

ASTP (USA) MC704/1

Time: 12:38 CDT, 221:18 GET

7/24/75

DMP Okay, go ahead.

CC-H Okay. Currently with the amount of SDS we have available to us in our quads, we do not have a full 4-quad of completion capability. If our SDS delta V to go is greater than 169 feet per second, we're going to go around. In other words, if we have an SDS failure, and we still had delta V of greater than 169 we'd go ahead and go around the 6th REV. If it's less than or equal to 169 we can go ahead and complete per the chart here. And what we want you to do, is to draw a vertical line up from the bottom, starting at 169 and just make a little notation to the right of that, that just go around if you were in that particular case. To the left of it we can complete okay. We have RCS capability for 191 feet per second. That's where that line comes out in - on your graph there. And, if any of that's not clear, I want to discuss it with you.

DMP Okay, we'll throw it back at you. If we have 191 RCS, feet per second, RCS capability, slightly lower than normal, not much, we'd go around, well if we had to do a completion, and if to go was greater than 169 - stand by. Okay, and the to go was greater than 169, we'd go around, and if it's less than we'd complete. Very clear.

CC-H Okay. Real fine and - stand by 1. Yeah, and of course it's obvious to you, that if you don't get ignition on your SDS, that we will go around in that case, since we don't have a full four-quad capability.

CMP That's right.

CC-H Okay, that's all I had and you guys can go around getting all your little duties out of the road. And your OBS's on and all that thing, and get squared away. We're in good shape.

CMP Okay. Most of us have them on. We've been moving around so much, we've been off comm and (garble).

CC-H I am about a couple of - about ready to lose you on the ATS here, and what I'd like to do is get the pad's to you when we get to Vanguard and that's about 9 minutes away.

CMP Okay. We'll be waiting, happily for your pads.

CC-H Okay, fine. We've completed our loads and you can go ahead and go back to BLOCK, (garble).

CMP Okay. BLOCK.

CMP And, Crip, are you still there?

CC-H That's affirm.

CMP Okay, and we'll finish now the rest of the SM experiment, deactivation.

CC-H I'm sorry, I couldn't get that. Oh, deactivate the experiment. That's affirm, experiments has gotten all the data he can think to get out of it.

CMP Okay, and do you still want to leave the power switch on, EUV until further notice.

CC-H Negative. You can go ahead and do a complete power down at this time.

CMP Okay, very good.

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PAO Apollo Control. Ground elapsed time 221 hours, and 24 minutes. The start of the final entry checklist with command module pilot, Vance Brand. The final experiment completed. The crew is presently storing away the equipment, specifically, the Earth Observations Equipment, which they just concluded a very active pass over Europe. The retrofire with the SPS engine will occur at central day light time of 337 and 47 seconds, with splashdown now predicted at 4:19, 52 seconds, central daylight time. Experiment officer here at the mission control center coming up with some figures on total experimentation time during the ASTP Apollo mission. A total of approximately 300 hours both manned and unmanned operation of the various experiments. Leading the list would be furnace aboard, which was run for 121 hours, for 7 separate samples. The electrophoresis experiment, the German experiment, was operated for 2 hours - 2 and three-quarter hours. The electrophoresis experiment, that of the Marshall Space Flight Center, was operated for 8 and a quarter hours. The extreme ultraviolet experiment was operated for 19 hours. The helium glow experiment, total of 18 hours of operation. The X-ray, total of 1 hour. More than 12 hours of visual observation's conducted during the mission. The light flash experiment occupied 2 hours of crew time during the mission, and the biostack experiment, performed unmmanned, was operated a total of 36 hours. Dr. Farouk El Baz giving a report here that all experiment objectives was successfully accomplished on the Earth Observations and photography. The crew reported on both mapping camera operations and real time visual observations that was performed during 25 separate revolutions. A total of 11 mapping passes was scheduled and only 1 on revolution 15 had to be cancelled because of problems in the flight plan. A total of 60 visual observations sites were scheduled and the crew attempted to perform them all. It is estimated by Dr. Farouk El Baz that about 20 percent of 100 planned observations of the 60 sites were not performed due to bad weather. Coordination with ground truth parties went well. Pertinent inforamtion obtained from both aircraft flights and ships at sea, were relayed to the crew in real time for observation of specific sites surveyed on the ground. Two extra passes were scheduled in real time, on revolution 106 and 121, for the observation of possible Red Tide booms off the coast of Maine. In addition to planned observations, the crew reported on targets of opportunity, including large numbers of eddies near the Hawaiian Islands. A possible volcanic eruption on comendorsky Island at the west end of the Aleutain Chain, and other sites. TV transmissions were acquired over several tracking stations, and images of the daylight portion of REV 124 were recorded on the video tape recorder. This imagery will be valuable, both to scientific investigations, as well as for educational and public information purposes. The Earth Observation highlights include successful photography of the first priority mapping site in Northwestern India, including the snow capped Himalayas. Observation and photography of possible Red Tide occurences at the mouth of the Damascota River, in the Boothbay, Maine, and successful photography of all planned

