T stop 146 1356.
CAPCOM That's correct.

END OF TAPE

APOLLO 15 COMMAND MODULE 8/1/71 14405 GET 0838 CDT CM 76/1

CAPCOM Al, we've got 30 seconds until the mapping camera comes off. And then 1 minute later, we start revving up for the earthshine photos.
ENDEAVOUR Rog, Karl.
CAPCOM Okay, we start earthshine photos in about 20 seconds.
ENDEAVOUR Rog, Karl, understand. And, listen, since I got all the lights turned out here, how about stepping me through the earthshine photos.
CAPCOM Roger. Okay, we're plus 4 minutes right now, in 6 seconds. 4 frames at 30 second intervals

END OF TAPE

ENDEAVOUR And Karl, I hope these all turn out, cause this is the area on the last (garble) rev that I commented on all the lava flows that we are right over now taking pictures.

CAPCOM Very good.

CAPCOM Okay, after your fourth frame you are going to change the shutter to 1/15th of a second. And then take four more frames at 30 second intervals.

ENDEAVOUR Okay (garble)

CAPCOM I'm sorry, I could have been counting time for you too, we're coming up to plus 6 minutes which should be about the 4th frame at the old setting. We'll mark on 6 minutes.

ENDEAVOUR Okay, got it.

CAPCOM And I'll call out times for you now too. We go to 1/15th of a second.

ENDEAVOUR Okay, I just took one frame at 1/15.

CAPCOM Excellent.

CAPCOM Plus 30 seconds after your first picture.

CAPCOM Take number 3.

CAPCOM Take number 4 and change shuttle setting to 1/8th.

ENDEAVOUR Roger.

CAPCOM Now we are going to take 10 frames at 30 second intervals. Give me a mark on your first one.

ENDEAVOUR Okay, mark.

CAPCOM Time for number 2.

CAPCOM Take 3.

CAPCOM Take 4.

CAPCOM Take number 5.

CAPCOM Take number 6.

CAPCOM Take 7.

ENDEAVOUR Roger, take 7, and I just went past the spacecraft terminator.

CAPCOM Say again. Roger, we copy.

ENDEAVOUR Okay, I just went by spacecraft terminator.

CAPCOM Roger, we copy. Take 8.

CAPCOM Take number 9.

CAPCOM Take number 10, change the shutter to 1 500th, cover the lens and cycle one frame.

ENDEAVOUR Okay, thank you.

CAPCOM Okay, Al in case you don't have your Flight Plan handy, we need to start a P20 plus X forward and . . in a couple of minutes and that will be followed by deploy of the gamma ray boom.

ENDEAVOUR Rog, Karl, I'm on it.

END OF TAPE

CAPCOM Al are we in time to get a mark from you when you start the gamma ray boom out?
ENDEAVOUR Rog, I'm ready now. Gamma Ray boom going out, now.
CAPCOM Thank you.
CAPCOM Hey, time for exercise, Al.
ENDEAVOUR Yea, I guess that's right, Karl.
ENDEAVOUR Okay Karl, mark on the gamma ray boom.
CAPCOM Thank you.
CAPCOM Al, you may be interested to know that the rover boys are up on the slopes of Hadley Delta now. They got themselves up to an area where there is considerable angle on the hillside and I guess maybe almost 30 degrees, and it's still very fine soil which acts alot like snow, and you should have saw Dave about 5 minutes ago took a beautiful spill in it.
ENDEAVOUR Tell them to be careful.
CAPCOM Roger.

END OF TAPE

CAPCOM Endeavour, this is Houston. How do you read?

ENDEAVOUR Hello Houston, Endeavour. Reading you loud and clear.

CAPCOM Same here. How goes it up there?

ENDEAVOUR Fine, Karl. And I got a couple of comments on Tsiolkovsky, in addition to what I said last rev.

CAPCOM Go ahead, we're ready to copy.

ENDEAVOUR Okay, talk - discussing the flow in crater Waterman, south of Tsiolkovsky, I guess what I said before still applies. The - looks like on the map there's a channel between Waterman and Tsiolkovsky is in fact too high for anything to flow between the two. There's definitely some elevation there. However, looking at it this time, it's pretty plain that that channel or gully or whatever you call the breech in Tsiolkovsky's wall there between Waterman and Tsiolkovsky is caused by a graben-like fault system there are two faults that run through there and they run almost north and south right towards the central peaks, diverging - the one on the west side, is slightly - is angled slightly to the northwest, but the other one goes almost directly north. And the source of the lava flow in Waterman appears to be high in the wall of Waterman, on the north edge right where the fault zone crosses the rim of Waterman.

CAPCOM Roger, Al. We copy.

ENDEAVOUR Okay, now there are a couple of other small craters around Tsiolkovsky, particularly one on the north side on the northeast corner, the first large crater that you see there has a very distinctive lava flow or some kind of flow down in the crater. And that flow also originates up in the corner or up in the - high towards the rim of that particular crater where there's some contact between Tsiolkovsky's rim and the rim of that small crater.

CAPCOM Roger.

ENDEAVOUR Now again, I saw no evidence of any kind of a rock slide to the south of Tsiolkovsky, but the one on the west there is, looks - everytime I go over it, certainly confirms my opinion that that's a rock slide. The linaments, the way the thing ended, the low (garble) and everything.

ENDEAVOUR It's interesting that the rim of Tsiolkovsky on the west side there, is different from across that fault zone - is quite different from it is around the rest of the crater, maybe suggesting that that's the source of a flow. The rim seems to be not as sharply defined, it's lower and appears to be out from the edge of the basin more than the rest of the boundary or the rest of the ejecta pattern around Tsiolkovsky, and there that very steep almost smooth scarp is, on the west of Tsiolkovsky seems to be the point at which it starts.

CAPCOM Al, Vance here. You have any comments on the rim of the northwest side, where you, it appears the rim might have slipped or where you have a fault which shows the displacement?

ENDEAVOUR Oh, yes, Vance. It's very deffinitely a couple of fault zones through there and you can see the displacement quite clearly from the air. The one, the fault zone between Waterman and Tsiolkovsky, is a lot more suttle, but I'm quite sure that, that's what's going on there. But the one on the West side is very clear. That's true.

CAPCOM I always like to have high gain auto.

ENDEAVOUR And, Vance, another comment about that. You've got high gain auto, by the way. Another comment about that, where that fault zone appears on the West side, there's much less mass wasting into the interbasin of Tsiolkovsky, than there is around the rest of the crater. Most of that mass waste seems to taken place out side the crater.

CAPCOM That's an interesting observation.

ENDEAVOUR Al, Vance and I called up to your apartment a little while ago. Your folks are there, and I guess as you know, they've got a squawk box listening in.

ENDEAVOUR (garble)

CAPCOM listening on our (garble) with great interest. Except when you go behind the moon, then they watch the other show, taking place on the surface. They said to say hello. And, they sound like they are having a good time up there.

ENDEAVOUR Very good. Very good. Hello folks.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 145:39 CDT 1013 CM80/1

CAPCOM Al in 30 seconds we're coming up to a pan camera operation mode. Stand by, power on.

ENDEAVOUR Rog.

CAPCOM Al, while we're waiting for that pan camera off cue, I've got a couple of photo pads - a couple of flight plan updates here for you if you can copy them.

ENDEAVOUR Okay, Karl go ahead.

CAPCOM Okay. 148 hours and 0 minutes they would like to have you get some good shots on those lava flows you saw over in Imbrium and the recommendations that we have are as follows, CM 3 EL 250 mm lens, CEX FI.6, 1/125 infinity, 5 frames at 10 second intervals. Recommend convergent photos starting at TCA minus 30 seconds. The aim point is up to you. Magazine cue and record frame number and then on the same page, 148 hours and 18 minutes, we don't need to do that P52 there because the platform looks very good.

ENDEAVOUR Okay, Karl. Understand photos of the lava flows in Imbrium, then we noted on the last rev, that'd be CM3 flash EL, flash 250 dex F 5.6, 1125, infinity 5 frames in 10 seconds, used magazine Q and tried to get convergence stereo starting at TCA minus 30.

CAPCOM That's correct.

ENDEAVOUR And also delete the P52.

CAPCOM Roger.

ENDEAVOUR Karl, while we're going over Crisium here, looking down at Picard at Pyrus and at Lick, I noticed that all of those craters, that's Lick Delta by the way, Lick Delta, Picard, and Pierce, all look like - they're all about the same. They all have the same ring structure, all have the same low rims, the rims are what look like very shallow compared to the rims on the other craters I've seen around and also they all have a slightly darker halo effect around the entire crater. But the color difference is very subtle.

END OF TAPE

ENDEAVOUR - - color difference is very subtle.
CAPCOM Roger, Al. As I look on the map here they look like they might have been old craters flooded by the mare. Does that seem feasible to you as you look at them?
ENDEAVOUR No, it doesn't to me, Karl. They're a quite different texture inside. You can see the ring structure clear down to the bottom of the crater. So I would say that they were not flooded craters.
CAPCOM Roger. Okay.
CAPCOM Hey, Al. Relavent to your observations coming up on Littrow here, Farouk has asked whether the comments that you made previously about Littrow seeing a manteling of dark material everywhere with a few puddles in the valleys, whether that same comment would pertain to Sulpicius Gallus.
ENDEAVOUR Yes, Okay. Sulpicius Gallus. Certainly Karl.
CAPCOM Do they look like very similar areas or are there some contrasts.
CAPCOM Okay. I'll let you know when I get there. Unfortunately, I think I'm going to be out of attitude to take a look at Sulpicius Gallus.
CAPCOM Okay. That's for future reference then.
ENDEAVOUR Yes, okay. But if I can see across Serenitatis there, I'll give you a hack on that.
CAPCOM Okay. I guess I should keep quiet a while and let you look at Littrow coming up in about a minute.
CAPCOM Al, we can have pan camera power off now.
ENDEAVOUR Okay. Pan camera power off.
ENDEAVOUR Houston, Endeavour.
CAPCOM Go ahead, Endeavour.
ENDEAVOUR Okay. Karl, I can give you at least a partial answer on that question. The coloration that seems to be continuous from Littrow all the way around to Sulpicius Gallus is the middle color. It's slightly darker than the rest of the mare basin itself and not quite as dark as some isolated or localized areas within the LIttrow area. Now those localized areas in the Littrow area were the areas in which I saw what appeared to be some rather prominant distinctive cindercones with their own respective dark halo. It seemed to be the same darkness as the rest of the material in the local areas within the Littrow area. In other words, there are three variations of color. There are three tones of color in the Littrow area. The darker tones are associated with the lowland areas like the valleys and like down on just the edge of the mare surface. Then

APOLLO L5 MISSION COMMENTARY, 8/1/71, 10:23 CDT, 145:49 GET, CM81/2

ENDEAVOUR there's a lighter tone which seems to be associated all the way around the ring or the rim of Serenitatis from Littrow all the way around through Sulpicius Gallus. And I don't see any other colors around Sulpicius Gallus except that one. And they seem to end - -

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 145:59 CST 10:34 CM #82/1

ENDEAVOUR ---they seem to encompass the area between the first wrinkle ridge and the contact between the Mare Basin and the front there. Sort of like between the Archuan Rilles and the first set of wrinkle ridges in the (GARBLED) basin. And then, ; I'm looking at right now; I'm sorry I interrupted myself there, but looking right now at Bethyl; and Bethyl has some very distinct layoring. In fact; Bethyl looks like some craters some volcanic type craters we've seen on Earth, where, to get alternate lava flows and sedimentary kind of rocks, the lava will stick out of the edge of the wall. In Bethyl, about a third of the way down there is a very distinct ledge that can be seen all the way around Bethyl. The rest of the crater wall appears fairly smooth; but about a third of the way down is a ledge.

