

## Apollo 11 Highlights Day 6

CAPCOM            Tranquility Base, Houston.

TRANQUILITY      Roger. Go ahead.

CAPCOM            Roger. Our guidance recommendation is PGNCS and you're cleared for takeoff.

TRANQUILITY      Roger, understand. We're number one on the runway.

CAPCOM            Roger.

ARMSTRONG        Bait scale 25.

ALDRIN            25.

ARMSTRONG        Ascent translation 4 jets. Balance couple on.

ALDRIN            Balance couple on.

ARMSTRONG        BTCHS, balance push button reset, board to stage reset.

ALDRIN            Reset.

ARMSTRONG        Headband minimum, bat control to mode control, earth control auto, both

ALDRIN            Auto, auto.

PA0                Crew of Eagle going through their preadmission checklist.

ARMSTRONG        The team is standing by for 2 minutes to - for the guidance steering in the AGS.

CAPCOM            Eagle, Houston, you're locking good to us .

TRANQUILITY      Roger.

TRANQUILITY      ...9, 8, 7, 6, 5, abort stage, engine arm ascent, proceed, That was beautiful. 26, 36 feet per second up. Be advised for the pitch over. Very smooth. Aldrin's (garbled) logged. Very quiet ride. There's that one crater down there.

PA0                1000 feet high, 80 feet per second vertical rise.

CAPCOM Eagle, Houston. Request manual start over ride.

EAGLE Roger.

PAO 2600 feet altitude.

EAGLE (Garbled)

CAPCOM Eagle, Houston, 1 minute and you're looking good.

CAPCOM Columbia, Houston. We need the sec arm circuit breakers CLOSED.

COLUMBIA Okay. Going in touch time Bat A and Bat B.

CAPCOM Columbia, Houston. Logic looks good. You can arm your PYROs at your convenience.

COLUMBIA Thank you.

COLUMBIA Eagle, you can find your start to maneuver to CSI.

EAGLE Okay.

PAO This is Apollo Control about 6 and 1/2 minutes to ignition on the thermal phase maneuver in which the crew of Eagle will thrust along the line of sight toward Columbia. Distance now between the two spacecraft some 38.6 nautical miles closing at a rate of 110 feet per second.

CAPCOM All your selections looks good to us. Out.

EAGLE And, Mike, if you want our target Delta-v, I'll give it to you.

COLUMBIA Ready to copy.

EAGLE 127 03 3082 +20 2.7 +1.7 -10.6, over.

COLUMBIA 127 03 3082 +20 2.7 +1.7 -10.6, thank you.

EAGLE I'm showing a good bit of out of plane velocity on my cross pointers. Mike.

COLUMBIA Rog, I have no indication of it.

COLUMBIA Coming up on 1 minute to TIG, Neil, how's it looking?

EAGLE Pretty good.

COLUMBIA Good.

EAGLE COLUMBIA Burn complete.

EAGLE Read, burn complete.

COLUMBIA Roger, thank you.

CAPCOM Eagle, Houston, AFT OMNO, low bit rate and we'll see you at 1 27 +51.

EAGLE I'm not going to do a thing, Mike. I'm just letting her hold in attitude hold.

COLUMBIA Okay.

EAGLE (Garbled)

COLUMBIA Okay.

COLUMBIA I'm pumping up cabin pressures.

COLUMBIA That was a funny one. You know, I didn't feel it strike and I thought things were pretty steady. I went to retract there, and that's when all hell broke loose. For you guys, did it appear to you to be that you were jerking around quite a bit during the retract cycle?

EAGLE Yah. It seemed to happen at the time I put the contact thrust to it, and apparently it wasn't centered because somehow or other I accidentally got off in attitude and then the attitude hold system started firing.

COLUMBIA Yah, I was sure busy there for a couple of seconds. Are you hearing me alright? I've got a horrible squeal.

EAGLE Yes, I agree with that, but we hear you okay.

COLUMBIA Houston, Apollo 11. Over.

CAPCOM Apollo 11, Houston. Go.

COLUMBIA Roger. I'm supposed to adjust the oxygen flow in this thing at six tenths of a pound per hour, but being as how this transducer is not working right, could you give me an updated number?

CAPCOM Affirmative. You want to go ahead and *adjust your* O2 flow *until* it just goes off the peg, and then crank the direct O2 valve back down about 5 degrees. Over.