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desert sites in North Africa, the Arabian peninsula , Australia and Southwestern United States. Next acquisition in 50 seconds through Vanguard. We'll hold the line up for CAP COMM, Bob Crippen.

END OF TAPE

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CC-H Apollo, Houston. We're AOS through the Vanguard and when somebody has a chance to dig out the entry checklist 1-6, we can give you some pads.

CMP Ready to copy.

CC-H Okay. Also, we're ready to go ahead and terminate the charge on battery Bravo if Deke can get to that. And starting with your SBS orbit burn pad: NOUN 33 - 100: 00: 00.00. Would you believe that? Minus 189.2; all balls; plus 017.4. all balls; 180; all balls. 171.9; 00:07, 086.0. Plus 11.1; 25067; minus 0.19; mi-us 078. 33; 054.8; 2.93; 144. Readback please

CMP Okay. Preliminary SPS deorbit burn pad 100: 00: 0000; minus 189.2, plus all - all zips, plus 017.4. All zips; 180; all zips; 171.9; 00:07, 086.0. Plus 11.1; 25067, minus 0.19; minus 078. 33; 054.8; 293; 144.

CC-H That's a good readback, Vance and if you want to go to 17 now, we'll give you your preliminary entry pad.

CMP Okay. We're going to really have a light bird on this entry, aren't we?

CC-H Roger.

CMP Go. Okay. Starting off with the area. It's 138 four balls; right 045; 046. Plus 22.00; minus 163.00. 1637.1; 25752. 26:25, 27:51, minus 0444.7. 307051; 33:42. 27:24, 32:34, 36:27, 37:14. Readback please.

CMP Okay. Readback of preliminary entry pad. 13846, right 045, 046, plus 2200, minus 16300, 16371, 25752, 2625, 2751, minus 04447, 307051, 3342, 2924, 3234, 3627, 3714.

CC-H Okay. A couple of corrections on that. It's not going to make a lot of difference to you but the area is four gauls vice of 4 six. On your - it would be time for BDO it's 2724 vice 2924.

CMP Right. Couldn't read my own writing. Okay. Go ahead with any remarks.

CC-H Okay. Only remark is pitch for rolling entry is 065 degrees.

CMP Copy.

CC-H Okay. Fine. And we're about to go over the hill, we'll see you in 19 minutes at Goldstone. That's at 97:37 and we'll pick up our logic sequencer checks there.

CMP Okay.

PAO Apollo Control. Today's elapsed time 97 hours and 18 minutes. A little less than 3 hours away from the SPS burn, which will deorbit the command module for splashdown near Hawaii at central daylight time of 4:19 p.m. Command module pilot Vance Brand will do the flying of the co - command module for this reentry. Presently the vehicle's in a 200 - 120 by 114 mile orbit. At ground elapsed time of 221 hours and 36 minutes. Next acquisition in 17 minutes and 20 seconds through Goldstone. This is Apollo Control.

END OF TAPE

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PAO Apollo Control. Phase elapsed time 97 hours 35 minutes. 2 hours and 25 minutes yet before the ignition of the SPS engines for retrofire. We will have 43 seconds acquisition through Goldstone. We'll hold the line up for CAPCOM Bob Crippen, as the mission operation control room begins to fill up with other flight controllers.

CC-H Apollo, Houston. We are AOS at Goldstone for 3 minutes. And when we get locked up data, we will be ready for the logic sequencer check.

ACDR Okay. Stand by.

ACDR Let us know to get the data.

CC-H I'm sorry. Say again?

ACDR Are you locked up now, Crip? Are you locked up, Crip?

CC-H We're ready. You can proceed on.

ACDR Okay.