CAPCOM Roger. -----

ENDEAVOUR It looks like it's caused by a harder material.

CAPCOM Roger. You're coming through loud and clear.

CAPCOM Do any of the other craters around that area around Bethyl show the same sort of interior ledge like that?

ENDEAVOUR Well, unfortunately Bethyl is the only one with that magnitude around that particular area and I don't see any other craters that appear to go down below; whose depth appears to go down below the depth of the rim in Bethyl.

CAPCOM All right. I, the only 2 I see possible here are Bethyl E and Sulpicius Gallus; and I guess they might not go that deep even so.

CAPCOM Hey Al. Have you ever looked at a Adalicus and a Aristillus with the thought in mind of determining which overlaps the other; which is the younger?

ENDEAVOUR No I haven't yet Jim. Maybe this is a good time to do it.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 1044 CDT 146:09 GET CM 83/1

CAPCOM Endeavour. We have the mapping camera coming off in just one minute.

ENDEAVOUR Roger, Houston.

CAPCOM Al, I have a couple of comments on the water dump coming up in 10 or 15 minutes.

ENDEAVOUR Okay, go ahead.

CAPCOM We'd like to dump down to 10 percent, stop at 10 percent and they say that the dump will probably take about 8 minutes. So about 6 minutes after you start dumping keep an eye on it and stop at 10 percent. And also they'd like for you again to make an observation of the particle cloud at sunset and sunrise terminator. If you would please.

ENDEAVOUR Okay

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 1054 CDT 146:19 GET 84/1

ENDEAVOUR Okay will do and I understand you just want me to dump down to 10 percent.

CAPCOM That's correct and over at 146 33 where you have a gamma ray gain step sheild on center, we'd like you to make 1 step increase in gain there. That's up momentarily once.

ENDEAVOUR And that's at what time?

CAPCOM That's over at 146 33 where they want you to put shield on center. After you have it on center take up once momentarily for 1 step increase in gain and then leave it on center.

ENDEAVOUR Okay. I understand gain step shield on and go 1 step up and then leave the shield on.

CAPCOM That's affirmative.

CAPCOM Okay, Endeavour. We're coming up to gamma ray gain step shield off in about 5 seconds.

END OF TAPE

CAPCOM Al, a bulletin from Hadley Rille, says that -
ENDEAVOUR (garble)
CAPCOM Go ahead.
CAPCOM Go ahead, Al. We're listening.
ENDEAVOUR Karl, I didn't call. I'm waiting on you.
CAPCOM Roger. A bulletin from Hadley Rille, the crew finished their experation of the Apennine front. They got over to Spur Crater and actually into Spur Crater, found there a large block of rock, which probably is a really true sample of the Apennine front and got some good samples there. And, now they're driveing back down by the South complex and they're digging some samples around Dune Crater.
ENDEAVOUR Very good, sounds like they're doing quite well down there.
CAPCOM Yes, indeed.
ENDEAVOUR I think we're going to give lots of people lots of things to do for a while.
CAPCOM You said it.
CAPCOM Okay, Al. In about 20 seconds, we have the GAMMA RAY operation coming up.
ENDEAVOUR Roger, Karl.
ENDEAVOUR Okay. You've got the gain step, one step in back at you now.
CAPCOM Very good.
CAPCOM Al, this is Houston. All of your systems are looking in great shape as you go around the corner.
ENDEAVOUR Okay, Karl. And, we're looking okay up here. Getting ready to do the gegenschein calibration.
CAPCOM Very good.

END OF TAPE

CAPCOM Endeavour, this is Houston. How do you read?
ENDEAVOUR Hello, Houston. Endeavour. Loud and clear.
CAPCOM Good to hear your cheery voice. How is everything up there?
ENDEAVOUR Just fine. It took us a little longer to lock up that time.
CAPCOM Yes. A couple of minutes. But it still wasn't bad.
ENDEAVOUR And, Karl, on the waste water dump, I overshot 10 percent just a little bit, but I'm reading about 10 percent now.
CAPCOM How much was that?
ENDEAVOUR I'm reading 10 percent.
CAPCOM Roger. Reading 10 percent now. I copy that.
CAPCOM Al, we'd like to have high gain, NARROW and AUTO.
ENDEAVOUR Okay, Houston. You got it.
CAPCOM Very good. Thank you.
ENDEAVOUR And one other think, Karl. The attitude change from the Gegenschein calibration attitude to plus X forward SIM attitude was pretty squarely in the middle of gimbal lock. And I had to do some maneuvering to get around it. Used a little extra fuel. You might run that back through with (garbled)
CAPCOM Roger. We copy.
CAPCOM Al, still a little trouble on the high gain. Let's go wide beam for a second or two and back to narrow.
CAPCOM Endeavour, let's go back to REACT.
CAPCOM Al, we'd like to go pitch minus 11, yaw 12, without changing the mode switch.
ENDEAVOUR Understand, minus 11 and 12.
CAPCOM Affirmative.
CAPCOM Wide - Al, we need to go to wide for a couple of seconds and then back to narrow.
CAPCOM Endeavour, could we have wide beam again for a couple of seconds and then narrow.
CAPCOM Endeavour, this is Houston. How do you read?
ENDEAVOUR Houston, I'm reading you loud and clear, 5 square.
CAPCOM Good. Sorry about all of this high gain switching problem. We're - we'll try to get it squared away real quick. I'll let you get back to your parsley soup.
ENDEAVOUR Okay. I was just getting it out.
ENDEAVOUR And, Karl, you'll be interested to know

APOLLO 15 MISSION COMMENTARY, 8/1/71, 12:04 CDT, 147:30 GET, CM86/2

ENDEAVOUR I had a very good exercise period to start.

CAPCOM Very good. Glad to hear it.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 147:40 CDT 12:14 CM87/1

CAPCOM We're all squared away on the high gain now, Al. Thank you.

ENDEAVOUR Okay, Karl. Was there a problem associated with my gear, or yours?

CAPCOM We suspect that there was some problem about the new attitude and we were getting some sort of reflection off your skin up there.

ENDEAVOUR I see. Okay.

CAPCOM Endeavour, we'd like to have high gain AUTO.

ENDEAVOUR Okay. You got AUTO.

END OF TAPE

ENDEAVOUR Houston, Endeavour.
CAPCOM Endeavour. Go ahead.
ENDEAVOUR Okay. While I'm trying to get a bite of lunch here. I thought I would just tell you that after the dump, the same thing happened the same kind of cloud, the same kind of particles that I described yesterday and they've just about they've just about dispersed now. Well you know, Carl, the interesting thing, I haven't thought about it before, but once your sitting up here looking at the surface through one window and it's just pitch black out the other window so you go from a very bright scene in one window to black in the other.
CAPCOM Yes. So actually out the side window - out the dark window you are still able to see particles?
ENDEAVOUR (garble) there's no cloud now.
CAPCOM You did see -
ENDEAVOUR You could until just a few minutes ago and then the particles dissipated rather quickly and now I don't see any particles out that window.
CAPCOM Roger. We copy.
CAPCOM Al. Another bulletin from the lunar surface. The fellows have been back at the LM for sometime and working again on the ALSEP and the problems they had with the drill they're trying to catch up with now. And yesterday they got in one of the heat sensors and then had trouble finding the time to get in the second one. But they did get the second one in today and I guess now they're going to go after the core drill sample.
ENDEAVOUR Sounds like they're pretty busy down there, Carl.
CAPCOM Yes, they are having a good time there, all right.
ENDEAVOUR Well, good for them. I'm having a hard time keeping my lobster bisque in the bag up here.
CAPCOM Hey that sounds like a tough life you've got there?

END OF TAPE

CAPCOM I just stopped to look at the clock, Al, and I see that the flow photos are coming up on us almost immediately, if you'd like to take them.

ENDEAVOUR Rog.

CAPCOM As I look at the flight plan, I had that marked at 148 hours and 0 minutes. They must have given you a 5 minute pad there. As I see your position on the moon, you've got a while before you get there. Is that correct?

ENDEAVOUR Right, Karl. That's the way it looks to me.

CAPCOM I have you coming up on Hadley, right - well, you just passed Hadley, I guess.

ENDEAVOUR Yeh, that's right. I'm just going over Archimedes right now.

CAPCOM Righto.

ENDEAVOUR Karl, Endeavour. Just for your information at present time I'm right over Timocharis and Lambert's coming up on - just to the south of me. With Lambert are a very subdued ring just to the south of Lambert. And the photos I want to take are over around the area of Mt. La Hire and La Hire Rilles, a little bit west of Lambert.

CAPCOM We copy that.

ENDEAVOUR And as a matter of fact I have - Mt. La Hire seems to be in view now and looks like I'm heading right in it.

CAPCOM Hey, as I look at the map here, it looks like about 3 hills with a crater in the top of each. Look like volcanoes here although this map is lousy from that point of view. What do they look like to you?

ENDEAVOUR Well, I can see they're a chain of hills, ridges, and I can't see much more than that here right now.

CAPCOM Rog.

ENDEAVOUR Okay, Karl, if you're following on the map, I'm right south of the intersection of the La Hire Rilles and the Wrinkle Ridge that runs off to the northwest there just by Mt. La Hire. In fact I'm directly over Mt. La Hire now and it looks like there's a volcano in - or not a volcano but a crater in the top of the western most hill.

CAPCOM Roger.

ENDEAVOUR And I'm starting to take pictures to the west of them.

CAPCOM We copy.

END OF TAPE

CAPCOM Al, can you clarify a little more exactly where you're photographing. I see a wrinkle ridge running northwest toward Caroline Herschel from the LaHire Rille. So this is where I guess you're working. Is that correct?

ENDEAVOUR Negative. That's the large wrinkle ridge running off toward C. Herschel. No, I'm working directly west of LaHire Rille in that open area out there. Say on a line between Euler and Hase.

CAPCOM Roger. I copy.

ENDEAVOUR And there's nothing particularly significant that you can see on the map there. It's just that LaHire Rille seems to be associated with a lot of those flows and the flows - there are so many of them and they're so overlapping and intermingling unless you want to get some general pictures of those flows coming out of LaHire.

CAPCOM Roger. That sounds like a very interesting region. Then I see over by Diophantus there you've got some very prominant rilles at the present time that probably are just on the terminator aren't they?

