

Apollo 11 Highlights Day 7

PAO ...okay, entry conditions which is, would primarily be for corridor control, controlling the flight path angle at entry. And the current predicted splash time in the Pacific is 195 hours 17 minutes 25 seconds. At the present time Apollo 11 is 172,654 nautical miles from the Earth, traveling at a speed of 4017 feet per second. We estimate that the spacecraft will be half way home at a ground elapse time of 159 hours 53 minutes 43 seconds. At that point the spacecraft will 145,583 nautical miles from the Earth's surface, and we will have completed half of the return trip measured from lunar orbit insertion to splashdown. Now we also have another figure that would be for the time of which the spacecraft velocity is equal with respect to both the Earth and the moon. At that point the velocity will be 4300 feet per second with respect to both bodies and we would define this as the equal potential point and that will occur at 155 hours 30 minutes and at that time the spacecraft will 156,874 nautical miles from the Earth, 52 543 nautical miles from the moon. We're now 1 hour 28 minutes 26 seconds from ignition for the midcourse correction 5 maneuver.

CAPCOM Apollo 11, this is Houston. Over.

SC Roger, go ahead Houston.

CAPCOM Roger, if Neil has a free minute, we've got a question or two regarding the CO₂ partial pressure and water in the suit loop discrepancy noted yesterday. Over.

SC Go ahead.

CAPCOM Roger, 11. Was water noted in both suits or only in yours, Neil?

SC I think only in my suit.

CAPCOM Okay, can you locate that occurrence for us in time when you first noticed water in the suit either by mission time or relation to any particular event?

SC I think it was after insertion sometime, Bruce. I don't remember exactly when. It was when we were in orbit and had our, after we took our helmets off.

CAPCOM Roger, did you call it to us when you first noticed it, or was it sometime after when you called us?

SC It just might have been probably 20 minutes after I noticed it that I mentioned it to you.

CAPCOM Roger. Was this noticing the water accompanied by your erratic CO₂ partial pressure readings or was that a separate problem? Over.

SC Well, the water problem evidenced itself before we noted any erratic motion the PCO₂ gauge.

CAPCOM Roger. What was the relative sequence on selecting water separator number 2 and the secondary CO₂ canister - that is, did you go to the secondary water separator first and then the secondary CO₂? Over.

SC I believe we went to secondary CO₂ first.

CAPCOM Roger, we copy. Was there any change in your suit loop count?.

SC Now...

CAPCOM Go ahead.

SC I should mention, Bruce, that when I went to water secondary, water separator to secondary that. I didn't notice any change, but about after 15 minutes or 20 minutes the water stopped coming out. So, maybe that was just water that was already in the loop that was still blowing out, but the secondary water separator was operating properly.

CAPCOM. Roger, did you make any changes in the suit tube configuration after you went from the egress mode to the cabin mode after insertion - that is, in particular, they're interested in knowing if you recall changing the diverter valve position to egress any time while you were on the secondary canister? Over.

SC No, I don't believe we did that at all, Bruce.

CAPCOM Okay, 11. Thank you. That sums up our questions for now and we'll crank these back into the engineering pipeline and see what we can come up with.

SC Okay. Are you satisfied that the CO₂ circuit breaker was in (garbled)?
Over.

CAPCOM Say again, please.

SC Roger. In LM jettison, are you satisfied that the CO₂ circuit breaker was in?
Over.

CAPCOM Yes, it was in.

SC Roger, could you confirm that? I thought there was some question after we got into the command module as to whether that had been left in or not. Over.

CAPCOM Roger, 11. It was in and confirmed in, and the readings after jettison say about .1 to .2.

PAO This is Apollo Control at 149 hours, 41 minutes. We're now about 49 minutes away from the first midcourse correction of this transearth leg of the Apollo 11 flight. That maneuver will be a 4.8 foot per second burn of the spacecraft reaction control system thrusters and is scheduled to occur at a ground elapsed time of 150 hours, 29 minutes 54 seconds. At this time Apollo 11 is 171,017 nautical miles from the earth and the spacecraft velocity is 4043 feet per second.