CMP Okay -

ACDR Okay, coming on - next one's sequence logic, 1 and 2, coming ON and UP.

ACDR Okay, the seqs logic are ON and UP.

CC-H Roger. Stand by one.

CC-H Apollo, Houston. That looks good. We're GO for power arm, as required.

ACDR Roger.

CMP Okay.

CC-H Okay, and I kind of led you guys astray, awhile ago, on getting the SIM BAY experiments down. We were supposed to be at deactivating them, and I think we just threw a normal power down. And I've got 2 switches I need to get thrown at - in that panel, to get it squared away.

ACDR Okay. Just a minute, Crip.

CC-H Okay. No rush.

ACDR Okay. Go ahead.

CC-H Okay, Tom. What I need is the experiment cover's arm safe switch placed to SAFE, and the x-ray low voltage turned off.

ACDR Okay. Arm switch is SAFE. X-ray low voltage power OFF.

CC-H Okay. That's a good deal. We're all in the - all squared away now. One item I guess we need for - for entry post-flight photos is - verification that we did get our ZFF taken on time - the last one.

CMP Verification of what?

CC-H That we did get the ZFF photos, our favorite fungi, taken back there at about - oh, 93:50 on the PET Somewhere in that order.

ACDR It was on time.

CC-H Okay, fine. Thank you.

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ACDR As usual, Crip. As usual.
CC-H Oh, roger. Didn't expect any difference. We're
going over the hill. We'll see you at Newfoundland, in about 7 minutes.
ACDR Okay. And I got the pyro battery check at Madrid.
Thank you.
CC-H Roger.
CC-H Apollo, Houston. We're AOS, Newfoundland. And
with the ATS, we should have you about 50 minutes.
ACDR Roger.

END OF TAPE

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SPKR Madrid contact, Houston contact man 1.
SPKR Madrid contact man 1. You're loud and clear. How
me?
SPKR Loud and clear. I didn't hear the downlink.
SPKR Roger.
CC-H Apollo, Houston. Understand you gave me a call a
while ago. It didn't get here. Say again.
ACDR I just wanted to check if we were locked up on ATS.
Over.
CC-H We are locked up on ATS. Sounds like we got our
echo here let - we'll get that squared away.
ACDR Okay.
CC-H Okay. We're all with you. Squared away now.
PAO Apollo Control. Ground elapsed time 222 hours 13
minutes. Flight surgeon Dr. George Armstrong reporting to Flight Director
Frank Littleton the biomed data coming in from the command module looks
very good. He said, in fact, it's very clean, very beautifuly data com-
ing in from the 3 members of the Apollo crew.
ACDR Houston, Apollo.
CC-H Go ahead.
ACDR Okay. We're still kind of getting a snack here
and eating but - I don't know if you want to get that pyro battery check right
on time or wait a couple of minutes. Over.
CC-H Kind of your option whatever you get it out of the
row. We'd just like to hear the results of it. Also, when you finish
it up, we'd like to your - end of your SPS REF check.
ACDR Stand by.

END OF TAPE

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PAO Apollo, Control. 98 hours 1 minute phase elapsed time. Flight director, Frank Littleton receiving a report from recovery - the weather in the recovery area has gone from good to better. Six knot winds at the present time. 58 minutes to the SPS burn.

ACDR Hello, Houston, Apollo.

CC-H Go ahead.

ACDR Okay, the pyro battery check is done. And battery C is on the line.

CC-H Very good.

ACDR Okay Crip, ready to copy our B MAG check.

CC-H That's affirm. Go ahead.

ACDR Okay. NOUN 20; roll 00254; pitch 17534; yaw 35774; thumbwheels 0026,1752,3578 and that was for a period of 42 minutes so it looks like we have a great GDC. Over.

CC-H Very good. And your platform is also stupendous. As they - we've been telling you all through the Mission.

ACDR Roger. We should be able to put her right on the target.

CC-H Roger that.

ACDR Might tell the Skip of the New Orleans that if he'll be there, we'll be there.

CC-H We'll set up the rendezvous.

ACDR Roger.

END OF TAPE

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Time: 13:48 CDT, 222:28 GET

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CMP Houston, Apollo.

CC-H We're looking at it, Vance.

CMP Okay. And if you've got those copied, I'll torque

at 98:11:30.

CC-H Do it.

ACDR Hello, Houston.