COLUMBIA Boy, you were really waiting for that one, weren't you? Okay, Ron, thank you.

CAPCOM Hello Apollo 11, Houston. How did it go? Over.

SC Time to open up the LRL doors, Charlie.

CAPCOM Roger. We got you coming home. It's well stocked.

SC Okay. Burn status, LP20. Burn time was 2 plus 30. Pads angles DELTA FEPX after, well, after trim was .1, ZGY .9, BGZ .1. Delta VC minus 17.9 Fuel 10.6 OCS 10.4. Unbalance minus 50.

CAPCOM Roger. Copy, Neil. Sounds good to us. And Apollo 11, Houston. All your systems look real good to us. We'll keep you posted.

SC Roger. Hey, Charlie boy, looking good here. That was a beautiful burn. They don't come any finer.

CAPCOM Rog. Apollo 11, Houston. I wondered if you compared your state vector accuracy with the one in the LM flights? Over.

SC Yes sir, and it looked very nice. Verb 83 was plus 00070 and minus 00008.

CAPCOM Rog. 11, Houston. I was looking at your bank Bravo nitrogen tank, it didn't leak a bit – correction - didn't leak a bit this time. Over.

SC Roger, looked good here. Cabin pressure was hanging in there around 100 the latter part of the burn. It started oscillating a little bit and got down a little bit below 100.

CAPCOM Roger.

SC 96 or so.

CAPCOM Roger.

PAO Most of the conversations so far has been from Neil Armstrong and Mike Collins. That last comment came from Collins. Our first report after acquisition was from Neil Armstrong. That trans-earth injection burn was very close to nominal. At this time we show the spacecraft traveling at a speed of 7,603 feet per second. The velocity already beginning to drop off and we're at an altitude of 445 nautical miles now from the moon. This is Apollo Control. We now show the spacecraft traveling at 7,378 feet per second.

Altitude 568 nautical miles. The next order of business will Director, Gene Kranz, requested his flight controllers, prior to acquisition of signal to review their procedures and to take as many steps as possible to get the crew to sleep as soon as possible. There will be a press conference in the Building 1 auditorium and we estimate the time on that at about 12:30 Central Daylight Time. And our LM telecommunications engineer reports that we've just had acquisition of signal from Eagle which is still in lunar orbit. The last fix that we had on Eagle's orbit showed an apogee of 64. 1 and a para, apocynthion rather of 64. 1 and a paracynthion of 64.4 nautical miles. The spacecraft altitude is now climbed to almost 700 nautical miles from the moon. We show a weight of 26,510 pounds, about 10,000 pounds less than what we had actually about 1100 or 11,000 pounds – let's correct that - about 10,100 pounds less than what we had prior to the transearth injection burn.

CAPCOM Apollo 11, Houston. Would you give us PU and accept. We've got a REFSMMAT for you/ Over.

SC Okay.

CAPCOM Thank you.

CAPCOM Hello Apollo 11, Houston. We've got the load in. You can go back to block. Over.

SC We're there.

CAPCOM Rog.

SC Your command module sound seems to be working out pretty well, Charlie, the amount we carried. Looks like we carried just about what we needed.

CAPCOM Wonderful.

SC We have one 16 millimeter roll on the ASA 1000 color interior film. We were thinking of shooting that during entry window number 4 on bracket and try and get the camera guide sometime in the last couple of days. Give us all a good time for that.

CAPCOM Roger.

PAO This is Apollo Control. The flight dynamics officer reports that the burn very nominal, almost precisely as planned, the burn duration was about 3 seconds long, but the velocity change was almost precisely what we had been expecting. At the present time, Apollo 11 is 1076 nautical miles from the moon. The velocity continuing to drop off, down now to 6698 feet per second.

PAO This is Apollo Control at 136 hours, 44 minutes. Apollo 11 is now 3,720 nautical miles from the moon and traveling at a speed of 5,367 feet per second. During

the press conference we accumulated about 4 minutes of taped conversation with the crew. The crew reports at this time that they are completing taking pictures and they are getting ready to realign their guidance system platform. We'll pick up the tape conversation and then stand by for any following live communications with the crew. We anticipate that they will be shortly beginning their pre-sleep checklist in preparation for a well-deserved rest period.

CAPCOM Hello Apollo 11, Houston. I wondered if during the TEI burn you utilized the oxidizer flow valve on the valve on the PUGS? Over.