SC Houston, Apollo 11. Over.

CAPCOM 11, this is Houston. Over.

SC Roger. I wonder if you have noticed any change in the biomed returns sign you're getting? Over.

CAPCOM Negative, Buzz. Still looks kind of bad. Apparently when you move around, it's cutting in and out. Have you checked the little electrical connector where it goes into the signal conditioner? Over.

SC I did. They're all about as tight as can be. I tell you what I'll, I'll take them out and put them back on again to see if that makes any difference.

CAPCOM Okay, if you would at your convenience. We'll be watching it down here.

PAO This is Apollo Control at 150 hours 4 minutes. Telemetry data at this time shows the spacecraft in the proper attitude for the upcoming midcourse correction maneuver. The crew will soon be verifying their attitude by taking a sighting on a star through the sextant and then be running some tests on the guidance and control system and the reaction control system before the maneuver takes place. That burn now scheduled to come a little over 25 minutes. Apollo 11 is now 170 102 nautical miles from the Earth and the spacecraft velocity is 4058 feet per second.

CAPCOM Apollo 11, this is Houston. We'd like you to try acquisition on the high gain antenna for us at PITCH minus 90, YAW 270. Over.

SC Roger. Got us some work.

CAPCOM Roger, out.

CAPCOM 11, this is Houston. We're showing about 6.8 percent on waste water on our telemetry now. Over.

SC Okay, we've got about 9 up here. Over.

CAPCOM Roger, out.

CAPCOM 11, Houston. We're standing by for your burn. Everything's looking good from down here.

SC Thank you Bruce. You've got about a minute and 20 seconds.

CAPCOM Roger, we concur.

PAO One minute until midcourse correction number 5. It will be a 10.9 second burn of the spacecraft reaction control system thrusters giving a change of velocity retrograde of 4.8 feet per second. The primary purpose of this maneuver will be to control the spacecraft flight path angle at entry interphase. We're now less than 30 seconds from the initiation of the burn.

PAO They should be burning at this time.

PAO And we show the burn off.

SC Houston, do you copy our residuals?

CAPCOM Roger, we've got your residual fuel count reading for us.

SC DELTA VC is plus .2.

CAPCOM Roger. Plus .2.

SC It was actually plus 100.2. Okay?

CAPCOM Okay.

PAO That midcourse correction was performed at a distance of about 169,000 nautical miles from the Earth at a spacecraft velocity of 4075.6 feet per second.

PAO This is Apollo Control at 150 hours 35 minutes. Our telemetry data here on the ground shows that a midcourse correction maneuver, just about nominal, burn duration 10.5 seconds. Prior to the maneuver, we were predicting a splashdown time of 195 hours 17 minutes 25 seconds. And we expect there will be some modification to that after we've had a chance to do some tracking following this midcourse correction maneuver. Apollo 11 is now 168,843 nautical miles from the earth traveling at a speed of 4078 feet per second and we're continuing to see a very slow buildup in the velocity.

SC Houston, Apollo 11.

CAPCOM Go ahead, 11.

SC Roger. We're in FTC attitude and would you please give us a call when our thruster activity has subsided sufficiently?

CAPCOM Roger, stand by.

CAPCOM Apollo 11, this is Houston. We're going to hand over from Madrid to Goldstone at 151 hours even. If you should lose lock on the high gain at this time, you may require at PITCH minus 45 yaw 270. Break. We're still watching your rates. Over.

SC Okay. Thank you.

CAPCOM Apollo 11, this is Houston, over.

CAPCOM Apollo 11, this is Houston, over.

SC Go ahead, Houston.

CAPCOM 11, we're still seeing rates on your spacecraft above those we would like for and the continuation of the PTC mode which we are still monitoring it and we'll advise you when it has settled down, over.

SC Okay.