CC-H Go ahead.

ACDR Houston, Apollo.

CC-H Go ahead, Apollo.

ACDR Yeah, I was just looking way ahead on this secondary water activation, since it's already boiling and everything; it says secondary coolant loop AC2; we've got it on AC1 now, you want us to switch it over?

CC-H That'll be fine, Tom. You can leave it there. And I guess, one little item here in going through it, we have verified that the electrophoresis cooling valve is in BYPASS. Is that correct?

ACDR I just jumped ahead on it; I'll get back to that.

CC-H Okay. No sweat.

END OF TAPE

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Time: 13:58 CDT, 222:38 GET

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ACDR
(garble).

CC-H

Crip, we'll see you one more time, I guess. Okay,

Okay, fine.

END OF TAPE

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Time: 14:08 CDT, 222:48 GET

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PAO Apollo Control. Ground elapsed time 222 hours 48 minutes. Less than 90 minutes now from burn time for the SPS engine, a burn of 7 seconds which will result in a delta V of 190 feet per second. A report from recovery forces that Orion 1 air craft airborne 18 minutes ago at Greenwich Mean Time 18 hours and 50 minutes.

CC-H Okay, guys. We're about about 2-1/2 minutes from losing you on the ATS here. Everything's looking super good with your GDC and your platform and so forth. If you completed your EMS check, we'd be glad to get that and the only other item that we haven't seen cleaned up is that the LiOH canister change which we didn't see earlier. We haven't seen that effect on our PP CO2.

ACDR Yeah. That was changed on in fact ahead of time.

CC-H Okay Tom.

CMP Tom changed that out.

CC-H Okay. Fine. We had gotten that last one from you Vance, we didn't - didn't think it had been changed yet. That's fine.

CC-H And incidentally, we've picked up a little bit here. We're going to have - have Orroral in about 3 minutes. We've also got a Vanguard pass this time that we'll - we're going to pick up.

PAO Apollo Control. Ground elapsed time 222 hours, 56 minutes. SPS ignition less than 90 minutes away. The final revolution for the Apollo. The SPS ignition will occur at 49 degrees, 09 minutes South by 70 degrees, 31 minutes East and the - in - over the Indian Ocean. Entry interface will occur at 15 degrees, 40 minutes South, 167 degrees, 31 minutes East. The vehicle will enter S-band blackout at 4 minutes, 55 degrees - 4 degrees, 55 minutes North and 177 degrees, 52 - 32 minutes West. Splashdown time still looks nominal at 419 and 52 seconds central daylight time. Approximately 290 nautical miles west of Hawaii.

CC-H Apollo, Houston. We're with you on VHF through Orroral.

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CC-H Apollo, Houston. We're with you on VHF through
Orroral.
DMP Roger.
CC-H Rog. Don't anticipate too good of comm this time
and we'll have you at Vanguard in about 3 minutes.
CMP Houston, Apollo.
CC-H Go ahead, Vance.
CMP EMS checks out good for entry.
CC-H Very good.
CC-H Apollo, Houston. We're AOS through the Vanguard
Have you for 7 minutes on a freebie pass.
ACDR How about that. Say tell the troupes at the Vanguard
thanks alot for all their help and steaming around out there. It's
really great be over.
CC-H They've done a super job. And they're currently
enroute to go over and support the Viking program.
ACDR And the EMS - EMS entry test went good as Vance told
you on a delta V test.
CC-H Roger, that. Thank you.
ACDR And that's in perfect condition.
CC-H Everything's going super. Even down here in the
MOCR. We're squared away. We've got our 2 dozen roses from Cindy
Diane like she's been sending all through the Apollo program so we're
GO.
ACDR Sounds great.
CC-H The weather out there at your recovery point still
super also. It's once more 1800 scattered, 10 miles vis. Winds out
of the east about 15 knots with wave heights 4 feet, may be even
less. Looks like they're declining a little bit. Should have a super
landing.
ACDR Thank you.
CC-H And, a little reminder, of course you know the New
Orleans is the recovery ship. Your two helos out there will be Recovery
and Swim.
ACDR Recovery and Swim. Roger.
ACDR And we reverified that the 6 -165 electrophoresis
cooling valve is in bypass.
CC-H Okay. Make our cap EECOM dorim here comm feel much
more comfortable.
CMP Houston, Apollo.
CC-H Go ahead Vance.
CMP Our alignment checks out good and no RCS -
CMRCS preheat required.
CC-H Very good.
CC-H Apollo, Houston. We're a little over a minute
from LOS at Vanguard and our next station contact will be Goldstone in
19 minutes. That's at 99:09. Your prelemenary pads are GO. We will
not have a pad update for you there. The only thing we'll be needing
is ACCEPT when we become AOS and we'll give you state vector update.