ENDEAVOUR Yes, Karl. I'm beyond the terminator now.

CAPCOM Next time you get the flight plan in hand, let me give you the T start for this zodiacal light photography.

ENDEAVOUR Okay. Go ahead.

CAPCOM Okay. 148:34:26 is the zodiacal light photo pad.

ENDEAVOUR Understand, 148:34:26.

CAPCOM That's affirmative.

CAPCOM Say again, Endeavour.

ENDEAVOUR Go ahead.

CAPCOM Disregard, Al. I thought I headd you call and it was just something else in the background, I guess.

CAPCOM Jim is busy digging trenches there by the LM and he just about dug a hole big enough to build a swimming pool in. He did a good job.

CAPCOM Can you see as far south as the Carpathian Mountains, Al?

ENDEAVOUR That's negative, Karl. I've been - I'm beyond the terminator now in total darkness.

CAPCOM Right.

CAPCOM If you - if your orbit ever brings you far enough south to look at those Carpathian Mountains I should think that would be pretty interesting. Well, you probably know better than I, I guess. That's probably an overflow of Procellarum into Imbrium there. Probably sort of - if that's true it should have the appearance of

APOLLO 15 MISSION COMMENTARY, 8/1/71, 12:44 CDT, 148:10 GET, CM90/2

CAPCOM the front edge of a lava flow although it is a tremendous thing.

END OF TAPE

APOLLO 15 MISSION COMMENTAY, 8/1/71, CDT 1:04, GET 148:30, CM 91/1

CAPCOM Endeavour, this is Houston. The Rover boys have finished their task, most of their tasks with the ALSEP, and they are just now beginning INGRESS into the LM. Dave managed to get the Core Drill completely in, and although he hasn't pulled it out yet, he'll pull it out on the next EVA. The time to set the mission timer or to set the countdown for the zodiacal light photos is going to be in about one minute. And, the word down here is that all of your systems are go, everything is looking super.

ENDEAVOUR Roger, Karl. Thank you very much. See you on the other side. And, if you'll check my DSKY I got the time count down there too.

CAPCOM Very good.

ENDEAVOUR And I'm even managing to finish my lunch, too. Thank you.

CAPCOM That is a soft life up there, when you get a chance to finish your lunch.

ENDEAVOUR You better believe it. Some times it's not so easy.

CAPCOM I can believe it.

END OF TAPE

CAPCOM Endeavour, Houston. Over.
CAPCOM Endeavour, Houston. How do you read?
CAPCOM Endeavour, Houston. How do you read?
CAPCOM Endeavour, Houston. How do you read?
CAPCOM Endeavour, Houston. How do you read?
ENDEAVOUR Fine Houston. Endeavour loud and clear and I've got you locked up now.
CAPCOM Roger. I thought you were trying to tell us something.
ENDEAVOUR Not trying to tell you a thing, Bobby.
CAPCOM And Al; this is Houston. If you've got a moment we've got the usual number of little updates to give you.
ENDEAVOUR Go right ahead, sir. For a change, I'm ready to copy.
CAPCOM Okay. First of all; we're going to cancel a VHF comm check at 149 37. Your buddies just got into the LM down there and we don't think they'll be ready and we won't push them at this time on that.
ENDEAVOUR Okay. Understand.
CAPCOM And the second one is it looks like we'll be delaying your mapping camera business at 150 10 in the Flight Plan and we'll get back to you later on exactly what we'll be doing and when on that. Now if you'll turn to 151 hours; we have a mapping camera photo pad for you.
ENDEAVOUR Do you mean a Pan Camera Photo Pad.
CAPCOM Negative. It says MAP.
ENDEAVOUR AT 151?
CAPCOM Standby.
CAPCOM Okay Al. A little explanation. It's a photo pad I'm due to read you at 150 and 10. It's from a little Black Bear and it happens that the pass and all that will be taken place on the 151 hour Frame; so at the 150 and 10 you'll find the little squares for it.
ENDEAVOUR Okay. I'm with you. Yeah; when you call out a time like that; that's the time I go to the Flight Plan.
CAPCOM Roger. I thought that's what you should do, so I guess I was wrong. Okay. T START 151 09-----
ENDEAVOUR Okay, 150 plus 10?
CAPCOM Roger. Okay. T START 151 09 22. T STOP 152 09 01. And a little note that said at T START.
ENDEAVOUR Roger. Understand.
CAPCOM (garbled)
ENDEAVOUR Go ahead with the rest of the pad Bob.
CAPCOM Okay. At T START mapping image motion increase Talk Back Barber Pole plus 4. At 151 52 00 Mapping Camera image motion increase Talk Back Barber Pole. And then I have a Pan Camera photo pad, if you're ready to copy that.
ENDEAVOUR Okay. Let's get this mapping camera straightened out first. A, T START is 151 09 22. T STOP 152 09 01. At T START though, image motion increased to BARBER POLE plus 4;

ENDEAVOUR --- at 151 52 00 image motion increased to BARBER POLE.

CAPCOM Roger. And this Pan Camera is the one that is 151 03 in the Flight Plan.

ENDEAVOUR Roger. Go.

CAPCOM Okay. It says T START 151 13 13. T STOP 151 37 to 01. The next Pan Camera Pad will voiced up next rev. Over.

ENDEAVOUR Okay, Bob. Understand. T START is 151 13 13; T STOP 151 37 01.

CAPCOM Roger.

END OF TAPE

CAPCOM Endeavour, Houston. Over.
ENDEAVOUR Go ahead Houston, Endeavour.
CAPCOM Roger. When you've got a moment. We've got a few questions the king would like to have asked of you concerning your full activities so far.
ENDEAVOUR Roger, go ahead.
CAPCOM Okay. Hey Al, Vance here. If you've got a pencil and paper and I'll let you right these things down. Should take about 5 minutes.
ENDEAVOUR Okay, just a second.
ENDEAVOUR Okay, Vance, go ahead.
CAPCOM Okay. These are going to all refer to your visual sighting targets and well the first one is B 1B Tsiolkovsky. You don't need to pull out the book. Just but I'll reference them to pages in the book. First question, first comment is. Would you mark area on, in your book on the central peak where you saw Layering and when you get back we can look at it.
ENDEAVOUR Okay, got that one. Go ahead.
CAPCOM Okay, you spoke of a crater on the north-east side of Tsiolkovsky's rim and you said it had a fault line Could you mark that on your map also?
ENDEAVOUR Okay. I think I already have, but I'll double check.
CAPCOM Okay. Next, referring to the rim of Tsiolkovsky, you know the famous sections that appear to be moved inward and outward. The question is does it appear to you that the west segment of the wall moved inward or did the northwest segment move outward?
ENDEAVOUR I think it's just the other way around, Vance. I'll check it again and mark it on the map next time by, but as I recall I think the west section looks like it moved westward.
CAPCOM Okay. Next, and this would be the 1A, question 2. We'd just like to have you make sure that you take a look at that one.
ENDEAVOUR Okay. What's the title on 1A?
CAPCOM Okay that's Tsiolkovsky also. Question 2.
ENDEAVOUR Oh I see, yes, okay. Yes.
CAPCOM Okay going to V2. Refering to Picard, you talked about the layering on Picard wall. Do the layers have a uniform thickness and any estimate of how thick the layers are?
ENDEAVOUR Yes.
CAPCOM You might speak of the thickness of the layers in terms of the total depth of the crater.
ENDEAVOUR In terms of the depth of the crater or in terms of the diameter of the crater?
CAPCOM Well either way most convenient with you.

APOLLO 15 MISSION COMMENTARY 8/1/71 222 CDT 149:48 GET CM93/2

ENDEAVOUR Okay that's just a little difficult to do because the layering is, most of the layering is pretty thin I would say maybe 1/20 of the thickness or 1/20 of the depth of the crater and very small in comparison with the total diameter. I'd say maybe 1 percent thickness layer as compared to the diameter.

CAPCOM Okay.

END OF TAPE

ENDEAVOUR Okay, going to V5. This is Littrow.

CAPCOM A1, you mentioned the cinder cones and it's just some curiosity on the relative size of these cinder cones. And in judging the size, it's 12 kilometers between each line on your V5 photo. And while we're at it, are the cinder cones fairly evenly distributed or are they concentrated in spots on this darkest unit.

ENDEAVOUR They're concentrated in spots on the darkest unit. And they seem to be concentrated in localized areas also within the darker units, it's be a relatively high density of these small cones. And then a few scattered ones you know in the outlying areas but I would say they were concentrated within the darker areas, more on the lowland side you know in the valleys and in what looks like the lower areas and within concentrations of cinder cones there seems to be one locus of major activity, one locus of greatest number of cones and they thin out beyond that.

CAPCOM Okay. May be you could mark that on your map where you see these concentrations.

ENDEAVOUR Yeh, I can do that but I think the pictures would be better, man, because the cinder cones are much smaller than the definition in the picture.

CAPCOM Okay. And I'll give you one more V8 and that's the landing site. Just like to make sure you try to get an opinion of questions 1 and 2 in the age relationship also on that question we asked earlier about Aristillus and Autolycus and that's all I'll give you right now.

ENDEAVOUR Yeh. Okay, Vance, I'm over the landing site now and that unit up along the western edge of the front there to the northeast of the landing site very definitely looks like a flow unit that flowed along or parallel to the base of the front.

CAPCOM Okay. Copy that. I guess you got some other stuff coming up.

ENDEAVOUR (garlbe) Go.

CAPCOM Okay, that's about it A1. I'll turn you back to Bob and do some things to mull over.

ENDEAVOUR Okay, Vance, thank you much.

CAPCOM Righto.

CAPCOM Okay, A1. We'd like the high gain antenna to AUTO and when you've got a moment, we'll pass you up a TEI 45 pad but I guess there's no big rush on that.

ENDEAVOUR Okay. And incidentally on this mapping camera pass, you started that block at laser altimeter ON. Do you want that to start at - in the covers opening or do you want me to go ahead and extend the camera now?

CAPCOM We had a pad that started at mapping camera covers open and they explicitly took that one away and gave me one that started laser altimeter ON. So I presume they want the first two lines done.

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 149:58 CDT 2:32 CM94/2

ENDEAVOUR Okay. Well, I'm going to go ahead and open the covers and extend the camera then. Okay, camera's extending.

CAPCOM All right.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 150:08 CDT 2:42 CM95/1

CAPCOM And Endeavour, Houston. Over.

ENDEAVOUR Houston, Endeavour. Go ahead.

CAPCOM Roger. At your convenience, we'll take POO and ACCEPT and send you up a state vector. And, we need accept, and we'll send you a state vector and clock-up date. And, I got a TEI 45 pad at your convenience.

ENDEAVOUR Okay, Bob. Ready for both.