PAO This is Apollo Control at 151 hours 11 minutes. The crew is presently setting up the spacecraft for passive thermal control. Once it stabilizes out it will begin a slow roll rate of three revolutions per hour to maintain temperature control. At the present time Apollo 11 is 167,448 nautical miles from the Earth and the velocity is 4101 feet per second.

CAPCOM Apollo 11, this is Houston. You are Go for the set up on PTC, over.

SC Thank you.

SC Houston, Apollo 11, over.

CAPCOM Go ahead 11.

SC It didn't like it that time. When I got down to the entry 27303 enter, it took off in roll at a high rate in excess of one degree per second. Over. That stopped it now and we are going to have to go back and do it over again. I'd like to try find out the reason it did that.

CAPCOM Roger. You might as well start setting up for it and we will be working the problem here.

SC Okay. You do have us on high bit rate here now?

CAPCOM That's affirmative.

SC Okay, good. I'll maneuver back to PTC Ignition Attitude while you guys look at the data and see what you think.

CAPCOM Roger.

SC Houston, Apollo 11. I think the reason is in having 1620 on the DSKY during the subsequent entry or at least that's one possibility.

CAPCOM Roger. We'll check it out.

CAPCOM Apollo 11, this is Houston. While you're waiting for the CSM to settle down and for us to look at the tapes on your latest maneuver, would you feel like answering some more questions with relation to the lunar surface? Over.

SO Go ahead.

SC Go ahead, Bruce.

CAPCOM Roger. For 64,000 dollars we're still trying to work out the location of your landing site, Tranquility Base. We think it is located on LAM2 Chart at Julia .5 and 7.8. Do you still have those charts onboard? Over.

SC Stand by one. They're packed.

CAPCOM Roger. You may not have to unpack it. The position which I just gave you is slightly west of Wess Crater. I guess it's about two tenths of a kilometer west of it and we were wondering if Neil or Buzz had observed any additional landmarks during descent lunar state or ascent which would confirm or disprove this. One thing we're wondering about is that if you were at this position, you would have seen the Cat's Paw, during the ascent just up to the north of your track. Over.

SC We were looking for the Cat's Paw too, thinking we were probably downrange beyond the Big Z. But I think that it's likely that that might have been Wess Crater that we went across in landing, but, stand by.

SC We're hoping, Bruce, that our 16 millimeter film was working at that point in descent and we'll be able to confirm our touchdown position. We thought that during

ascent we might be able to pick up some recognizable objects close to the landing site, and we did see a number of small craters and crater rows and things like that, which we may be able to pick out after the fact, but we haven't been able to yet.

CAPCOM Roger. And the next question from our panel is for Buzz. We recall that he reported seeing a laser upon AOS of the Earth the first time after, the first rev after ascent, and we're wondering what color the beam was and if he could determine at the approximate location with respect to the Earth. Over.

SC It was mostly white, perhaps a tinge of yellowish color to it, and it seemed to be, as I recall it, the terminator of the Earth was toward the horizon and seemed to be about a quarter to a third of the way down from down toward the terminator of the Earth from the opposite horizon. That's a third to a quarter of the Earth's radii. Over.

CAPCOM Roger, and that puts it in the light side? Over.

SC Roger. Yes, it was in the light side. The Earth was about 2/3 lit, Earth, with the terminator down toward the horizon. And now, coming from the opposite LM of the Earth, the sunlight LM, coming down about one quarter to one third of a radius in from the LM. Generally, ESSENTIALLY located with respect to a line drawn perpendicular to the terminator that goes through the center. Over.

CAPCOM Roger, Buzz; we copy.

SC And I got pictures of that. I'm sure that will show up.

SC And I saw, I saw that too. It was a very bright spot of light and I confirm Buzz's observation of its position.

CAPCOM Okay, 11, very good. Now with respect to the documented sample container on television it appeared to us as though the samples for that container were in fact being, given, being selected in accordance with some thought or consideration being given to the rocks themselves, and we were wondering if you could give any further details from memory about any of these samples and the context of the material or the surface from which they were taken. Over.

