

## Apollo 11 Highlights Day 3

CAPCOM 11, we're really amazed at the quality of the picture up in the tunnel. It's really superb. Over.

SC Hey, we're about to open our hatch now.

CAPCOM Rog.

PAO Buzz Aldrin reporting that he's halfway into the LM. His view is inside the LM cabin.

CAPCOM Hey, that's a great shot right there. We see you in there. Guess that's just Neil and Mike. Better be anyway.

CAPCOM We see you waving.

PAO Aldrin has apparently carried the camera into the LM with him and showing us Neil Armstrong and Mike Collins back in the CSM.

CAPCOM Hello, Apollo11, Houston. We're standing by to watch your set up on the PTC at any time. You can start off at the VERB 49. Over.

SC Wilco. We're just finishing up the probe and about to close up the hatch here. We're going to be a couple minutes late probably starting on the PTC.

CAPCOM Roger, no sweat, 11. We're standing by. Over.

PAO This is Apollo Control. That was Neil Armstrong reporting that they are now reinstalling the probe and drogue, which is just about on the flight plan schedule, and they reported that they would be putting the spacecraft in a slow roll shortly to maintain passive thermal control. In that mode the spacecraft rotates at the rate of about 3 revolutions per hour to maintain even heating. We have a precise time on that sphere of influence change, the point of which the moon - for calculation purposes here. Mission Control, comes under the predominate influence - the spacecraft comes under the predominate influence of the moon's gravitational field, and we now calculate that that will occur at 61 hours, 39 minutes, 55 seconds, ground elapsed time.

CAPCOM Hello, Apollo 11, Houston. Mike, there's no wait required where REG's are steady you can proceed on. Over.

SC I'm doing it, Charlie.

CAPCOM Roger.

SC The tunnel's all taken care of and drogue, probe and hatch are all back in.

CAPCOM Roger. Copy - Out.

CAPCOM Hello, Apollo 11, Houston. We have some new additions to your alternate contingency checklist, if you would break that out. Over.

SC Stand by.

SC Okay, Houston. It's ready to copy.

CAPCOM Roger, 11. If you'll turn to page F/2-22. Over.

SC Okay, I have F/2-22.

CAPCOM Roger, Nell. Under column L - that's column Lema, line 06. The new data is 00001. Line 07, the new data is 02134. Over.

SC Okay, I have in F/2-22, column Lema, item 6, 00001. Item 7, 02134.

CAPCOM Roger, that's correct. Thank you much. Out.

CAPCOM 11, Houston. For your information, those 2 entries are an update to your Delta-H that we have already uplinked into the CMC. Over.

SC Roger. Thank you.

SC Well, what was I marking on, Charlie, about an 18 parameter line or what?

CAPCOM Our update puts you to the Delta-H to 35 parameters, Mike. Over.

SC Okay.

CAPCOM Hello Apollo 11, Houston. We've got some switch positions for you for the high gain, over.

SC Okay, go ahead.

CAPCOM Roger, Buzz. Select BRAVO, OMNI, high-gain track to manual beam wide, over.

SC Okay, Bravo, OMNI track manual and beam Y.

CAPCOM Roger, and your high-gain angles are minus 50 on the pitch, 270 on the yaw, over.

SC Okay, going there now.

CAPCOM We have some updates and some things we'd like to talk to you about, if you aren't in the middle of your meal. If it's convenient any time for you, we're ready with some updates. Over.

SC What are the updates going to apply to?

CAPCOM Roger. We have a couple of changes on the LM mission rules NO/GO for your NO/GO card, Neil. One slight change on the APS DPS fuel and temp pressure cards, and we have a change to the procedure for the secondary radiator leak check, which is to be formed at - performed at 71 hours tomorrow, and also some indications that we have a couple of landing site obliques stowed in the wrong place. Over.

SC Okay, if any of those in the flight plan. The secondary radiator, for example.

CAPCOM That's affirmative. The secondary radiator leak check is called out in the flight plan at 71:20. That procedure is listed in your launch operations book on page 2-9, L2-9. We'd like to change that procedure. Over.

SC Okay. Stand by.

SC Charlie, on the secondary leak check, just read us verbatim like you want, and I'll copy directly into the flight plan and not fool around with the checklist.

CAPCOM Roger. That's fine if you're ready to copy, stand by.

SC Ready to copy on the leak check.