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CMP Okay. Understand - understand the preliminary pad.
CC-H That's affirm. They're GO.
PAO Apollo Control. Ground elapsed time 223 hours 9
minutes with less than 1 hour and 9 minutes to go for the burn of the SPS
engine. This will bring back the command module. Splashdown in
the Pacific, northwest of Hawaii. This will be a burn of 7 seconds
in duration. The command module will be oriented minus 8 degrees,
pitch down. The crew of Apollo will be heads down on this burn. The
primary recovery helicopter flying off the New Orleans will be commanded
by Commander Alfred E. Pellelan(?) of Chilavista, California. The copilot
is Lt. Jr. Grade John J. Thompson of Chilavista, California and the
crew of Chief Petty Officer, Vernon A. Bender(?) of San Diego, California,
and Petty Officer, 3rd class, Robert J. Correll(?) of Phoenix, Arizona.
The swimmers aboard the primary helicopter are Lt. Thomas Clihammer(?)
of Detroit, Michigan, Sr. Chief Petty Officer, Ted A. Casa(?) of Spokane,
Washington, Petty Officer 2nd class, Kurt R. Trailer, Med - Medford,
Oregon, Petty Officer 3rd class, Kenneth A. Roper, Forest Ranch,
California. 1 hour and 7 minutes to go for the Apollo deorbit maneuver
which will occur high over the Indian Ocean at latitude 49 degrees
09 minutes south and 70 degrees 31 minutes east. Next acquisition
in 16 minutes and 54 seconds will be Goldstone at ground elapsed
time of 223 hours 11 minutes. This is Apollo Control.

END OF TAPE

ASTP (USA) MC713/1
Time: 14:43 CDT, 223:22 GET
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PAO Apollo Control; ground elapsed time 223 hours and 23 minutes; 55 minutes away from the burn of the SPS engine. As Flight Director Frank Littleton here polls his flight controllers; as we have access with Goldstone in less than 4 minutes for the final stateside pass of the final orbit of Apollo. As we receive ATS acquisition following this Goldstone pass, the first thing the flight controllers will be looking for is the activation of the RCS system aboard the command module. The viewing room here at the Mission Control Center beginning to fill up with NASA dignitaries: Dr. James Fletcher, NASA administrator, Captain Lee Schear, Director of the Kennedy Space Center, Dr. William Lucas, Director of the Marshall Spaceflight Center, and Walter Caprian, Launch Director for the Kennedy Space Center. Here on the floor of the Mission Operations Control Room is Dr. Christopher C. Craft, Director of the Johnson Space Center; Glynn Lunney, Technical Director for the ASTP Program; and Chet Lee, Director of the ASTP program for NASA Headquarters. Adding a little color to the room today, is veteran Flight Director Gene Kranz in his red, white and blue Centennial vest. Acquisition in 3 minutes for Goldstone; we'll bring the line up for Cap comm Bob Crippen, Flight Director Frank Littleton.

CC-H Apollo, Houston. We're AOS Goldstone - 4 minutes.

CMP Roger, Crip. Coming right up over the San Juaquene(?) Valley. Loud and clear.

CC-H Roger. Beautiful place. Okay, if we could go ahead and have ACCEPT, we'll send you a state vector.

ACDR You've got ACCEPT, Crip.

CC-H Apollo, Houston. Our state vector load is complete; you can go back to BLOCK. We're about a minute and 1/2 from LOS. And we'll have you again in Newfoundland in 7 and 1/2 minutes.

CMP Okay. Do you want to activate the RCS over Newfoundland or ATS?

CC-H Oh, if you can hold up till we get ATS; we've got data on there - we don't have data through Newfoundland - we'd appreciate it.

ACDR Okay.