SC Yes, you remember I initially started on the side of the LM that the TV camera was on and I took a number of samples of rocks off the surface and several that were just subsurface and about 20, 15 to 20 feet north of the LM. And then I recalled that that area had been probably swept pretty well by the exhaust of the descent engine, so I crossed over to the southern side of the LM and took a number of samples from the area around the elongate double crater that we commented on and several beyond that and tried to take as many different types, of rock types as I could see by eye as I could in the short time we had available. There were a number of other samples that I had seen earlier in our stroll around the LM that I had hoped to get back

and pick up and put in the documented sample, but I didn't get those and I'll be able to comment in detail when we get in the debriefing session.

CAPCOM Roger. Did you observe any small craters with conspicuously blocking rims? Over.

SC Well, aside from the great big one that we went over, I guess there were none in our area. I took a stroll back, after putting up the PSEP and all. Buzz was starting to unpack the documented samples, took a stroll back to a crater behind us that was maybe seventy or eighty feet in diameter and fifteen or twenty feet deep and took some pictures of it. It had rocks in the bottom of pretty good size, considerably bigger than any that were out on the surface but there was no, we apparently at fifteen feet or so had not got below the regalus. We were essentially showing no bedrock, at least in the walls of the crater at that depth. Over.

CAPCOM Roger. We copy. Okay, thank you, Neil. That about wraps up the questions we have on hand for now.

SC Okay.

SC My compliments to the chef. The food's outstanding. This cream of chicken soup, I give at least 3 spoons.

CAPCOM Okay. Cream of chicken, 3 spoons.

CAPCOM Apollo 11, this is Houston. Over.

SC Go ahead.

CAPCOM 11. We e concur that having VERB 16 NOUN 20 up on the DSKY may well have had some effect, on your PTC initiation. It looks like this would give, let the computer work with the knowledge of the axle, PDU angles. What we'd like you to do is do a CDU 0 which is VERB 4 O NOUN 20 ENTER and then start the PTC procedure again at step 2 with loading VERB 6922 desired attitude in the AUTO maneuver and all that. OVER.

SC Okay. The only I don't understand about that is why it took off at the rate it did. What rate should it had taken off at under that theory?

CAPCOM Stand by a minute, Mike.

CAPCOM 11, CMB, this is Houston. Over.

SC Go ahead, Houston.

CAPCOM Mike, over here on page 9-7 of your checklist where we're setting up PTC, there's been a note penciled in after wait 20 minutes for rate to damp. Do not monitor a VERB 16 NOUN 20. It turns out that the significance of that is that if you are monitoring 16 NOUN 20 then when you get down here in step 7, the second time you do a VERB 24 you've got to reload the NOUN 01 to make it VERB 24 and NOUN 01 ENTER before you load the three registers. Over.

SC Roger that. I was just questioning the rate at which the maneuver would begin if that were not done.

CAPCOM Roger. We're still working on computing the rates for you.

PAO This is Apollo Control at 152 hours 9 minutes. At this time, the crew is getting the spacecraft set up to reinitiate the passive thermal control. Apollo 11 currently 165,143 nautical miles from the earth and traveling at a speed of 4,142 feet per second. The flight plan has relatively few activities scheduled for now through the beginning of the crew sleep period tonight. We do have a television transmission scheduled. I believe, the time on that is a little after 8:00 P.M. Central Daylight Time. And we show the sleep period to begin at about 160 hours Ground Elapsed Time or a little less than 8 hours from now. We'll continue to stand by for any conversation with the crew. It has been relatively quiet for a good part of today. We'll stand by for a call from the CAPCOM or from the spacecraft down to the ground.

CAPCOM Apollo 11, Apollo 11, this is Houston broadcasting in the blind. If you read us attempt to acquire on OMNI antennas, attempt to acquire on OMNI antennas, if you read. This is Houston, out.