CAPCOM Okay, we're talking to you and I've got the TEI 45, the SPS G and N 3 7 2 6 4 plus 0 6 0 plus 1 0 0 1 6 6 3 8 5 8 3 2 plus 2 8 3 2 6 plus 0 2 9 0 1 minus 0 0 7 8 2 180 129 009 rest of the pad is NA, note 1 longitude at take plus 163.63, 2 assumes no plane change.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/1/71, CDT 2:52, GET 150:18, CM96/1

CAPCOM And ullage is 17 seconds-
ENDEAVOUR Roger. Understand.
CAPCOM Okay, Al. And ullage is 17 seconds 2 quads BRAVO and DELTA. Over.
ENDEAVOUR Okay, Houston. Understand. TEI 45 SPS G and N 37264 plus 060 plus 101 166 38 5832 plus 283 26 plus 029 01 minus 00 782 180 129 009, that's 2 jets for 17 seconds and you want quads B and D used. This assumes no plane change and longitude at TIG is 163.63.
CAPCOM Rober. And, the noun 48 values are plus 0 6 0 and plus 100. Is that right?
ENDEAVOUR Roger. Plus 100 plus 060 and plus 100.
CAPCOM Okay. Readback good.
CAPCOM And Endeavour, computer is yours again.
ENDEAVOUR Roger, Houston.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 150:28 CST 302 CM 97/1

CAPCOM And ENDEAVOUR, Houston. We'd like to terminate Battery A Charge at this time.
ENDEAVOUR Roger, Houston. Terminating A.
CAPCOM And ENDEAVOUR, as you go around the hill you're looking good. We'll look for you on the other side.
ENDEAVOUR Okay, Houston. See you on the other side.

END OF TAPE

CAPCOM Endeavour, Houston. How do you read?
ENDEAVOUR Houston, Endeavour. Loud and clear.
CAPCOM Okay. Ready for your usual updates?
ENDEAVOUR Okay. Go ahead.
CAPCOM Okay. Pan camera photo path for your 150 150 in the flight plan.
ENDEAVOUR Go ahead.
CAPCOM Okay. It's 151 57 14 for T start. T stop is 151 58 27. Over.
ENDEAVOUR Understand T start 151 57 14. T stop 151 58 27.
CAPCOM Roger, Al, and we got a couple of VHF's, we got a single VHF window for you if you want to try and get ahold of the crew down below. ALS is 151 51 25 and 152 04 15 for LOS. Over.
ENDEAVOUR Okay I understand ALS with LM is 151 51 and LOS is about 15 204.
CAPCOM Roger and if you'll give us cue just a little bit ahead we'll get them to go to voice so they can pick you up.
ENDEAVOUR Okay will do.
CAPCOM Okay and second item, Al. We're not going to put the mass spec boom out tonight because of the problems we've been having with the deployment. And so we want to delete the following operations of the flight plan. Starting on 152 10, 152 10. We'll delete the boom deployment at 152 10. We will delete the experiment and ION source on in stand by at 152 13 and we will delete the multiplier discriminator and ION source functions at 152 45. Over.
ENDEAVOUR Okay, Bob. I understand 152 11 delete mass speck deployment that whole line and then delete the line that turns the experiment on at 152 13 and then at 152 45 delete the multiplier discriminator steps.
CAPCOM Roger and going over to the next page at 153 36 we will delete gamma ray gain step shield off.
ENDEAVOUR I understand delete shield off at 153 36.
CAPCOM Roger. Then going down to 153 46 we'll delete shield on.
ENDEAVOUR I understand delete shield on at 153 46.
CAPCOM Roger. And a general question here, Al. We've been talking on the ground and we'd appreciate any comments on the general photo results, you been having any difficulties or problems you've been experiencing in the general photographic work both gegenschein and zodiacal light type and surface type. So far we've generally assumed that negtive reporting was meant that everything was going well. Is that right?
ENDEAVOUR Hello Houston, Endeavour.

CAPCOM Yes, read you loud and clear, Al.
ENDEAVOUR Okay. You went away on me there. - - (garble) question, Bob.
CAPCOM Stand by, Al.
CAPCOM Al, how do you read, Houston?
ENDEAVOUR Okay. I read you loud and clear.
CAPCOM Okay. Did you copy my question there on comments concerning your procedures on the photo, general gegenschein and zodiacal light and surface?
ENDEAVOUR You say the question is do I have any questions on it?
CAPCOM Roger. My question was did you copy my question?
ENDEAVOUR Why don't we start from scratch again, Bob. You were cut there quite a bit when you first started talking and it sounds like I'm reading you okay now. So why we just start all over again.
CAPCOM Yes, I think we have a (garble) problem with the LM, which affected us. Okay. People on the ground have generally be assuming that negative reporting on any difficulties with the command module photo procedures meant that everything was going along swingingly. Is that a correct assumption?
ENDEAVOUR That is a correct assumption, right.
CAPCOM Okay. We'll continue to make that assumption. Thank you.
ENDEAVOUR Yes, so far everything, particularly the aociacal light and the gegenschein calibration. That sort of thing has been going just as per the flight plan.
CAPCOM Beautiful.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 151:46 CST 16:21 CM 99/1

ENDEAVOUR Houston, ENDEAVOUR.
CAPCOM Go ahead, ENDEAVOUR
ENDEAVOUR Okay Bob. Now we are going to try to give a call down to FALCON.
CAPCOM Okay. (garbled) Go ahead and I'll, you won't get them right off, but I'll tell them to go to voice.
ENDEAVOUR Okay. And I'm going to call them on simplex A.
CAPCOM Understand Simplex Alpha.
ENDEAVOUR Affirm.
FALCON Hello.
ENDEAVOUR Hello Falcon. This is Endeavour.
ENDEAVOUR Hello Falcon. This is Endeavour.
ENDEAVOUR Hello Falcon. Endeavour.
ENDEAVOUR Hello there Falcon. This is Endeavour.
ENDEAVOUR Hello Falcon. Endeavour.
FALCON I'm doing fine. How are you doing?
ENDEAVOUR How do you read me now, Falcon?
ENDEAVOUR Hello Falcon. This is Endeavour.

END OF TAPE

ENDEAVOUR Hello, Falcon, this is Endeavour.
ENDEAVOUR You're a little broken too Dave, how's it going? Okay, I'm just about over head now.
CAPCOM Endeavour you're about 30 seconds from your pan camera.
ENDEAVOUR Roger. Oh, getting lots and lots of good data. How about you?
ENDEAVOUR Very good.
ENDEAVOUR Pretty spectacular up beside that mountain I got. Good.
FALCON I hope I got some good ones for you too.
ENDEAVOUR Yeah, I bet it does. Oh you can collect you another bunch of rocks tomorrow and bring them home. Yes, we'll be pleased with whatever you bring home. You forget something, Jim? Don't mind if I use it do you? Well, I haven't had a chance to use it yet, but, I might tonight. Yes, that's true. I guess a little (garble). How are they holding up? Understand the Rover's doing fine. Sounds great.
CAPCOM Okay, Al, pan camera OFF, please.
ENDEAVOUR Okay.
ENDEAVOUR Falcon, you still there?
ENDEAVOUR Falcon, can you read Endeavour now? (garble)
CAPCOM Endeavour, Houston, we still don't have the pan camera OFF, as far as we can see.
ENDEAVOUR Roger. Power coming off now BOB.
CAPCOM Okay.
ENDEAVOUR Sorry about that I didn't get it turned off quite as quick as I wanted.
CAPCOM I guess that's what Vince was trying to tell me.
ENDEAVOUR Roger. Why don't you stand by on your call before?
CAPCOM Okay. Thank you. Hey, and Al, we'd like to get high gain antenna AUTO from you. And, sometime at your convenience you might send us down a film usage pad.
ENDEAVOUR Okay. I'll set, I compile that on the way around the next time.
CAPCOM Roger. Thank you.
CAPCOM And Endeavour, Houston. Over.
ENDEAVOUR Houston, Endeavour. Go ahead.
CAPCOM Roger. We'd also like when you turn OFF the mapping camera in the next few minutes, we'd like you to delay turning off the laser altimeter and closing the covers until we give you a call from the ground. We'd like to look at the laser altimeter on with the mapping camera OFF for a few minutes.
ENDEAVOUR Okay. Will do.
CAPCOM Thank you.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 152:06 CDT 16:40 CM101/1

CAPCOM Al, Houston. Over.
ENDEAVOUR Houston, Endeavour. Go ahead.
CAPCOM Al, would you turn the laser OFF and we'll call you shortly and have you turn it back on.
ENDEAVOUR Okay, Vance, going off now.
CAPCOM Roger. Okay. We're ready for it back on. Thank you.
ENDEAVOUR Back on.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 152:16 CDT 16:50 CM 102/1

CAPCOM Endeavour, Houston.
ENDEAVOUR Houston, Endeavour. Go ahead.
CAPCOM Rog. We'd like to see the laser altimeter OFF at this time and you can follow up on the rest of those things per the flight plan closing - retracting the mapping camera, et cetera, and closing the cover.
ENDEAVOUR Okay, Houston, that should work.'
CAPCOM Okay and we'd also like you to verify if the gamma ray boom is out at the present time.
ENDEAVOUR That's negative. It's going out now.
CAPCOM Copy, thank you.
ENDEAVOUR Houston, Endeavour.
ENDEAVOUR Hello, Houston, Endeavour.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/1/71, 17:01 CDT, 152:27 GET, CM103/1

CAPCOM Endeavour, did you call Houston?
ENDEAVOUR Houston, Endeavour. Yes. I sure did, Bob.
CAPCOM Roger. I was talking to Jim and Dave. Go ahead.
ENDEAVOUR Okay. You still logging the Delta Ts on extend and retract.
CAPCOM Yes.
ENDEAVOUR I guess that means yes. Delta T and the gamma ray extend - -

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 GET 152:29 CS17:04 CM #104/1

ENDEAVOUR Well, I guess that means yes; so Delta P in the Gamma Ray extend was 2.37 and on the mapping camera and retract was 3 plus 32.
CAPCOM Roger copying, Al.
ENDEAVOUR Okay.
CAPCOM And Endeavour, Houston. We see you going around the corner. You're looking good to us; we'll see you on the other end.
ENDEAVOUR Okay Houston. See you on the other side.
CAPCOM Bye Bye.

END OF TAPE

CAPCOM Endeavour, Houston. Over.
ENDEAVOUR Hello, Houston. Endeavour.
CAPCOM Okay, Endeavour. We've got a couple of long sort of dissertations to read to you. One dissertation and two questions. So if you've got a minute let me know and I'll talk to you between bites of your supper.
ENDEAVOUR Okay. Go ahead.
CAPCOM Okay. It says here we observe the use of P30 for long periods of time and this appears to be degrading the P20 attitude calculations during narrow dead band camera activity. This is causing a slight increase in RCS usage. If you want to use P30, they're recommending you follow the following procedures. And you won't be doing any of it tonight obviously and I think we'll come up and let you copy them down tomorrow. This is just I guess to acquaint you with the problem and let you think about it tonight while you're sleeping. The procedures we're recommending when you use P30 as are follows: (1) reselect P20, that is, release P30 once every 30 minutes and allow the computer to integrate its state vector forward. This is about a 30 second dealy. And then number 2, do not input a PID time of more than 30 minutes into the future while you're in narrow dead band. Does that make sense to you?
ENDEAVOUR Yes. Keep talking.
CAPCOM Okay. As I say, we'll come back up and let you copy down some of those specific words again tomorrow before you get involved. The second long one concerns the clarification of mass spec behavior when it fouled up about 12 hours ago. And they're asking us to ask you the following questions to try and clarify what was going on. First of all, was the talkback ever 1/2 barberpole during the extend while attempting to recycle for retraction? Over.
ENDEAVOUR The answer to that one is no.
CAPCOM Okay. Two, was the barberpole indication a 1/2 or between a 1/2 and 3/4 of full during retract?
ENDEAVOUR Don't know how to answer that one, Bob, because the barberpole itself is to get a full barberpole, you only get about 2/3.
CAPCOM Okay. Understand. Did the talkback change state after approximately - -
ENDEAVOUR Yes. I was getting about half of that.
CAPCOM Okay. You're getting about half of the normal 2/3.
ENDEAVOUR That's correct.
CAPCOM Okay. Third question, did the talkback change state after approximately 3 minutes or was it a half barberpole all the time during the retraction?