END OF TAPE

ASTP (USA) MC714/1
Time: 14:52 CDT, 223:32 GET
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PAO Apollo Control, ground elapsed time 223 hours, 32 minutes, 46 minutes away from the Apollo deorbit maneuver. As Apollo crosses the northern United States, the flight controller reporting to flight director Frank Littleton, everything looks good aboard Apollo. The electrical environmental officer telling the flight director all looks good. The flight surgeon reporting good data from all 3 crew members, who have donned the biomedical harness for this reentry. We will have acquisition through the ATS-6 satellite in approximately 4 minutes, as the final Apollo nears the end of its mission. Total of - accumulated today, will bring U.S. astronauts manned accumulative total space to 22,468 hours, 43 separate astronauts flying in the missions, 6 mercury and Gemini, 11 Apollo, 3 in Skylab and final ASTP mission. All told, a total of 3,422 revolution made around the Earth by U.S. manned spacecraft. Today also the day that Apollo 11 splashed down in the Pacific Ocean following the first lunar flight in July 1969. The 3 Apollo crewmembers will experience the maximum g's of 3.7 during the reentry. Maximum total heating on the command module, will be 54 BTU's foot per second, or total heat load of about 16,104 BTU's. This will be the final manned mission from the MOCR in the second floor. This operation here, the second floor MOCR has conducted flights of the Apollo 7, Apollo 9, and all 3 Skylab missions. Acquisition in 2 minutes through the ATS-6 satellite. We'll hold the line up for CAP COMM, Bob Crippen.

CC-H Apollo, Houston. We're talking at you through the ATS and we'll have you until you turn it off.

ACDR Sounds good, Crip. How do you read?

CC-H Loud and clear.

ACDR All right.

ACDR Okay, we're getting strapped in.

CC-H Okay, Tom. Whenever you all get all squared away, we're - got good data here, and you can go ahead and proceed on with the CMR CS activation.

ACDR Roger. We'll activate the CMR CS.

ACDR SECS logic on and UP.

CC-H And, we're GO for PYRD ARM.

ACDR Roger. GO PYRO ARM.

ACDR Okay, 3, 2, 1. MARK it. Got a nice bind(?).

And both rings are stabilized. You're probably reading it out. Number 1 looks like about 36 plus going back up. And number 2 is stabilized at 36.

CC-H Okay, I'll look through the (garble) Tom.

CC-H Apollo, Houston. We've got alittle tracking data that will allow us to get your state vector in better shape than we did at Goldstone. So if we could have ACCEPT before you go into P30, we'll go ahead and update that one or tweak it.

CMP You've got it.

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CC-H Apollo, Houston. Our state vector base complete.
You may go back to BLOCK.

ACDR Roger. Go on back to BLOCK.

ACDR Okay, Crip. If you're ready, we might as well go ahead and get a couple minutes ahead of the game. Want to pick up on the checklist at 99 plus 30. We'll cycle CMC mode switch free and AUTO and do the - recheck the VERB 48.

CC-H Press on.

PAO Apollo Control. 99 hours 29 minutes phase elapsed time. 31 minutes from - 20 minutes, now, from firing of the SPS engine. Flight director Frank Littleton pulsing his flight controllers. EECOM reports everything looks fine. The FIDO office says everything looks good. The computer load is correct.

PAO Flight surgeon Dr. John Ziegelschmidt(?) reporting to flight director that all data looks good from the three crewmen. Everyone looking great aboard Apollo at this time.

ACDR Houston, Apollo. We have Anteres in the sextant.

CC-H Copy that. Good star check, thank you.

PAO Tom Stafford reporting the - he lined Anteries, the star, for the final navigation for the re-entry. The guidance office reporting the platform looked straight for re-entry.

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Time: 15:11 CDT, 223:51 GET
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PAO EECOM officer reporting that the reentry batterys' are all charged up for a total of 113 amp hours, 3 silver oxide batteries aboard to handle the power for reentry.

ACDR Okay, Crip. Looks like everything's all completed. We're going to SDS bank entry cue card now. Over.

CC-H Roger. Sounds good.

ACDR Hello, Houston, Apollo.

CC-H Roger. Go ahead.

ACDR Okay, Crip. Everything's up - in great shape up here. The only thing we're concerned about is that you've got all your splashdown parties coordinated, over.

CC-H Well, I've been working on that. I'm not sure we got it all straightened out, but we're doing our best.

ACDR Okay. I'm sure it's going to be a task.

CC-H Well, flight claims his do got us straighten out so maybe we can square me away as soon as we get you burned.

ACDR Okay. Sounds good. (Laughter.)