CAPCOM Apollo 11, Apollo 11, this is Houston broadcasting in the blind, do you read? Our contact position on an OMNI antenna, our contact position using an OMNI antenna. Over.

CAPCOM Apollo 11, Apollo 11, this is Houston broadcasting in the blind. If you read attempt to contact using an OMNI antenna. This is Houston. Out.

PAO This is Apollo Control at 152 hours 29 minutes. In the process of reestablishing the passive thermal control with the spacecraft in a slow rotation, we have apparently lost high gain lock on and we expect that the crew will reacquire lock with the antenna once the passive thermal control is reestablished. At the present time Apollo 11 is 164 thousand 320 nautical miles from the earth and the velocity is up now to 4 thousand 156 feet per second. We'll continue to stand by here for reacquisition of the spacecraft, for reestablishment of high gain lock on.

CAPCOM Apollo 11, Apollo 11, this is Houston broadcasting in the blind. If you read us attempt to acquire on OMNI antennas, attempt to acquire on OMNI antennas, if you read. This is Houston, out.

SC Hey, Goldstone

CAPCOM Apollo 11, this is Houston. How do you read, over?

SC Loud and clear, Bruce.

CAPCOM Roger, what antenna are you using?

SC Houston, Apollo 11 has gone into high gain. How do you read, over?

CAPCOM Well, you are loud and clear on the high gain.

SC So what's new?

CAPCOM Oh, we were wondering what was new with you up there?

SC Oh, very quiet. We're just sitting here letting the thruster firing damp down when they, Houston, let us know and we will start this PTC.

CAPCOM Roger.

SC Nice to sit here and watch the Earth getting larger and larger and the Moon smaller and smaller.

CAPCOM Roger. We'll give you a call when your rates have damped down sufficiently and we are unable at the present time to predict what rate you should have seen at your last attempt in initiate PTC. We saw about 2 1/2 degrees per second, over.

SC Yah, I believe that.

SC Buzz thinks we should have a PTC program built in the computer. He could very well be right.

PAO This is Apollo Control at 153 hours, 7 minutes. At the present time, we are changing shifts here in Mission Control. Flight Director Gene Kranz will be coming on to relieve Flight Director Clifford Charlesworth. The Capsule Communicator on this shift will be astronaut Charlie Duke. There will be a change of shift briefing in the news center, in the building 1 auditorium in about 10 minutes. At the present time, Apollo 11 is traveling at a speed of 4,185 feet per second. The spacecraft is about 162,700 nautical miles from the earth. During the change of shift briefing, we will take the circuit down, record any conversation that develops with the spacecraft and play it back following the change of shift briefing. At 153 hours, 9 minutes this is Apollo Control, Houston.

PAO This is Apollo Control. 153 hours 49 minutes Ground Elapsed Time. Apollo 11, homeward bound, is now 161,015 nautical miles out from Earth. Velocity now 4216 feet per second. Some 3 1/2 minutes of recorded air to ground transmissions have accumulated during the recent Change of Shift Press Conference here in Apollo News Center. Let's play that tape back now.

SC Houston, Apollo 11.

CAPCOM Go ahead, 11.

SC Rog. I was just checking the radios and how is the thruster activity coming?

CAPCOM 11, Houston. The radios are still in good shape and we are still waiting for your rates to decay. We got .03 degrees per second in pitch now.

SC Okay. We're in no rush. This is a very pleasant attitude as a matter of fact, the sun is down in the LEB so it is not shining through the windows and heating the place up. We've got the Earth steady out window 1. We have the moon steadily out window 3 and of course be are locked up on the high gain, so as long as the thermal people are happy, we are happy.

CAPCOM Roger, we copy.

CAPCOM Apollo 11, this is Houston, over.

SC Go ahead, Houston.

CAPCOM Okay, 11. We are about ready to start PTC. I'd like to give you some high gain antenna angles though. We would like to operate in the react mode and if you plan on spinning up in the positive or negative direction, over?