ENDEAVOUR I can't answer that one specifically since I didn't sit there and watch the barberpole all the time.

CAPCOM Okay.

ENDEAVOUR However, I did - when I went back to the mass spec to cycle the thing to deploy and retract to see if there was any possibility of the cabling out there getting changed, that was when I noticed that it went to half barberpole on the retract side.

CAPCOM Okay. Copy that. And did you - did you ever tap the barberpole when it was half barberpole.

ENDEAVOUR I'm sorry. Say again.

CAPCOM Did you ever tap the talkback to see if you could make it flip over?

ENDEAVOUR I noticed a couple of times when I went to retract, the barberpole would go - it would go full barberole and then very slowly slip down to about half barberpole and stay there.

CAPCOM Okay. But did you tap the talkback at any time? Tap.

ENDEAVOUR Oh, did I tap it. Negative. Negative.

CAPCOM Okay. And during the recycling of the switch can you estimate the maximum time you were in the extend position?

ENDEAVOUR I'm not sure I understand your question. You mean the maximum time I was in the extend position during the retract cycle?

CAPCOM Stand by.

CAPCOM Al, what's wanted is the total accumulative time that you went back to the extend position and back and forth while you were trying to recycle it in order to free it. In other words, if you went back to 30 seconds and then to retract and then back to extend for 40 seconds et cetera. What was the total accumulated time or an estimate thereof that you were in the extend position.

ENDEAVOUR Okay, Bob. I would estimate that I was in the extend position a total of about 15 seconds.

CAPCOM Okay. And what was the longest single time?

ENDEAVOUR Oh, probably 4 seconds.

CAPCOM Okay. A couple of other small ones, Al. Reminding you that we - we're deleting the cabin pumpup from the presleep checklist and a reminder when we get to the presleep checklist and the crew status would you please remember to give us the PRDs. We just didn't get that from the crew on the ground and the surgeons were very anxious to get your's at least and we also I guess are due some P52 torquing angles.

ENDEAVOUR Okay. He wants my PRD even though it's the one that's not working, huh?

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/1/71 1807 CDT 153:31 GET 106/1

ENDEAVOUR Okay. He wants my PRD even though it's the one that's not working?
CAPCOM Well anything is better than nothing.
ENDEAVOUR I guess your right. Here's some torquing angles for you, Bob. (garble) stars 41 and 43 now 05 was plus 4 balls one. Now 93 was plus 00028 minus 00031 plus all zeros. And it was torqued out at 152 46 00.
CAPCOM Roger. Copy. 01 28 31 all balls 152 46 00.
ENDEAVOUR (garble) I've got a film update for you, there, Bob, (garble) dispenser.
CAPCOM Go ahead.
ENDEAVOUR Okay. The magazines used today and the exposures, these are a total of frame readings too. Magazine-Q is reading 31 magazine-F is reading 111, Magazine-T is 37 and that one has been changed out for uniform for you, uniform and uniform is now reading 31.
CAPCOM Roger. Copy, Al.

END OF TAPE

APOLLO 15 MISSION COMMENTARY, 8/1/71 CDT 18:15 GET 153:41 CM 107/1

ENDEAVOUR Houston, Endeavour.
CAPCOM Go ahead, Endeavour.
CAPCOM Endeavour, Houston. Go ahead.
ENDEAVOUR Okay, Houston. I got your status reports for you, if you're ready to copy.
CAPCOM All righty.
ENDEAVOUR Okay. Crew status, no medication. Everthing seems to be fine. PRD is 2 3 1 6 3.
CAPCOM Go.
ENDEAVOUR And the onboard readouts battery C 37, pyro BAT A 37, pyro BAT B 37, RCS A 70, B 68, C 69 and D 70.
CAPCOM Roger. Copy all that stuff, Al. And, Al, we'd like one final confirmation. And that is, you've got narrow reaquire and pitch plus 25 yah 185. Over.
ENDEAVOUR That's verified.
CAPCOM Okay.
CAPCOM Okay, Al. That's all we've got. You can turn the light out and go to sleep.
ENDEAVOUR Okay, I'll do just that.
CAPCOM Roger, roger.

END OF TAPE

CAPCOM Endeavour, this is the planet Earth calling. We'll start off the day this morning with a little bit of wake up music for you and if you appreciate our selection, you may respond with an E memory dump, if you are able to hear me at the present time.

MUSIC

CAPCOM Endeavour, this is the planet Earth calling this morning. We'll start off with a little bit of wake up music and then we'll get into the day's activities. If you are awake enough to hear this, you can express your appreciation for our fine music by sending us down an E memory dump.

CAPCOM Endeavour, this is Houston. How do you read now?

CAPCOM Endeavour, this is Houston. If you are reading give us ACCEPT and we'll send up a state vector.

ENDEAVOUR Hello to you, (garble) Endeavour.

CAPCOM Good morning, Al. How's the morning up there?

ENDEAVOUR Well, I'll let you know when I wake up, Karl. I had another very peaceful evening.

CAPCOM Glad to hear it.

CAPCOM We're ready for high gain AUTO, Endeavour. And I have - and I have a flight plan update, the most important one being that at 162:06 in about 3 minutes, we will be - delete the gamma ray gainstep shield off.

ENDEAVOUR Okay, Karl. Understand, let me get the flight plan out here. Okay, gamma ray gainstep shield off's been deleted.

CAPCOM Roger. And I have mapping camera photo pad and some further flight plan updates when you are ready to copy.

ENDEAVOUR Okay, go ahead.

CAPCOM Mapping camera photo pad down there at 162:55. T start 162:59:30, T stop 163:59:11.

ENDEAVOUR Okay, understand. Mapping camera photo pad T start 162:59:30. T stop 163:59:11.

CAPCOM That's correct and further flight plan changes, we have very few today. At 162:16 we can delete the gamma ray gainstep shield on.

ENDEAVOUR Understand. 162:16 delete gamma ray gainstep shield on.

CAPCOM Roger, over on 163:10. We add map camera image motion increase, with appropriate barber pole comment, increase and then leave it on. Increase/on would be a better way of reading that to you.

ENDEAVOUR Okay, understand. 163:10 you want the image motion increase to barberpole on.

CAPCOM Roger. And at 163:40 we can add mapping camera image motion increase on. And also gamma ray gainstep shield off.

ENDEAVOUR Understand. 163:40 you want image motion increase/on, do you want that - how many steps past barberpole do you want it?

CAPCOM Okay, Al. I missed the beat there, the one at 163:10 was talkback barberpole plus 4 steps at that time. And at 63:40, take it to talkback barberpole and leave it there. Did that come through okay?

ENDEAVOUR Okay, understand. The one at 163:10 is image motion increase to barberpole plus 4 and then on. And then at 163:40 is increase to barberpole on, and gamma ray gainstep shield on.

CAPCOM Roger, 163:40 that was Shield off O-F-F, and at 163:50, the gamma ray gainstep will go shield ON shield O-N.

ENDEAVOUR Okay, understand 163:40 shield is OFF and 163:50 shield goes ON.

CAPCOM Roger, and that's the end of the mapping camera and the Flight Plan update.

ENDEAVOUR Rog.

CAPCOM The computer is yours, Al, and I have consumables update, if you would like it.

ENDEAVOUR Okay, go ahead.

CAPCOM GET 162 hours 0 minutes, RCS total 60, quad A 60, 60 59 61, hydrogen tanks 65 64 46, oxygen tanks 71 74 58.

ENDEAVOUR Understand. RCS total is 60, that's with quads 60 60 59 61, H2 tanks 65 64 46 and 02 tanks 71 74 58.

CAPCOM That's correct.

ENDEAVOUR And where do we stand on the RCS budget, Karl, do you know?

CAPCOM Stand by on that Al, we'll give you a good report in a few minutes.

END OF TAPE

CAPCOM Endeavour, this is Houston. On your RCS fuel, you are running roughly 6 percent below flight plan values and you're still running roughly 15 percent above the red line. Quad Charlie is the lowest, the most critical quad. But, there's no big deal at the present time in any of them. Quad Charlie, incidentally is 10 percent above the red.

ENDEAVOUR (garble)

CAPCOM Quad Charlie, incidentally is 10 percent above the red line.

ENDEAVOUR Okay. Sounds fine.

CAPCOM Endeavour, this is Houston. The latest information from Hadley Rille. Is, that the crew is awake and about one hour from EGRESS time. This EVA #3 has been shortened in length some what to about 4 1/2 hours, in order to get our time line back on time, for the nominal ascent. You can expect that you'll have some company, later this afternoon.

ENDEAVOUR Very good, Karl. And, let's see, I guess I can give you a crew status report this morning.

CAPCOM Fire away.

ENDEAVOUR Okay. I've got 7 1/2 hours of sleep in one period, no medication. The PRD is 23164.

CAPCOM We copy Al.

ENDEAVOUR Houston, Endeavour. If you're copying the DSKY, the gyro torque angles are open.

CAPCOM Roger. We've copied them, thank you.

CAPCOM Endeavour, this is Houston. Couple of quick questions. First of all the surgeons see something of a difference in your heart rate between the 2 nights sleep and just out of medical curiosity, they'd like to have your subjective evaluation. Did you sleep better last night than the night before, or vice versa?

ENDEAVOUR Gee, I guess subjectively, I slept pretty well both nights.

CAPCOM Just about equal in other words?

CAPCOM Okay, And

ENDEAVOUR I think so or maybe I slept a little better last night.