SC Yes we did. Based on your very excellent briefing I was expecting the thing to continue desiring increase for the whole time since we started out with it in increase and I saw that we pretty quickly crossed the line and started falling about 6 or 7 percent behind. So I was still expecting it to move up and then I went down to full decrease and brought it back down to a difference of 2 percent. Over.

CAPCOM Roger. Thank you very much, Buzz.

SC 2 tenths of a percent, I'm sorry.

CAPCOM Right. Thank you. Apollo 11, Houston. You can go to PTC attitude and torque at your, and do the P52 and torque at your convenience. Over.

SC Hey, we got to take some more pictures, Charlie. Is there any constraint normally in staying here for a while?

CAPCOM No sir.

SC Thank you.

CAPCOM Go ahead 11. Over.

SC How does that tracking look or is it too early to tell?

CAPCOM Stand by, Mike.

CAPCOM FIDO's are looking at the data. It's too early to tell yet exactly. It's looking real good so far. We'll have you some answers shortly on trajectory. Over.

SC Yeah. What FIDO is it?

CAPCOM Jay Green.

SC Howdy Jay.

CAPCOM 11, Houston. We have a DAP CSM update for you.

SC Go ahead.

CAPCOM Rog. That CSM weight, Mike, 26370. Over.

SC Thank you, sir.

CAPCOM You're welcome. Apollo 11, Houston. We've taken your onboard vector and propagated it for you and it's looking real good. We only got about 24 minutes tracking now and it's really too early to tell on the radar. Over.

SC Roger, I understand.

CAPCOM Hello Apollo 11, Houston. Mike, did you notice any transients at ignition on TEI? Over.

SC Yah. The transients are more noticeable than on previous burn, Charlie. I just wrote it off on the fact that we had a light command module but there was considerable roll activity which dampened down after the first 20 seconds, I would guess, after the burn but then there was also some pitch and yaw activity. I don't believe it was abnormal and seemed to be deadbanding fatherly crisply in roll plus or minus about 8 degrees inside the center line and after the first couple of, oh, after the first 20 seconds or so the gimbals were quiet and pitch and yaw were relatively quiet. Before that there was some oscillation but mostly just in rates-total attitude hung in there pretty well.

CAPCOM Roger. Thank you very much. We were looking at the playback and we saw some things that rather stood out. We'll be back with you later on that.

SC Okay.

CAPCOM Apollo 11, Houston. Have you finished taking pictures? Over.

SC We're just finishing up, Charlie.

CAPCOM Roger.

SC We'll get started on the P52 here pretty soon.

CAPCOM Copy.

SC (Garbled).

PAO This is Apollo Control. That brings us up to date with the taped conversation. We'll stand by for any further live communication from the crew before they begin their sleep period. We've gotten some preliminary figures from the Flight Dynamics Officer on that transearth injection burn after a review of the telemetry data

and it shows that our change in velocity was nominal 3,283.5 feet per second. We also show a nominal burn time of 2 minutes, 28 seconds. The crew reported the burn time about 2 to 3 seconds long based on their onboard data. The ground data shows

the burn to have been just about nominal. Based on the preliminary tracking it would appear that the splash down would occur almost precisely as predicted or planned in the flight plan. That would be at 195 hours 18 minutes 40 seconds ground elapse time. And we would expect that splash down time to change somewhat during the transearch coast particularly as the need or lack of need for midcourse correction becomes more apparent with additional tracking. At this time Apollo 11 is 4,086 nautical miles from the moon traveling at almost precisely 1 mile per second, 5,283 feet per second, and that's just updated 5,280 feet per second.

CAPCOM Hello Apollo 11, Houston. You can crank up on the PTC at any time. Over.

SC Thank you.

CAPCOM Apollo 11, Houston.

SC Go ahead, Houston.

CAPCOM Rog, 11. This is the regional CAPCOM. Congratulations on an outstanding job. You guys have really put on a great show up there. I think it's about time you power down and got a little rest though you've had a mighty long day here. Hope you're all going to get a good sleep on the way back. I look forward to seeing you when you get back here. Don't fraternize with any of those bugs in route except for the Hornet.

SC Okay. Thank you boss. We'll, we're looking forward to a little rest and a restful trip back and see you when we get there.

CAPCOM Right. You've earned it.

PAO That exchange was between Donald K., Deke, Slayton, Director of Flight Crew Operations at the Manned Spacecraft Center and astronaut Nell Armstrong.