SC We can do it either way. I had planned the positive.

CAPCOM Okay, for positive the high gain antenna setting should be pitch plus 30, yaw 270, and in react, over.

SC Understand. React pitch plus 30, yaw 270. Thank you.

CAPCOM Roger, and if you would when you are making your DSKT entries to set up for PTC, go a little slower and we will try to follow each entry from down here. Over.

SC Roger that.

SC Houston, 11. PTC established.

CAPCOM Roger, 11.

CAPCOM 11, Houston. We observed that PTC is fairly well established here and we'll keep you posted on how it's going and your friendly white team commentator is taking over now.

SC Okay, thank all your black team.

CAPCOM That was the green team.

SC Correction, all your green team – correction green team. Excuse me.

CAPCOM Roger, out.

SC How could I forget! I used to be a green one.

CAPCOM Hello Apollo 11, Houston. Your white team is now on. We're standing by for an exciting evening of TV and a pre-sleep report, over.

CAPCOM Apollo 11, Houston. Are you sure you don't have anybody else in there with you?

SC Houston, Apollo 11. Say again, please.

CAPCOM We had some strange noises coming down on the downlink and it sounded like you had some friends up there.

SC Where, where do the white team go during their off hours anyway?

CAPCOM Say again.

PAO This is Apollo Control. Still no explanation, the weird noises emanating from Apollo 11, if indeed it is from Apollo 11. And it's reported from network that it's being received on the downlink at two different stations in the Manned Space Flight Network. Perhaps it will all shake out later in the mission as to what these strange noises are. We'll come back up again as conversation is resumed with Apollo 11 now 160,410 nautical miles out from Earth traveling at 4228 feet per second. At 154 hours, 5 minutes ground elapsed time this is Apollo Control.

PAO This is Apollo Control 154 hours, 53 minutes ground elapsed time. 40 hours, 9 minutes to entry. Apollo 11 homeward bound 158,378 nautical miles out from Earth. Velocity now 4267 feet per second. We have some 3 minutes of tape accumulated over the past half hour of minor conversations with the crew of Apollo 11. We'll roll these tapes now.

CAPCOM Apollo 11, Houston. Over.

SC Roger.

CAPCOM Roger. Would you, we've lost comm with you for about the last ten minutes. Would you verify that the S-band track switch is in REACQ? Over.

SC Negative. It's not. The last time we broke lock, we went to AUTO and I left it there. Sorry.

CAPCOM Roger. We'd like you to put it in REACQ then monitor in about two minutes we'll be coming up on the high gain, would you monitor the REACQ if it doesn't take, acquire manually? Over.

SC Okay. Say again the angles you'd like?

CAPCOM We'll try to switch it ourselves. Stand by on the angles.

CAPCOM Buzz, it's Pitch plus 30 yaw 270. Over.

SC Roger, I've got them, Capcom. Thank you.

CAPCOM Hello Apollo 11, Houston. Would you please terminate battery charge now? Over.

SC Roger. Terminating battery chargers.

CAPCOM Roger.

CAPCOM Hello Apollo 11, Houston. Any special attitude you'd like us to look at for the TV? Over.

SC I don't guess we have a requirement to (garbled).

CAPCOM Roger. We have an attitude that we can get the Earth out of a window or the moon. We're trying to look at, find that we can get both if that's what you'd like. Over.

SC A 50 degree roll attitude would probably give us that, Joe.

CAPCOM Roger.

SC That's a good one because it puts the earth out window 1 and the moon out window 3 and puts the sun down the LEB so the lighting in here remains rather constant.

CAPCOM Rog. Well, we'll just stop on the 50 roll then and we'll give you the word when to do that. Over.

SC Okay.

PAO This is Apollo Control. That completes the accumulation of air to ground communications by means of tape recordings on the last half hour or so. It's quiet right now. No conversation going on between Spacecraft Communicator Charlie Duke and the crew of Apollo 11. And at 154 hours 57 minutes ground elapsed time this is Apollo Control.