SPEAKER Last night

CAPCOM Glad to hear that. You're confounding their theories. On,-

END OF TAPE

ENDEAVOUR On ---
CAPCOM Al, we'd like to have you verify tape motion at LOS; and if it isn't, start the tape running for us.
ENDEAVOUR Roger.
CAPCOM And, A, on this T 30 business; I see something of a long comment they made to you last night. Is everything on that clear?
ENDEAVOUR A, Roger Karl. I think so. I guess for the storage areas; we'll stay away from using the Pocket T 30 as much as possible, and when we do use it, especially when we're in deadband we won't let it run more than 30 minutes.
CAPCOM Okay. Everybody down here thinks that's a great philosophy. Good.
ENDEAVOUR And, Houston, Endeavour. There were a couple of questions on the Flight Plan. I guess I'm wondering what we're going to do about the Mass Spec today. We got some things in here. Of course, we didn't use it last night, so there are I guess a few steps that you're to delete.
CAPCOM Right'O. We don't intend to use the Mass Spec today so you can delete these particular steps about retracting or about extending the Boom, etc.; which just are not --- that was it. Delete any action on the Mass Spec.
ENDEAVOUR Okay.
ENDEAVOUR Okay Karl. Over.
CAPCOM Endeavour, this is Houston. As you go around the corner all your systems look to be in good shape.
ENDEAVOUR Roger, Houston. See you at the other side.

END OF TAPE

CAPCOM Endeavour, we'd like to have narrow beam on the high gain.

ENDEAVOUR Okay, Houston. Got it.

CAPCOM Very good, Al. You're coming through loud and clear. What's new up there?

ENDEAVOUR Just had a very nice breakfast and ready for today's activities.

CAPCOM Excellent.

CAPCOM Our major business on this rev is to get squared away for plane change and as soon as we have good comm I want to review with you the changes we need in your SPS burn cue card.

ENDEAVOUR Okay. Stand by.

CAPCOM Endeavour, this is Houston. I guess we can go ahead with the plane change data any time you're ready to copy.

ENDEAVOUR Okay, Karl. Stand by one.

CAPCOM Let's start out with the cue card if that's okay with you.

ENDEAVOUR Okay, Karl. Go ahead.

CAPCOM Okey-doke. As you know this burn is going to a fairly normal burn on bank B only. The only really special thing to remember is to close that SPS and pilot valve main B at 2 minutes before the burn. To make sure that we've got all the verifications and everything else straight, let's go back into the cue card and do some verifying right after you cycle the cyro fans and before you go into your Delta V check. And at that point, we've got first of all, EMS function off, verify that before you put in the EMS breakers. Second is the circuit breakers, EMS main A and B both of them closed. Third step there is to verify that the circuit breakers group 5 both of them are closed. And the fourth step there is to verify at this point that both of your SPS pilot valve circuit breakers are open. The only other change to the front side of your cue card is the trivial point down below when you're checking your stabilization control circuit breaker on panel 8 that there's only 10 of them closed at this time instead of 12.

CAPCOM Right. That's the stabilization control and SPS breakers.

ENDEAVOUR (garbled) Understand. Yes. The SPS burn is going to be a nominal main B burn - main B only burn but to get set up for it we want to check - after cycle cryo fans check that EMS is off, get two EMS circuit breakers in, check that the group 5 circuit breakers are closed, and check that the SPS pilot valves both are open at that time. And then down where it says CB stability control panel 8 and SPS 10 or 12, we'll make that 10.

CAPCOM Roger. And then over there on the

CAPCOM back of the card. Would you give us high gain auto right now, Al.

ENDEAVOUR Okay.

CAPCOM And on the back side of the card at minus 2 minutes we have the Delta V - just above the Delta V thrust we want to put in the circuit breaker SPS pilot valve main B closed at that point. Followed immediately by your Delta V thrust switch which in this case is your B switch not your A switch. Cross out the A. Down below - -

ENDEAVOUR Understand.

CAPCOM Down below - -

ENDEAVOUR SPS pilot valve main B closed before Delta V thrust, B switch to on.

CAPCOM That's affirmative. And down below at plus 3 seconds you can cross out the Delta V thrust switch normal then since this is a single bank burn. And Al we'd like to have high gain antenna wide beam for about 5 seconds and then narrow.

CAPCOM And the final point in the checklist is in the cleanup down below, preferably after circuit breaker SPS pitch one and yaw one open. Let's get our circuit breakers cleaned up here. Let's put in circuit breaker SPS pilot valve main B open. Also circuit breakers EMS both of them open.

ENDEAVOUR Roger. Understand. In the cleanup about where CB SPS pitch one and yaw one are open, we'll pull CB SPS pilot valve main B open and CB EMS two open.

CAPCOM That's correct. And that - assuming that your cue card was clean to start with that should give you a good cue card not only for the plane change but also for any rescue maneuvers and also for the shaping burn.

ENDEAVOUR Roger. Understand.

CAPCOM I have - And I have the comments here on trimming your residuals if you're ready to copy those.

ENDEAVOUR Okay. Stand by.

ENDEAVOUR Okay. Go ahead.

CAPCOM Okay. The LOP C residuals. First of al, trim VGY to 0. - 0.2 feet per second - -

END OF TAPE

CAPCOM ZGY to 0. - 0.2 feet per second. Next and this is because our quad C - RCS is low and we're trying to conserve it in the trimming if you have a negative zgy roll 90 degrees counterclockwise and use your minus Z thrusters. If you have a positive ZGY roll 90 degrees clockwise, and use your minus Z thrusters. And one final comment here is during the burn we would like to keep the oxidizer flow valve in the decrease - decrease position.

ENDEAVOUR Understand you want the oxidizer flow valve in the decrease position.

CAPCOM Affirmative.

CAPCOM And did everything come through on the trim.

ENDEAVOUR Roger, Karl. You wanted to add to the - trim rules that we already have established for the 20 change. That if the residual is plus ZGY greater than 2/10 of a foot per second then we roll clockwise 90 degrees and use the minus Z thrusters. Otherwise the same as printed in the flight plan.

CAPCOM That's affirmative, Al.

ENDEAVOUR And also you want the PUGS valve in decrease.

CAPCOM That's affirmative. And the next - the next bit of information I have for you is the plain change path.

ENDEAVOUR Okay, go ahead.

CAPCOM Okay purpose PC FPS G&N 37202 plus 033, plus 107 165 11 3196 minus 00092 plus 03303 plus 00184 0 roll 0 pitch, 0 yaw, 0644, say that again for HA 00644, HP is plus 00533 03309, 018 03191 36 0128 392 the rest is NA. The set stars are Denub and vega 189 256 330, ullage, we would like two quads B and D quads 17 seconds, 17 seconds and that's all.

ENDEAVOUR Okay, understand. This is flight change 1 SPS G&N 37202 plus 033, plus 107 165 11 3196 minus 00092 plus 03303 plus 00184, roll, pitch and yaw are all 0's. 00644 plus 00533 03309 018 03191 36 0128 392 vega and Denub are set stars and 189256 330. Ullage is two jets 17 seconds using quads B and D.

CAPCOM That's all correct.

CAPCOM Al, we'd like to verify that the oxidizer flow valve was in the decrease position at the end of the last burn and has been there since then.

ENDEAVOUR Negative, Karl. It was in normal at the end of the last burn which was circularization burn and it was - it has been in normal since then. It's in decrease now, I put it there after you called it out of the pad.

CAPCOM Thank you, Al.

CAPCOM Just a reminder, Al. Since I've been reading a lot of things to you about the pan camera mode stand by power on.

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 16324 CDT 358 CM112/2

ENDEAVOUR Rog, it's there now.
CAPCOM And I have a TEI 52 pad anytime your ready to copy.
ENDEAVOUR Okay, go ahead.
CAPCOM TEI 52 SPS G&N 36003 plus 060 plus 107 180 315188 plus 30300 minus 08939 minus 02310 180 088 346 the rest is NA. We have two jets for 17 seconds with the B and D quads bravo and delta quads the Lambda at tigs is plus 177.77 and it is assumes LOPC and ascent refsmat.
ENDEAVOUR Roger, understand TEI 52 SPS G&N 36003 plus 060 plus 107 180 315188 plus 30300 minus 08939 minus 02310 180 088 346 2 jet 17 seconds using quads B and D. And Lambda tig is plus 177.77 and the pad assumes the plain change and ascent refsmat.
CAPCOM That's all correct.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 CST4:08 GET163:34 CM113/1

ENDEAVOUR That assumes the plane change in ascent respet.
CAPCOM That's all correct.
CAPCOM Endeavour, we're ready for pan camera power off now.
ENDEAVOUR Roger, power is off.
CAPCOM Endeavour, a reminder on the gamma ray gain step. We need the shield off at this point.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 163:44 CDT 4:18 CM114/1

CAPCOM Endeavour, this is Houston. We have one small change in our setup for the plane change burn and that is we would like to leave the oxidizer utilization valve on . . in the normal position. We'd like it normal instead of decrease as we previously told you.

ENDEAVOUR Okay, going normal on the (garble) valve.

CAPCOM Roger, and the boys on the surface have the TV tuned up for us now and we're getting some lovely landscape pictures at Hadley Delta, etc. Those hills there are just beautiful round, bare hills, a lot like the ones you see around San Francisco, it's a beautiful sight. They are just about loading up the Rover and getting ready to head off toward the south com . . first of all to the Rille for a quick visit and then off to the south complex.

ENDEAVOUR Rog, Karl, understand that, did you say they are going to cut it a little bit short today?

CAPCOM Right, they are going to cut it between one and two hours short because they got in . . they wanted to get their normal sleep today, and I guess they won't do quite so much exploration in between, but they still expect to get to the south complex, pardon me, that's the north complex.

ENDEAVOUR Rog, understand.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 16354 CDT 428 CM115/1

CAPCOM Endeavour, this is Houston. It's time to turn off the mapping camera.

CAPCOM Endeavour this is Houston. If you'll go POO now you'll have a shorter maneuver down and your maneuver to the P52 attitude. And if you'll give us accept we'll send up state vector and other burn information.

ENDEAVOUR Okay, Karl. You've got it POO and accept.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 CST4:37 GET164:03 CM116/1

CAPCOM Al, the computer is yours, you've got a state vector, a target REFSMMAT.

ENDEAVOUR Okay, Karl, thank you. And Houston, Endeavour, I've got the Sim Bay powered down now, and turning back on all the jets, turning on all the jets.

CAPCOM Roger, Al, we understand.

CAPCOM Endeavour, this is Houston you can expect us to give you a go, no go for LOI before LOS. That's right that's a go, no go for plane change, pardon me, I'm a little bit behind time, here. Before LOS and since your burn is so close to AOS, we'd like to give you a procedure here, so that we can lock up without your having to go over there to throw any switches. Can you copy it now?

ENDEAVOUR Rog, Karl, go ahead.

CAPCOM Okay, after LOS we'd like to have you put the high gain track to manual, and dial in pitch minus 10, yaw 251. When the high gain angle, when the high gain antenna meters read pitch minus 10 or yaw 251, then go to track and REACQ with narrow beam, then if your squelch is off, your high gain antenna acquisition will be indicated at AOS by loss of noise.

ENDEAVOUR Okay, understand you want me to position pitch minus 10 yaw to 251, go REACQ narrow and make sure the squelch is off.

CAPCOM That's affirmative.

CAPCOM Endeavour, this is Houston, you're go for plane change 1.

ENDEAVOUR Houston, Roger Endeavour, understand go.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 16413 CDT 447 CM117/1

ENDEAVOUR Okay Houston, Endeavour. I've got gyro torqueing angles up. You through copying them.