CAPCOM Hello, Apollo 11, Houston. We'd like you to turn off 02 tank number 1 heaters. Over.

SC It's off. Thank you.

CAPCOM Rog.

CAPCOM Hello, Apollo 11, Houston. For your information, the LGC in Eagle just went sailing up about 7 hours. Over.

SC Okay. It's very good, then (garbled), death of a real winner there. Charlie, we're going to rotate about pitch 270 degrees on the way home vice 1 - or 090 on the way out. Right?

CAPCOM Right, sir.

SC Okay, We're reporting in a maneuver to that attitude is in progress.

CAPCOM Rog.

SC Houston, this status report Radiation CDR 11017, CMP 10019, LMP 09020. No medication.

CAPCOM Say again, please, Neil. You were breaking up. We missed that. Over.

SC Okay. This is crew status report. Radiation CDR. 11017, CMP 10019, LMP 09020. No medication.

CAPCOM Roger. Thank you. And we didn't get any crew status report from you this morning. Wondered if you could give us an estimate of sleep last night. Over.

SC (Garbled) Okay. I'll take a guess at 10, 11 and try to give us (garbled)....CDR 3 and LMP 4.

CAPCOM Roger. Thank you very much.

SC And Charlie, you want the (garbled) cycling, right?

CAPCOM That's affirmative and we'd like you to disable our quads Charlie and Delta. Over.

CAPCOM Apollo i1, Houston. If it's convenient, we'd like to go through your onboard readout. Over.

SC Of what?

CAPCOM Oh, excuse me. It's on the flight plan 3102. We'd like to have Bat send RCS. Over.

SC Ready to copy it?

CAPCOM Roger. Go ahead.

SC That's Charlie 370, pyro bat A 370, bat B 370, RCS 55, 65, 64, and 62. Over.

CAPCOM Roger. We copy all that. Thank you much.

CAPCOM Apollo 11, Houston. A couple of questions for the moon walkers, if you got a second. Over.

ARMSTRONG Go ahead.

CAPCOM Roger, Neil. We're seeing some temperature rises on the passive seismic experiment that are a little higher than normal and were wondering if you could verify the deployed position. We understand it is about 40 feet from the LM in the 11 o'clock position B. Over.

ARMSTRONG No, it's about in the 9 or 9:30 position and I'd say it's about 50 or 60 feet.

CAPCOM Roger. Copy. Also did you notice, was there any indication of any dust cloud as you lifted off? Over.

ARMSTRONG Not very much. There was quite a bit of Kapton and parts of the LM that went out in all directions and usually in the same distance as far as I can tell, but I don't remember seeing anything of a dust cloud to speak of.

CAPCOM Roger. I understand all you could see was parts of the LM going out. What was your first comment? Over.

ARMSTRONG I don't remember. Just say Kapton and other parts of the LM of staging scattering all around the area for great distances but I didn't see dust.

CAPCOM Right. Thank you very much.

PAO This is Apollo control at 137 hours, 27 minutes. At this time, Apollo 11 is traveling at a speed of about 4982 feet per second. At about 5900 nautical miles from the moon, and about 198 900 nautical miles from earth. A short while ago, you heard Neil Armstrong make a few descriptive comments of the scene on the lunar surface at the time the planned ascent stage lifted off. Armstrong reported seeing very little dust, but quite a bit of debris from the LM. He referred to the Kapton, which is a plastic-like insulation material generally silver or gold in color which is found on the outside surface of the LM. And, we also had a report at 136 hours, 54 minutes, about 40 minutes or so ago, that the LM guidance computer had finally stopped putting out any data, and that was about 7 hours, 13 minutes after the primary guidance system was deprived of the coolant, in a test of how the system would continue to operate without coolant. The platform apparently begin to become unusable after about 4 hours and the computer itself finally gave up after about 7 hours and 13 minutes. Both items going considerably, considerably longer than had previously been predicted. The lunar

module ascent stage still in lunar orbit. We are continuing to get data from it. All other systems appear to be functioning well at this time. The LM orbit we show is currently 64.4 nautical miles for height of apocynthion, 54.4 nautical miles for pericyynthion. And the LM is in its 23rd revolution, and here's a call to the crew.

CAPCOM Over.