PAO This is Apollo Control, 155 hours, 27 minutes ground elapsed time. Coming up now about 3 minutes away from tonight's television pass. It'll be through the 85-foot antenna at the Goldstone tracking station. The 210 foot dish out there is tied up tracking one of the Mars fly-by missions. We have some 20 seconds of tape accumulated. We'll play that back and rejoin the conversation line.

CAPCOM Apollo 11, Houston. We'll have high gain coverage about 155:30. At that time, you can turn on the TV if you desire and continue your roll around until you get 50 degrees roll. Over.

CAPCOM Apollo 11, Houston. We were going to give you the all-star game tonight, but it was rained out. Over.

SC Sorry to hear that.

CAPCOM 11, Houston. We're on the high gain. You can warm up the SM if you like. Over.

PAO This is Apollo Control still standing by for the incoming television signal from Columbia. Still nothing but the color bar test pattern as of now. Continuing to stand by on air to ground and television links.

CAPCOM Apollo 11, Houston. We see you coming up on 50 roll. How does that attitude look? Over.

CAPCOM Apollo 11, Houston. We're ready for the TV. We're all configured. At your convenience. Over.

PAO This is Apollo Control. While we're waiting for the television pictures to come in, we have in the control room here a vase full of long-stemmed red roses, the card saying, "To one and all concerned. Job superbly done. From a moonstruck Canadian." Continuing to stand by as we wait for the pictures to come from Columbia. Here they come.

SC Houston, Apollo 11. Over.

CAPCOM Roger. Go ahead, 11. Over.

SC Are you picking up our TV signal?

CAPCOM That's affirmative. We have it up on the eidophor now. The focus is a little bit out. We see the Earth in the center of the screen, still have a little white dot in the bottom of the camera apparently, and see some land masses in the center. At least, I guess that's what it is. It's very hazy at this time on our eidophor. Over.

SC Let me change, believe that's where we just came from.

CAPCOM It is, huh? Well, I'm really looking at the bad, at a bad screen here. Stand by one. Hey, you're right.

SC It's not bad enough (garbled).

CAPCOM What?

SC I said it's not bad enough about finding the right landing spot. We weren't looking at the right planet.

CAPCOM I'll never live that one down.

SC We're making it get smaller and smaller here to make sure that it really is the one leaving.

CAPCOM That's enough, you guys.

CAPCOM Eleven, that was a good picture there.

SC Okay, that's enough of the moon.

SC Okay, that's enough of the moon, Charlie. We're getting set up for some inside pictures.

CAPCOM Right.

SC We've know there's a lot of scientists from a number of countries standing by to see the lunar samples and we thought you'd be interested in seeing that they really are here. These two boxes are the sample return containers. They're vacuum packed containers that were closed in a vacuum on the lunar surface, sealed and then brought inside the LM and then put inside these fiberglass bags, zippered and resealed around the outside, and placed in these receptacles in the side of the command module. These are the two boxes and as soon as we get onto the ship I'm sure these boxes will immediately be transferred and delivery started to the Lunar Receiving

Laboratory. These boxes include the samples of the various types of rock. The ground mass is the soil, the sand and silt and the particle collector for the solar wind experiment and the core tubes that took depth samples of the lunar surface.

CAPCOM Roger. Neil, thank you much for that description. We've got a pretty dark picture down here could you set your F-stop? We'd like to have it, see if you can open it up a little bit, over.

SC Okay, our monitor showed that to be very bright.

SC We're down between, well, around F4 which we thought would be plenty right. We'll lighten it up some more.

CAPCOM Well, we'd appreciate it. It's pretty dark on all our monitors here.

SC Okay, fine.

CAPCOM That's looking a lot better now, Neil.

CAPCOM There's Buzz.

CAPCOM 11 Houston, we have an excellent picture now, over.