CAPCOM Roger. It's monitor the secondary accumulator quantity. Step 2 is secondary glycol to radiator valve normal for 30 seconds then bypass. If no decrease in secondary accumulator quantity, - Are you with me?

SC Yah, I'm with you.

CAPCOM Okay. If no decrease in secondary accumulator quantity. Secondary glycol to radiator valve to normal. Next step, secondary coolant loop pump AC1 or AC2. After 3 minutes, verify glycol discharge secondary pressure 39 to 51 psig. Also verify secondary EVAP APS TEMP has changed. Next step, secondary coolant loop pump, off. Secondary glycol radiator valve to bypass. That ends the procedure. Over.

SC Okay. I read back monitor secondary accumulator quantity, secondary glycol radiator valve, normal for 30 seconds then to bypass. If no decrease in secondary accumulator quantity, secondary glycol to radiator valve to normal. Secondary coolant

loop pump AC1 or 2. After 3 minutes, verify glycol secondary discharge pressure 39 to 51 psig. Verify secondary evaporator outlet temp has changed. Secondary coolant loop, off. Secondary glycol radiator valve to bypass. And what's the reason for the change, Charlie?

CAPCOM Roger. Stan is concerned that our present procedure as shown in the checklist does not really flow a glycol through the radiator and they want to verify that we do not have a plugged secondary radiator. Over.

SC Okay. They didn't have any abnormal indications in that system, so far?

CAPCOM Negative. This is the procedure that came up with. It's just a check, Mike. Everything's looking great to us. Over.

SC Okay, Charlie.

SC Charlie, we'll get back with you on these other changes in a few minutes. Okay?

CAPCOM Roger, Nell. No hurry. Over.

PAO This is Apollo Control at 59 hours, 9 minutes. Apollo 11 now 182 000 nautical miles from Earth, and the velocity down to 3072 feet per second. We've had very little conversation from the spacecraft in the past 40 minutes or so. At this time the flight plan calls for the crew to be getting ready to begin their eat period. That would be followed by a 9 hour rest period. We have one change to the flight plan to pass along. The television transmission which had been scheduled at 100 hours, 20 minutes to 100 hours, 50 minutes in the flight plan has been deleted. This transmission was to have occurred during the formation flying prior to the powered descent to the lunar surface. The decision to delete the TV transmission from the flight plan was made due to a lack of available satellite channels to relay the signal from the tracking site at Madrid to Houston for conversion. The intermittent music that we're getting is apparently coming from the spacecraft. The crew has onboard portable tape recorders with music on the tapes. As they store their own comments on the tape, the music, of course, is erased and apparently the music is triggering the VOX operated microphones and we're getting intermittent music down from the spacecraft.

CAPCOM 11, Houston. We were wondering who's on horns?

SC Back in Houston?

CAPCOM We just had a little music there.

SC Just to keep you entertained.

CAPCOM Rog. That was good. You can keep it coming down, 11.

SC           Okay.

SC           Because it's a special occasion today, Houston. This is the third anniversary of Gemini 10.

CAPCOM    Roger. Happy anniversary.

SC           Stay there.

PAO           This is Apollo Control. That comment a moment ago about the tenth anniversary of - about the third anniversary of Gemini 10 came from Mike Collins, who along with John Young flew the Gemini 10 mission, July 18 through July 21, 1966.

PAO           This is Apollo Control. That comment a moment ago about the tenth anniversary of - about the third anniversary of Gemini 10 came from Mike Collins, who along with John Young flew the Gemini 10 mission, July 18 through July 21, 1966. The brief bit of music that we got from the spacecraft was coming to us from a distance of 182 thousand 190 nautical miles.

SC           Houston, Apollo 11, ready to copy your updates.

CAPCOM    Roger, stand by.

CAPCOM    Okay Buzz, the first item, is that we have indications that your landing sight obliques are not in the proper position. If you will check we think that the intermediate scale landing sight oblique is stowed in the CSM lunar land mark book. We think that the large scale, landing sight oblique is stowed in the back of the LM lunar surface map book, over.

SC           I think I heard you Charlie, but I'm not sure that I understand.

CAPCOM    Roger, according to our storage list the landing sight oblique should be in the transfer bag. In the back up set of data, the intermediate scale oblique is in the CSM lunar landmark book and the large scale oblique is in the back of the LM lunar surface map book, and that's the reason we think that they might be, not where you think they are, over.