SC Thank you, Charlie, and I think we'll bring you up to date on our chlorination status. In compartment B4, we have 1, 2, 3, 4, 5, 6, 7 - correction - we have 8 pockets for chlorine and buffer ampules of which - let me correct that. We have 7 pockets of which one is empty and always has been empty, leaving 6 remaining. In the other side, over there in the BT, we have another container with 7 pockets, so we have a total of 7 plus 6 and those are filled with 6 chlorines and 7 buffers. Now I've been using one chlorine and one buffer per day which, at this point and time, prior to this chlorination I'm about to do, leaves me one chlorine and two buffers. Seems to me I'm one chlorine short, and that being the case, I'd like to ask your advice on postponing this chlorination using the last container until some later date like maybe tomorrow. Over.

CAPCOM Roger. We copy, Mike. Stand by.

CAPCOM Hello Apollo 11, Houston. Check in A1, Mike, and see what you can find in there. Over. We think you might have some more chlorine up in A1. Over.

CAPCOM Hello Apollo 11, Houston. Apollo 11, Houston. Do you read? You're breaking up. Over.

SC Roger. We hear.

CAPCOM Roger, 11. You're breaking up. Mike, please look in component A1. We think there might be some more chlorine up there. Over.

SC Eureka!

CAPCOM 11, Houston. Reading you about 1 by. Over.

CAPCOM Apollo 11, Houston. We're having a downlink problem, the reason we can't read you. We're switching sides. Stand by. Hello Apollo 11, Houston. How do you read now? Over.

SC Fine.

CAPCOM Rog. You're 5 by on that too, Mike. Thank you much. Did you copy that about A1 on that chlorine?

SC Eureka!

CAPCOM How about that, sports fans?

CAPCOM Apollo 11, Houston. We're having a little trouble getting the yaw rate damped out to the appropriate value. We'd like you all to be quiet like mice for a couple of minutes and let's see if that'll help it out. Over.

CAPCOM 11, Houston. You did great work there. We're ready to spin it up. Over.

CAPCOM 11, Houston. Did you copy? Over.

SC Yes. We read you, Charlie? Would you stand by a minute?

CAPCOM Roger. No hurry.

CAPCOM 11, Houston. Shift change time here. White team bids you good night. We'll see you tomorrow. Over.

SC Okay, Charlie. Thank you.

SC Night, Charlie. Thank you.

SC Adios.

CAPCOM Adios. Thanks again, for a great show, you guys.

SC Thanks for a great show down there.

PAO This is Apollo Control at 137 hours 52 minutes. Apollo 11 crew has signed off for the night, starting a well-deserved rest period. Duration of the rest period is programmed for 10 hours, however, the wake up time is not critical. It's very likely that we'll let them sleep 'til they wake up of their own accord. At this time Columbia is 7,045 nautical miles away from the moon, headed toward home at a velocity of 4,868 feet per second.

PAO This is Apollo Control at 138 hours 02 minutes. CAPCOM Owen Garriott has just put in a call to the crew and is passing up some antenna information to them. Here's that conversation.

CAPCOM Howdy there, Mike. We're ready to go ahead and have you put your OMNI position for your sleep period, and we would like the following high gain put positions: your high gain antenna in MANUAL, beam was WIDE, pitch is minus 50, and yaw is a plus 270 and just follow the flight plan for remaining comm configuration. Over.

SC Roger. (garbled)...pretty hard.

CAPCOM Your comm is pretty weak at this point, Mike. Please say again.

SC Roger. (Garbled).

PAO That coming at 137 hours 55 minutes elapsed time. At that time the battery power fell below the level where the secondary guidance system could hold the attitude of the vehicle within the steerable of antenna limits. We do not expect to establish contact with Eagle again. We'll continue to stand by here live. There may be a bit little more conversation before the crew turns in for the night.

CAPCOM Apollo 11, Houston. We'd like for you to go ahead and put on S-Band antenna OMNI to OMNI and OMNI B. Over.

CAPCOM Apollo 11, Houston. How do you read me through Honeysuckle now? Over.

SC You're loud and clear. Over.

CAPCOM Very good. Reading you better now and did you copy we'd appreciate going S-Band OMNI and OMNI B at this time? Over.

SC Roger. (Garbled).

CAPCOM Okay, thank you.

SC (Garbled).

PAO This is Apollo Control at 138 hours 11 minutes. We do not intend to contact the crew during this rest period again. We will take this lying down now and come back up if there is further conversation. This is Mission Control, Houston.