SC Okay, how do you read me, Charlie?

CAPCOM 5 by now, Buzz, over.

SC Okay. The more mundane affairs, now that we've touched the moon, I'd like to trace through a little bit for you the developments that have taken place in the food department. I'm sure you've already seen this type of a drink container. A little later Mike will show you how the water gun operates with its new filter to take out the hydrogen. Essentially this water gun is put in this hand and filled up this bag with water and the drink then dissolves in the water and this end of the out feeding. Likewise we have other foods that are more solid nature. You can probably see this shrimp cocktail meal, this afternoon, while the two of us had salmon salad. Another early development was the use of bite size food.

CAPCOM Eleven, Houston, Buzz, you're breaking up badly, will you check your vox, over.

SC Roger, how am I coming through now, Charlie?

CAPCOM You're very clear when you come through. It's just that your vox is not keying at every word, over.

SC Okay. These bite size objects were designed to remove the problem of having so many crumbs floating around in the cabin so they designed a particular size that would be able to go into the mouth all at once. I think since all of our experience we've discovered that we can progress a good bit further than that back to some of the type meals that we have on Earth. As a matter of fact on this flight we've carried along pieces of bread and along with the bread we have a ham spread and I'll show you, I hope, how easy it is to spread some ham, while I'm in zero g. I think we've discovered that it is quite easy to...you're all very familiar with.

CAPCOM Apollo 11, Houston. We notice your roll rate increasing. Will you please see if you can bring that down to about 04 so we'll be losing a high gain shortly? Over,

SC You can also use zero gravity to demonstrate many things that we've all learned in school. I'd like to demonstrate briefly how easy it is to explain the action of the gyroscope. If I spin this can we know that according to the equations of motion that we would expect that it, once this is given a spin about, and has a spin axis in this direction, if we give it a particular torque, and if, I'll do this by pushing my hand against it in this fashion once its spinning, by the equations we can predict, that if I put this torque on it, it will in fact rotate this direction. Let's see how well this works out. See if I apply the torque this way, its rotated this way.

SC Too close, I think?

CAPCOM 11, Houston. It's a pretty good demonstration.

SC Houston this next is a little demonstration for the kids at home, all kids everywhere for that matter. I was going to show you how you drink water out of a spoon but I'm afraid I fill the spoon too full and if I'm not careful, I'm going to spill water right over the sides. Can you, can you see the water slopping around on the top of the spoon, kids?

CAPCOM That's affirmative, 11.

SC Okay, well as I said, I was going to tell you but I'm afraid I filled it too far and its going to spill over the sides. I'll tell you what. I'll just, I just turn this one over and give me the water and start all over again. Okay?

CAPCOM Okay.

SC And you can see, up here we don't know where over is. One up is as good as another and that really is water, I tell you.

SC That's really not the way we drink. We really have a water gun which I'll show you. Here's the water gun. This cylindrical thing on the end of it is a filter with several membranes. One allows water to pass but not any gas; the other allows gas to pass but

not any water so by routing the gaseous water, which comes from our tank, through the filter we're able to drink purified water without the gas in it, filtered water. And of course all we do to get it started is just pull the trigger. It's sort of massy. I haven't been at this very long. It's the same system that the Spaniards used to drink at a wine stand at the bull fights, only I think it'd be more fun.

SC We'll be seeing you, kids.

CAPCOM Thank you from all us kids in the world here in the MOCR, who can't tell the Earth from the moon.

SC Roger. Stand by one and we'll get you that (garbled).

CAPCOM Looks like you need a wine skin up there, Mike.

SC That'd be nice.

SC Okay. 11, Houston. You have a picture now, Houston?

CAPCOM That's affirmative. I refuse to bite on this one though. You tell us.

SC Okay. This should be getting larger and if it is the place we're coming up to.

CAPCOM Roger.

SC No matter where you travel, it's always nice to get home.

CAPCOM We concur 11. We'll be happy to have you back.