SC           Okay, we've got three obliques. The last one is one I asked for recently. It's just a blow up of the second one. The first one is one that's got dotted lines on it, indicating hidden view and 50 degree LPD, and all three of those are in the transfer book, over.

CAPCOM    Roger, fine. We were wrong in our back up set. We had those out of place. Looks like the on board data is good. We just wanted to let you check on that

one. We have an update on the APS DIPS fuel cord that you place on the panel. It's a typo error. If you'll break out that little card, we've got to correct that typo error, over.

SC Rog.

SC Okay, I got it.

CAPCOM Rog, Buzz. Under the DIPS column, on the pressure side. You go down to the fourth item to the pressure greater than 150 PTCA should be greater than 65 percent, over.

SC Okay, it's greater than 1.8 but less than 65 and greater than 150 for greater than 65.

CAPCOM That's affirmative. Out.

CAPCOM And we have three items on the mission rules no go card, if you are ready to copy those, over.

SC Okay, I've got the mission rules no go.

CAPCOM Roger, Buzz. First entry is on the EPS, under AC bus A. The line extends all the way to high gate. Actually, the line should read at DOI it would be no go AC bus A. After that the no go would be both buses. So if you will just pencil in both buses from TDI through high gate. It will be correct for that line, over.

SC Okay, I got that AC buss A for DOI and both busses no go for PDI on.

CAPCOM That's affirmative up until high gate. You can stop at - the line in front of the column 5 minutes to low gate. Now the next line is under the G&C exchange, pitch and roll GDA. You can scratch that line completely, over.

SC Roger, got it.

CAPCOM Okay, Buzz. Last entry is down under RCS and it is a typo error under the three - in the line three axis attitude control. We proceed to the right at PDI plus 05 you'll see one axis. The line goes all the way to low gate to touchdown. That's incorrect. The line should stop under 5 minutes to low gate, over.

SC Okay, we are stopping at it 5 minutes to low gate.

CAPCOM That's affirm. That completes that card. The rest of the update are just really for your information based on our 58 hour platform - look at the platform. We are really in good shape. Your gyros have almost no drift in them since the plotted update we were looking at X of a minus 2.24 MERU, Y of plus .87 Z of minus .11. Since the update, which was based on the 52 hour P52, I believe. We gave you

an X drift of plus .79, yaw of plus 1.06, Z of plus .02 MERU. The difference we see between the 52 hour and the 57 hour alignments work did not really give us enough time to get a real good, completely valid update on the drift check. So we're real satisfied with the way the gyros are looking. The PIPA'S are looking great also. We are in real good shape with those also, over.

SC This is Apollo 11, radio check.

CAPCOM Roger, reading you fly by OMNI, over.

SC Okay, that's clear. You cut out when you were talking about the platform at something about 52 hours and after that we never heard you again.

CAPCOM Roger, guess we were changing antennas. Stand by. That's affirmative, 11. We were swapping antennas on you down here. Basically the word here is that we have a real good platform, very small drift on the gyros and very small drift in our PIPA'S, over.

SC Roger, thank you. And I would like to have a few words of clarification if you will give them to me on the RCS reel, what that change of pitch may mean.

CAPCOM Copy, a few words of clarification on the RCS, oh roger. The update there, Neil, you are speaking of about the one axis down to 5 minutes of low gate?

SC Yah, that's right. I'm not quite sure what that really means (garbled).

CAPCOM Standby, I'll make sure I got my story straight with Control. Standby.

SC Okay .

CAPCOM 11, Houston. On the RCS, what we about one axis prior to low gate, we would recommend an abort. This would require a- a loss of - of two distinct jets which is not very probable but that is what we are recommending. After low gate we would - continue on. We would recommend that we continue on to attempt a landing, over.

SC Roger. Okay. I think I owed him that.

CAPCO Rog.

SC Charlie, did you say you had some updates for me from the lunar surface book?

CAPCOM Apollo 11, say again. You were cutting out. Over.

SC Roger. Did you say you had some updates for us in the lunar surface book? Over.

CAPCOM Negative. At this time, we do not have any updates for the lunar surface book. We wanted you to have it just in case. Over.

SC Rog. You were cut out that time.

CAPCOM Roger. At the present time, we do not have any updates for you on the lunar surface book. We are thinking about some, and kick him around, but they're very minor changes. Over.

CAPCOM I1, Houston. Did you copy that transmission?