CC-H Everything's looking spiffy here. It's all in good shape. The fact is it's - it's so calm without - we feeled under-worked.

ACDR (Garble) long hours.

DMP (Garble).

CC-H Rog.

DMP Would you have your comm and electrical expert explain to me why (garble) reads 31 and a half volts.

CC-H EECOM comm will take a look at it.

ACDR Okay. I got one that's 31 and a half and one that's 36 and a half and that doesn't seem quite normal.

CC-H Okay. This is Bravo you're reading us 31 and a half, is that correct?

ACDR That's right - I'm sorry it's Alpha that's 31 and a half, Bravo's 36 and a half.

CC-H Okay. Copy that.

CC-H Deke, the reason for that is that Alpha's had about 5 amphere - hours out of it and we just finished it charging up Bravo so that's the reason it's higher.

DMP Okay, fine. Thank you. You sure there's some logical reason?

CC-H Well, at least you gave EECOM something to look at.

DMP I hope I didn't tear him away from his coffee.

CC-H We managed to keep one hand on it at all times.

DMP All are of Ed's antennas under control?

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CC-H Well, at least you gave EECOM here something
to look at.
CMP (GARBLE)
CC-H How you managed to keep one hand on it at all times.
CMP Are all Ed's antennas under control?
CC-H Promise they're in good shape. We got - we got Ed
sitting in the back seat right now.
CMP He's just going to watch this one huh?
CC-H Rog.
PAO The plotboard here at the control center changing
to an amber color. The amber team directed by flight director Frank
Littleton. 10 minutes to the burn.
CMP Crip, you've had a lot of practice on these entries,
haven't you?
CC-H Well, we're - we're getting a little bit but I'm
afraid not nearly as much as you have.
CC-H The only reason for that is, Vance, we've - because
I like to smoke the cigars.
CMP That's the way.
PAO An added visitor to the viewing room here at mission
control center, Dr. Robert Gilruth, former director of the Johnson
Space Center.
CMP (Garble) gimble.
CC-H Roger.
PAO Less than 4 minutes to the burn. Flight Director,
Frank Littleton getting a good - -
CC-H Apollo, Houston. We're all GO here for your
deorbit burn.
CMP Okay, Crip. Very good. So are we.
PAO Less than one minute to the burn. A 7 second burn
of the SPS engine.
PAO The burn went off on time according to FIDO.

END OF TAPE

ASTP (USA) MCT18/1

Time: 15:41 CDT, 224:21 PET

7/24/75

PAO The burn went off on time according to FIDO.
CC-H Copied that.
ACDR Looks like a real nice little perigee.
CC-H Roger.
ACDR Minus 18:40 MS.
CC-H Roger.
CC-H Is that 18:04 Tom?
PAO Good burn and good trim entry interface 20 minutes,
and 14 seconds after retrofire.
SKPR Entry interface will come over the Bank Islands in
New Hebridies.
ACDR Okay, Crip we're Go for your shutdown on the ATS. Over.
CC-H And you're Go to go ahead and do that, and we'll have
you in about 7 minutes at ARIA - correction, Orroral.
ACDR Sounds good. (together) See you later.
PAO Apollo Control, 5 minutes, and 23 seconds since the
burn. The entry interface will occur at 16:03 central daylight time.
The crew will begin blackout at 16:05, and end blackout at 16:10 Greenwich
mean time.
PAO The command module inter S-band blackout at 4 - 4
degrees 55 minutes north, and 177 degrees 32 minutes west over the
Guilbed Isands.
PAO Next acquisition will be Orroral Valley where the
flight director Frank Littleton will look through his flight controllers
to get confirmation of proper reentry. Splashdown 290 miles west of
Hawaii, as the NEW ORLEANS and her recovery crew awaits the landing of
the Apollo. - Primary recovery helicopter under the command of Commander
Alfred E. Pellerin will be the first on the scene. And Lieutenant Thomas
Kleehammer, and petty officer, - Chief Petty Officer Ted A. Kassa of
Spokane, Washington will be the first two swimmers in the water. They
will attach a sea anchor to the command module. Second two swimmers
from the recovery helicopter will assist in applying the flotation
collar, around the command module. Indications here that the burn went
well. Good confirmation through Orroral, in 3 minutes. - -
The landing footprint is 970 miles in length and approximately 176
miles in width. - Spacecraft reach is 24,000 feet. Drogue shoots will
deploy. Drogue shoots will slow the spacecraft down from the approximately
300 miles per hour to 170 miles per hour. At about 10,000 feet, three
pilot shoots will draw the main shoots to slow the spacecraft down from
170 miles - 170 miles - 175 miles per hour to 22 miles per hour the impact
velocity at splashdown. - Word here at Mission Control is the Russian
Control Center in Moscow up and listening watching with - wishing good
luck to the crew here at Mission Control Center, and the crew of Apollo.
10 minutes away from entry interface. -
CC-H Apollo, Houston. We're AOS through Orroral, on
VHF.