CAPCOM Endeavour, we've copied them. Thank you.

ENDEAVOUR Okay.

CAPCOM Endeavour, this is Houston. We're 2 minutes from LOS and all your systems look to be in good shape.

ENDEAVOUR Roger. Thank you, Karl.

END OF TAPE

ENDEAVOUR Okay, Houston I've got 1 minute and 45 seconds to the burn.
CAPCOM Roger Endeavour, Houston reads you loud and clear and we're standing by.
ENDEAVOUR Average g.
CAPCOM Roger.
ENDEAVOUR Ullage. Thrust on. Thrust off.
ENDEAVOUR Houston, Endeavour, if you're copying the DSKY you'll see residual as .2.2 and .3 so no trim.
CAPCOM We copy and concur Al, and it looks like a beautiful burn.
ENDEAVOUR Yes sir, it certainly does.

END OF TAPE

CAPCOM Al, if you'll give us accept we'll send up a lift-off REFSMMAT and a RLS update.

ENDEAVOUR Okay, Karl. And if your ready I'll give you the rest of the burn status report just the EMF and things like that.

CAPCOM Go ahead.

ENDEAVOUR Okay. Tig was on time and looked to me like the burn time was 18 seconds. Delta-VC was minus 10.6. Fuel is now 26.4, oxidizer is 26.2 and increase decrease is decrease is 25.

CAPCOM Thank you. We copy.

CAPCOM And Al, in case of confusion on that mass spec we do want the experiment switch on stand by.

ENDEAVOUR Oh, okay Karl. There must have been some confusion because I had scratched that off my flight plan. Okay going stand by.

CAPCOM Endeavour, Houston. The latest bulletin from Hadley Rille tells us that the crew, after spending an unusual amount of time at the LM trying to get back the core drill with which they were only partially successful are now moving across the lunar surface and their currently at Hadley Rille giving us some beautiful views of the Rille.

ENDEAVOUR Very good. How is the TV from there, Karl.

CAPCOM Our TV from down here is just beautiful.

ENDEAVOUR Good. Save a copy for me.

CAPCOM We sure will, Al.

CAPCOM Hey, Al, Vance says do you want us to put it on your EMF.

ENDEAVOUR Tell Vance he's got the wrong EMF I'm afraid. Sure would like it, though.

CAPCOM Righto.

ENDEAVOUR And you tell Vance I got cartoons on right now.

CAPCOM Say again.

ENDEAVOUR Just tell Vance I got cartoons on. He'll know.

CAPCOM Okay, Al.

CAPCOM Al, we'd like to have you stay in accept, but give us a VERB 33 enter.

CAPCOM Endeavour, this is Houston. We'd like to have the gamma ray gain step out 3 times, please.

ENDEAVOUR Rog, Karl gain step up 3 times.

CAPCOM Affirmative.

CAPCOM Al, you can go to block now. We've had some conflict in commands in that update to you and you got your LF - RLF update, but you didn't get the new refs map.

ENDEAVOUR Okay, Karl, understand.

CAPCOM Endeavour, this is Houston. Would you please give us accept.

ENDEAVOUR Okay, you've got it, Karl.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 165:33 CDT 6:07 CM120/1

CAPCOM Al, give us VERB 33 enter. And that should complete your REFSMMAT, and you can go to block.
ENDEAVOUR Okay. Okay, thank you sir.
CAPCOM Endeavour, we would like high gain auto.
ENDEAVOUR Auto.
CAPCOM Thank you.
CAPCOM Al, the medics told me that they can see that you are exercising per the flight plan, would you like to know what peak value you get?
CAPCOM Peak value on heart rate, that is.
ENDEAVOUR Yeah, I'd be interested in that, Karl.
CAPCOM Let's see how high you can work her up. It'd be good to really churn her up for a while.
CAPCOM Okay, they got you at about 100 beats per minute for a moment.
ENDEAVOUR Very good.
CAPCOM We record 116.
CAPCOM You made 120. Man you must be burning that thing up.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 165:43 CDT 6:17 CM121/1

CAPCOM Got you at 126.
CAPCOM They say that looked like a real good stretch of exercise there, Al. Should stack in good stead a couple of days from now.
ENDEAVOUR I sure hope so, Karl, been keeping it up just for that reason.
CAPCOM Very good.
ENDEAVOUR And I think it makes a difference in your whole outlook and the restful way that you can do this flight too, get a little exercise and a good night's sleep also.
CAPCOM Yep, you're probably right.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 165:53 CDT 6:27 CM122/1

CAPCOM Al, I have a REFSMMAT zero time for you when you have time to copy.
ENDEAVOUR Okay Karl, go ahead.
CAPCOM 171 37 18.89.
ENDEAVOUR Understand 171 37 1889.
CAPCOM That's affirmative.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 166:03 CDT 6:37 CM123/1

CAPCOM Al, we've got your angles and you can torque them.
ENDEAVOUR Okay, Karl. Torquing on the minute.

END OF TAPE

CAPCOM Endeavour, this is Houston, all of your systems are go as you go around the corner and I hope to have a science update for you on the next Rev. In the meantime, I can report that the x-ray data is beginning to show very clear patterns from highlands mare region. It looks as though we are going to, we are high in magnesium in the mare and high in aluminum in the highlands, which tends to confirm the Anorthitite theory for the highlands. It gets rather exciting when the data starts adding up like that. And the Laser altimeter has shown us that the back side of the moon is indeed further from the center of the moon than the front side. This has been a theory previously and now you seem to have proved it with good follow up data. Lots of things are beginning to fall into place, and what a mission, that's all we can say.

ENDEAVOUR Sounds pretty good so far, Karl. And I'm getting the simbay ready to have another shot of that.

CAPCOM Okay, we've been watching your manuvering there, have a good go at it.

ENDEAVOUR Okay, Karl.

CAPCOM And the rover boys at Hadley Rille have just had a tremendous session picking up all sorts of useful samples. The TV has been beautiful, the, all sorts of layering shows in the edge, in the rille walls and it's just very exciting.

ENDEAVOUR It sounds great.

END OF TAPE

CAPCOM Endeavour, this is Houston. How do you read?

CAPCOM Endeavour, this is Houston. How do you read?

CAPCOM Endeavour, this is Houston. How do you read?

ENDEAVOUR Hello, Houston, Endeavour. Loud and clear.

CAPCOM Roger. Hear you likewise, loud and clear.

CAPCOM Endeavour, we'd like high gain auto.

ENDEAVOUR Okay, it's in auto.

CAPCOM Endeavour, we need wide beam for 5 seconds and then narrow.

CAPCOM Endeavour, we need wide beam for 5 seconds and then narrow.

CAPCOM Endeavour, would you confirm that x-ray is on, please.

ENDEAVOUR Endeavour, negative. It's - it's off right now, Karl.

CAPCOM Roger. We'd like to have it on, please.

ENDEAVOUR Rog. Going on. And sorry about that, Karl. I switched it one position thinking I had it on, but it was really off.

CAPCOM Righto.

CAPCOM Al, another bulletin from Hadley Rille. The crew is back at the LM and starting their closeout. Just a few moments ago I saw them perform the philatelic wonder of the century.

ENDEAVOUR So, it's all out now, huh?

CAPCOM Roger.

CAPCOM And Al, you'll be fascinated to know that Galileo's theory of gravitation has been confirmed. Dave just dropped a hammer and a feather and they hit the ground simultaneously.

ENDEAVOUR Did you ask him what kind of a feather it was?

CAPCOM A Falcon feather, yes indeed.

ENDEAVOUR How about that.

END OF TAPE

CAPCOM Al, we're up to the time to turn pan camera mode - standby and power on.

ENDEAVOUR Okay, Karl.

CAPCOM Hey, we got a few special words also on water dumps - I guess you got one coming up in about 3 hours. They're anxious, in the future, that we don't run the waste water below 10 percent because of possible malfunctions of the waste inlet valve causing the suit exchanger to have oxygen breakthrough. So they'd appreciate your keeping a close eye on waste dumps and waste tanks water quantity.

ENDEAVOUR Okay, Karl, will do.

CAPCOM Endeavour, pan camera power off now, please.

CAPCOM Al, while you're eating up there, we've got the morning news. Are you in a situation to listen?

ENDEAVOUR Hey yeah, Karl, glad to hear it.

CAPCOM Okay. Looks like we've avoided a steel strike down here. The steel workers and management agreed to a $1 per hour pay increase last night, boosting the straight time rate to 4.45 per hour. Maybe we should take up that trade, huh.

ENDEAVOUR Sure sounds like it.

CAPCOM The mercury dipped to 68 degrees yesterday, a record low for the 1st of August in Houston; we've had some real pleasant weather here. Too bad that either you or I havn't had a chance to get outside to enjoy it, huh.

ENDEAVOUR Yeah, wait 'til next week. We'll take a vacation.

CAPCOM You said it. Representative Edith Green, Democrat of Oregon, said "Students and parents have been misled into thinking that a college degree is the only road to success." She advocated more vocational and technical training. On the sport scene, Arnold Palmer and Jack Nicklaus combined their talents to score an easy 6-stroke victory in the National PGA Championship at Vigonarre, Pa. They were 27 under par into 72 holes. The Astros smothered Montreal 8 to 1, but are still in the second division, 11 and a half games behind San Francisco. And here is a flash hot off the wire - it's only 200 years old, but very appropos, of the leak that you sprang a couple of nights ago, and also the big leak in the LM a couple of days ago, and the dispatch is as follows: The Endeavour, the original Endeavour, sprang a leak off the Great Barrier Reef at 11:00 P.M. on 11 June, 1770. It was necessary for them to dump 40 tons of consumables to prevent sinking; then they sailed on with 40 feet of water in the hold. And this information comes to you courtesy of Honeysuckle Tracking Station in Australia.

ENDEAVOUR Hey, that's very nice of Honeysuckle to tell us that and I guess you ought to know that when we sprang a leak the other night, we didn't notice that any --

APOLLO 15 COMMAND MODULE 8/2/71 16724 GET 0758 CDT CM126/2

ENDEAVOUR -- water had escaped, but when I made the plane change burn today I found it and it was sitting right in the middle of the heat shield.

CAPCOM Very good. How much water was there? Can you estimate that?

ENDEAVOUR A great big puddle of water.

CAPCOM A pint?

ENDEAVOUR Oh, I'd estimate maybe a pint, yeah.

CAPCOM Okey-doke.

END OF TAPE

CAPCOM Al, here's a little more of an update on the operation of the simbay experiment. The gamma ray x-ray and alpha partical spectrometers are continuing to collect good scientific data. I already told you about the x-ray data showing regional differences very clearly. I went down stairs and looked at it myself, and it really is almost on a kilometer by kilometer basis. You can see when you go from a high land into a mare, very interesting. The Laser altimeter, as I already told you has shown alot of interesting things about the altitudes on the moon, but, I'm not sure whether you know it or not, but it's essentially belly up at the present time. We don't have much hope for it in the future. But the data that we did get out of it was very interesting and very good. And I guess that's about all I can say at the moment.