CAPCOM Apollo 11, Houston. We swapped antennas on you again. I say again that we do not have any lunar surface update - book updates at this time. We're considering a few minor ones, but we're ... around the MOCR. Over.

SC Apollo 11. I understand.

SC Houston, 11. We have a crew status report for you.

CAPCOM Roger. Go ahead, 11.

SC Okay, radiation CDR 11009, CMP 10010, LMP 09011. No medication.

CAPCOM Roger, 11. We copy for the radiations and we're considering this PTC looks sort of weird to us so we're considering stopping and starting over again and we'll be with you in a couple of minutes. Over.

SC Okay.

CAPCOM Apollo 11, Houston. Would you give us the LM CM Delta-P as reading? Over.

CAPCOM Hello Apollo 11, Houston. We switched the antennas on you again. Would you please give us the LM CM Delta-P reading? Over.

CAPCOM Hello Apollo 11, Houston. Over.

SC Go ahead. 11 here.

CAPCOM Rog. We switched antennas on you there moments ago, Neil. Will you please give us the LM CM Delta-P reading? Over.

SC It's less than 21.

CAPCOM Roger.

SC 21.5 now Neil says, Charlie.

CAPCOM Roger, thank you Mike, could you give us some help? This PTC is strange, it's not like anything we've seen before. We were wondering if you all have had any events of any odd data that could help us out, over.

SC I didn't understand that. Say again.

CAPCOM Roger, we're looking at a, sort of a funny looking PTC. We've already drifted out to 70 degrees in pitch and we're wondering if you all had any vents or any such thing as that, that could have caused us to pick up these rates to drive us off, over.

SC Negative, Charlie. We don't know of anything.

CAP COM Roger.

SC Unless it's got something to do with that entry from the position that we want to be in. I don't know.

CAPCOM Roger, when we started off it looked real fine to us, now it's drifting off with a funny pattern that we haven't seen previously on a flight, and we're just trying to figure out, I think we'll probably start it over again. We'll be with you momentarily, over.

SC Okay.

CAPCOM Apollo 11, Houston. We hate to say it, but we'd like to terminate this PTC and start over again. We bare no assurance that we're going to get it through the sleep period. With this funny configuration, or funny pattern. We'd like you to stop it now and go back to pitch 090 yaw 0 and roll, whatever you stop on, over.

SC Roger.

PAO This is Apollo Control at 59 hours 57 minutes. A few moments ago you heard Capcom Charlie Duke advise the crew to terminate the passive thermal control mode that they are presently in and reestablish the three revolutions per hour roll rate about the spacecraft longitudinal axis that is used for thermal control. We had noticed a unexplained deviation from the attitude that the spacecraft was set up in. In this roll mode ideally it would roll about the longitudinal axis with very little wobble and if wobble is introduced for one reason or another, the reaction control system jets would come on as soon as the motion out of the prescribed plane had occurred and gone beyond prescribed limits, in this case 30 degrees to correct. The jet firings on past missions do tend to disturb the crew's sleep. Rather than have the reaction control system jets come on during the night and perhaps have to awaken the crew to reestablish the passive thermal control mode at that time we elected to correct it now.

CAPCOM You disabled Bravo and Charlie select quads ALPHA and DELTA, over.

CAPCOM Apollo 11, Houston, over.

PAO This is Apollo Control. We're getting quite a bit of noise on the air to ground circuit at this time as the spacecraft rotates from one OMNI antenna around to the next and we momentarily- lose lock-on. At this time, Apollo 11 is 183,544 nautical miles from Earth and the velocity, holding fairly constant now, at about 3042 feet per second. It's been moving down towards 3000 feet per second and seems to be leveling off somewhat.

PAO This is Apollo Control. We're going to take the air to ground circuit down temporarily until a stronger antenna lock is - . Here's a call to the crew. We'll stand by for that.

PAO This is Apollo Control. We will take down the air to ground circuit down at this time until we reestablish sufficient signal strength to eliminate the noise on the circuit.

PAO This is Apollo Control at 60 hours, 10 minutes. We've reestablished good antenna lock-on this time, and we'll continue to monitor for any conversation from the spacecraft. The crew is presently reestablishing the passive thermal control rotation rate of 3 revolutions per hour. Following that we expect they will begin their rest period. At the present time Apollo 11 is 183 821 nautical miles from Earth at a velocity 3037 feet per second.