ENDEAVOUR Roger Karl, thank you. That all sounds very interesting.

CAPCOM I'm not sure I told you previously -

ENDEAVOUR And Karl you say that the Laser altimeter is just about gone now, huh.

CAPCOM Yea, I think most people have admitted that it's giving us useless data, it has given us useless data on the last couple of attempts to use it and we have very little hope for it now.

CAPCOM Incidently, the pan camera is deteriorating to some extent, that v over h problem is getting worse, it's not completely bad yet but we're getting a lower percentage of good frames, maybe 60 or 70 percent now. And in connection with the deterioration of the pan camera, there is some feeling that as time goes by it's getting poorer and poorer and that maybe we should occasionally pulse it on the selftest cycle to take just 5 frames on interesting regions as we go along in order to get the film used up before it really deteriorates to a greater degree. I guess we're asking for your opinion on that do you have any feeling about that?

ENDEAVOUR No, but it sounds like a good idea. It seems to me like, good or bad it'd be a shame to leave some unused film in the camera.

CAPCOM Roger, well we'll hang loose on that and I think really we ought to get some better evaluation down here as to how to really use up that remaining film. People are thinking about it now.

ENDEAVOUR Right, I agree.

CAPCOM Al, when I talked about pulsing the self test there, I didn't completely have the picture clear in my own mind. If the V over H rate sensor is giving us problems this is one way of getting around it, because if we take our

APOLLO 15 MISSION COMMENTARY 8/2/71 CST8:13 GET167:34 CM127/2

CAPCOM five frames in self tests, we're essentially cutting the V over H sensor out of the circuit and taking a nominal image motion compensation there which would be better for us. So it's possible that when we wind up using that film, that we'll have somebody sitting down in the lower equipment bay, probably after you're all 3 together again, pulsing that switch every 30 seconds.
ENDEAVOUR Rog, Karl, understand it sounds fine.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 167:44 CDT 8:23 CM128/1

ENDEAVOUR Rog, Karl, understand, it sounds good.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 167:54 CDT 8:33 CM129/1

CAPCOM Al, we're ready to have gamma ray gainstep back to center.
ENDEAVOUR Okay, going on shield on.
CAPCOM Hey, it looks like you're going to have your fun this Rev by having a good look at Aristarchus, huh?
ENDEAVOUR Yeah, that's right, Karl. I've looked at Aristarchus a couple of times already in Earth shine, and I'll tell you even in Earth shine that thing is spectacular. I can see Schroter's Valley shows up very white, and the crater Aristarchus with rays extending to the west, they're all very very remarkable.
CAPCOM Roger.
ENDEAVOUR And I'm just at the terminator now.
CAPCOM We copy.

END OF TAPE

CAPCOM We see you moving over to the anti-solar point to take some gegenschein photos, it's about time we solved that problem, Al. Take some good ones, that Nikon camera ought to do a good job for us.

ENDEAVOUR Well, we are all set up Karl, and if the Nikon will do it, we'll get them.

CAPCOM Very good.

CAPCOM Did you see the 7 rilles of Aristarchus, Al?

ENDEAVOUR Certainly did. (garble) Not much to relate at this time as far as Aristarchus, or descriptions, visual observations are concerned in earth shine. As a matter of fact, I was so close to the terminator that I wasn't really dark-adapted enough to see much except the very light colored crater Aristarchus and its ejecta pattern and a very light colored Schroter's Valley and which kind of surprised me. Schroter's Valley has about the same lightness as the interior of Aristarchus itself.

CAPCOM Rog, didn't see any red spots up there, huh?

ENDEAVOUR No, I sure didn't.

CAPCOM Al, the timeline on the surface is going very well now and they're just about ready to repress.

ENDEAVOUR Oh, very good.

CAPCOM Hey, as I look back over towards Tsiolkovsky I see your new orbit is taking you over the Crater Alden, do me a personal favor and sneak in a shot of it, if you can.

ENDEAVOUR Okay.

ENDEAVOUR Houston, Endeavour.

CAPCOM Endeavour, go ahead.

ENDEAVOUR Okay, you ready for me to turn the datum systems off?

CAPCOM Roger Al. If you have secured the Sim Bay experiments, we're ready for the datum system off.

ENDEAVOUR Okay, we're secured now.
Yes, Jim (garble)

CAPCOM Okay, Al, as you go around the corner all of your systems are looking in good shape, have fun with the gegenschein photos.

ENDEAVOUR Okay Karl, hope so, and see you on the other side.

CAPCOM Righto.

END OF TAPE

CAPCOM Endeavour, Houston, standing by.
ENDEAVOUR Houston, Endeavour's on.
CAPCOM Okay, Al, good morning.
ENDEAVOUR Did you say it's morning, Ed.
CAPCOM Yea, it's morning down here Al. Al, we've got a couple of changes for you. We're going to delete the P22 because the LM crew needs a little extra time, and substitute a P24 from the command module for it. If you've already got your camera on the sextant sorry about that, if not delete it.
ENDEAVOUR Okay, I've already got it on, but that's no problem.
CAPCOM Okay, we'll give you a P24 land mark track pad whenever you're ready.
ENDEAVOUR Okay, go ahead.
CAPCOM Okay, your target's the LM T1 169 34 08 T2 38 15 TCA 4038 T3 4106 south 3 nautical miles and your attitude will have changed a little, Al. We're using roll, pitch and yaw of 000 350/231 and 000. Noun 89, latitude 26.107, longitude over 2 plus 01828 altitude minus 01326 and at 169 25 in your flight plan change the R2 of noun 78 to minus 08000. Al gave you a wrongtime.
ENDEAVOUR Roger Ed, copy -
CAPCOM 169:15 is the time where that should be. I don't see it there.
ENDEAVOUR Okay Ed, I have that one in the flight plan now, and it's 169 15 R2 is minus 06800.
CAPCOM That's affirm, and we're substituting minus 08000.
ENDEAVOUR Understand substitute for that minus 08000.
CAPCOM That's affirm, Al.
ENDEAVOUR Okay, here goes the landmark tracking pad. P24 on the LM P1169 34 08 T2 is 3815 4038 4106 that's 3 miles south, roll, pitch and yaw is 000 350/231 000 noun 89's are plus 26107 plus 01828 minus 01326 and I changed R2 of the DAP load.
CAPCOM Okay Al, and we will need marks on them of course.
ENDEAVOUR Roger.
CAPCOM Be back with you in a little while.
ENDEAVOUR Oh, okay.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 16916 CDT 950 CM132/1

CAPCOM Endeavour, Houston.
ENDEAVOUR Houston Endeavour, go ahead.
CAPCOM Al, it seems like we had an error on that last pad I read you. The altitude should be minus 00133, understand.
ENDEAVOUR Understand the altitude should be minus 00133.
CAPCOM That's affirm. Sorry about that.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 169:26 CDT 10:00 CM133/1

CAPCOM Endeavour, Houston. Omni Charlie, please.
ENDEAVOUR Omni Charlie.
CAPCOM Endeavour, Houston. On your high gain go wide and manual please.
ENDEAVOUR Roger. Wide and narrow - wide and manual.
CAPCOM Thank you, Al.
ENDEAVOUR Okay, any angles you want me to put in?
CAPCOM Endeavour and Falcon, Houston. We're going to delete the VHF check at this time to give you a little more time.
ENDEAVOUR Roger. Endeavour's got the VHF set up anyway.
CAPCOM That's fine. We just won't bother the LM with it.
ENDEAVOUR Okay. You might tell them though, I've got my - if you want to check the rendezvous radar I've got the transponder on.
CAPCOM Al, you're in the mud, you'll have to try me on that one again.
ENDEAVOUR Okay, just wanted to let you know that I've also got the rendezvous transponder on.
CAPCOM Okey-doke, thank you Al.
CAPCOM Endeavour, Houston. One minute to T 1.
ENDEAVOUR Roger, thank you.

END OF TAPE

APOLLO 15 COMMAND MODULE 8/2/71 16936 GET 1020 CDT CM134

CAPCOM 30 seconds to T2. 10 seconds to T2, Endeavour.
ENDEAVOUR Roger.
ENDEAVOUR Okay Houston, Endeavour, through with tracking, but I'm not sure they're very good marks.
CAPCOM Okay, Al, we understand, high sun angle may have made it difficult.
ENDEAVOUR Yeah, seemed to have a lot of interference and deflection from the landmark by the site part of the optics.
CAPCOM Understand, Al. Al, do you think you saw it at all?
ENDEAVOUR Yeah, I think the first couple of marks were OMNI min but I couldn't hold it.
CAPCOM Okey-doke.
ENDEAVOUR I kept - I kept losing.

END OF TAPE

APOLLO 15 MISSION COMMENTARY 8/2/71 GET 169:56 CDT 10:30 CM135/1

CAPCOM Endeavour, Houston. In the blind, give us best OMNI, please.
CAPCOM Endeavour, Houston. Best OMNI, Houston. In the blind, best OMNI, please.
CAPCOM Endeavour, Houston. Best OMNI.
CAPCOM Hello, Endeavour. Best OMNI, please.
CAPCOM Endeavour, Houston. Give us best OMNI, please.
CAPCOM (garble)
CAPCOM Endeavour, Houston. Best OMNI.
CAPCOM Endeavour, Houston. Best OMNI.

END OF TAPE

CAPCOM Endeavour, Houston. How do you read?
CAPCOM Endeavour, Houston. Best Omni please.
CAPCOM Endeavour, Houston. How do you read?
CAPCOM Endeavour, Houston. How do you read?
CAPCOM Endeavour, Houston. I'm in the blind. Best Omni please.
CAPCOM Endeavour, Houston. Best Omni please.
CAPCOM Endeavour, Houston.
CAPCOM Endeavour, Houston. How do you read?
CAPCOM Endeavour, Houston. How do you read?
CAPCOM Endeavour, Houston.
CAPCOM Endeavour, Houston. In the blind, how do you read?
CAPCOM Endeavour, Houston. Give us your best Omni, please.
CAPCOM Endeavour, Houston. In the blind. I'm going to give you a lift off time, 171 37 2236. We'll uplink you at AOS since we have no contact. And Endeavour, Houston. TPI 172 29 3900. I'll repeat lift off 171 37 2236 TPI 172 29 3900. CSM weight for your DAP 35 995.
CAPCOM And Al, if you read. Let's come around to AOS trying to get COM, we have a lot of work to do.
CAPCOM Endeavour, Houston. One minute to LOS.
ENDEAVOUR Roger, Houston, Endeavour and did you get the gyro torquing angles yet?
CAPCOM Al, we haven't had you for the last 20 minutes. Did you get my uplinks, rather my pads up?
ENDEAVOUR Negative.
CAPCOM Okay, let me give you one quickly, you've got 40 seconds to LOS. TIG is 171 37 2236. TPI 172 29 3900. Your CSM weight 35 995, I'm going to lose you in about 15 seconds. We'll get all your uplinks and the rest of the pads at AOS.

END OF TAPE