CAPCOM Hello, Apollo 11. Hello, Apollo 11. Over

SC Hello, Houston. You call us?

CAPCOM Roger. Reading you about 1 by. Looks like we picked a super attitude here for PTC stabilization. We're reading you in backup voice now. Over.

SC You're reading me loud and clear?

CAPCOM Rog.

SC Would you like us to take another antenna?

CAPCOM I think we've got about the best configuration. We have been doing it off the ground here, 11. We'll just keep it as it is. Over.

SC Roger.

CAPCOM Apollo 11, Houston. Would you select COMMAND RESET and OMNI ALPHA? Over.

SC Houston, 11. We're in OMNI ALPHA.

CAPCOM Roger. We read you about 3 by now. Over.

SC Roger.

CAPCOM Apollo 11, Houston. We is stable. You can start the PTC. Over.

SC Roll left, don't you?

SC Houston, Apollo 11. Check this page S-9-7. I've completed step 8 and I'd like to know what you think is ideal timing between step 8 and step 9 and step 10 on that page? Over.

CAPCOM Roger. Stand by.

CAPCOM Apollo 11, Houston. We don't see any time constraint. We'd like you to go ahead and set up the wide deadband, then go through step 10 and 11. Over.

SC Okay. Will do. I don't see any constraint here, Charlie. I was just checking to make sure because last time, I went from 8 to 9 to 10 to 11 a little bit more swiftly than I'd been doing in the past.

CAPCOM Roger.

SC Step 11 complete.

CAPCOM Roger. We copy.

CAPCOM Apollo 11, Houston. Would you please select OMNI BRAVO? Over.

SC Roger. BRAVO.

SC Houston, Apollo 11. How do you read on BRAVO?

CAPCOM Roger. Reading you 5 by.

SC Same here.

CAPCOM Apollo 11, Houston. Looks like we've got a good PTC going. It's good night from the white team. Over.

SC Okay. See you tomorrow. Thank you for everything.

PAO            This is Apollo Control at 60 hours 37 minutes. We said good bye - goodnight to the crew about 10 minutes ago. We expect that they will be settling down their rest period shortly. And at the present time, Apollo 11 is 184,600 nautical miles from earth. The spacecraft velocity is presently 3,023 feet per second. I understand there has been some interest in a comment made by Nell Armstrong during the television transmission about the EVA floodlight. Armstrong's remark was that the mast which the light is mounted on, appeared charred. He reported that the light works but had apparently the mast that supported it had apparently been damaged during the launch phase. This light would be used in the event of a contingency EVA. It would have to function in a normal mission such as we are presently flying. And in the event that a extravehicular activity was necessary for transfer of the crew from the LM into the command service module, the light would be an aid in providing exterior lighting of the hand rails, but would- repeat, that it would have no function in a normal mission and the charring which Armstrong reported is not considered significant at this time. We don't expect to have any further conversation with the crew. We will continue to record any remarks that we get and play those back. The passive thermal control mode, which was reestablished, appears to be functioning well at this time and all spacecraft systems are functioning normally. At 100 - rather 60 hours 39 minutes, this is Apollo Control, Houston.

PAO            This is Apollo Control an 60 hours 47 minutes. We just got a call from the spacecraft requesting that we give them the position of the S-IVB in respect to the spacecraft and we're currently coming up with that bit of information, so we'll stand by.

SC             Houston, Apollo 11.

CAPCOM      Go ahead, 11, over.

SC             Do you have any idea where the S-IVB is with respect to us?

CAPCOM      Stand by.

CAPCOM      Apollo 11, Houston, the S-IVB is about 6000 nautical miles from you now, over.

SC             Okay, thank you.

SC             Houston, Apollo 11, how is the PTC looking?

CAPCOM      Stand by.

CAPCOM      11, Houston. The PTC looks great to us, over.

SC             Hey, do you have any idea what happened to the previous one?

CAPCOM      We have absolutely no idea, over.

SC            Okay. Did it look like it was all right and just all of a sudden start diverting?

CAPCOM    Negative, if you look at the plot which we'll save for you and let you see it post flight. It started off immediately on the first rev and just spiraled out to about oh, 20 to 20 degrees in pitch, and then it seemed to be setting up a spiral around an offset pitch point of about 20 degrees off from 90 degrees, but we didn't want to take a chance that it would become stable at that point. We thought it might diverge so we told you and started over again, over.

SC            Okay, no complaints. I was just curious as to what had happened.