END OF TAPE

ASTP (USA) MC719/1
Time: 15:53 CDT, 224:33 GET
7/24/75

CC-H Apollo, Houston. We're AOS Orroral. We have you for a couple of minutes.

PAO EECOM confirms separation of the command service module. Service module will land approximately five minutes after splashdown of Apollo.

CC-H And Apollo, be advised that we have nega - no pad update for you.

DMP How do you read us, Crip?

CC-H Loud and clear. How me?

DMP Okay. You guys got data down there now?

CC-H That's affirm. We've got a few minutes coming across Orroral here.

DMP Okay. How about telling them to take a look at our pyro batteries. I'm showing an amp ascillation. About a minus 2 to plus 2. I don't think it's anything but - I never noticed it before so they might want to take a look at them.

CC-H We'll take a look.

CC-H Tom, correction, Deke, would you clarify that you're talking about your pyro buff amp.

DMP That's affirm. Pyro. They should nominally be reading zero.

CC-H Roger.

DMP They're just oscillating there and I'm assuming that's the instrumentation thing but -

CC-H That's affirmative. They're all safe, there's no problem with them at all.

DMP Okay.

CC-H Okay, we're about to go over the hill here at Orroral and we should have you after blackout through ARIA.

DMP Roger.

PAO Apollo control, 16 minutes and 14 seconds since the firing of the SPS engine. A little less than 4 minutes away from entry interface 400,000 feet as the spacecraft crosses over the Newheperities Islands with impact still predicted at central time 4:19 and 52 seconds. Flight controllers reporting to flight director Frank Littleton. All looks good aboard the spacecraft. Deke Slayton questioning amperes in the pyro batteries, however, EECOM reports no problem in this area. Next acquisition will be through the ARIA aircraft.

PAO On the IDA4 here at mission control center a photograph - a simulated photograph of a recovery man painting a cross on the water drew a big laugh from the flight controllers and flight directors here at mission control center.

PAO Entry interface less than 11 seconds away.

END OF TAPE

ASTP (USA) MC720/1
Time: 16:00 CDT, 224:40 GET
7/24/75

PAO 6 minutes away from drogue shutes deployment, slowing the spacecraft from 300 miles per hour to 175 miles per hour.

PAO Report from the New Orleans. Five helicopters in the air for recovery. Target point 285 miles northwest of Hawaii.

PAO Word from New Orleans. Radar contact by the New Orleans.

PAO Radar contact 216 miles from the New Orleans.

PAO Should have end of blackout.

CC-H Apollo, Houston. Talking at you through ARIA.

USA (Garble)

CC-H I could hear you. That was it.

ACDR The computer scared (garble), Crip.

CC-H Rog, Tom. You're - you're breaking up in (garble) at this time.

ACDR (Garble), Crip.

PAO Drogue chute deploy in 1 minute.

ACDR (Garble) the light out.

PAO Radar now shows 56 miles to the command module.

PAO Recovery reports right down the track for the command module.

ACDR Okay. Altimeter's coming off the bank.

CC-H Roger.

ACDR (Garble) VERB.

CC-H I'll do that.

ACDR (Garble) seven tenths. This baby is right on. 45 K.

CC-H Okay. It's all looking good here. We got data and we got - got you in radar contact at the ship.

PAO Flight surgeon reporting good data from all three crew members.

CC-H Okay, Apollo. You're looking super here. You're coming up on your main time and - on drogue time rather and - so, see you tomorrow or the day after tomorrow.

PAO - - see it from the ship.

CC-H They've got you on TV.

PAO Apollo coming in close to the command - recovery ship.

ACDR (Garble)

PAO Drogues visible from the New Orleans. Round of applause here at Mission Control Center.

ARIA And my position, as you know, is 0253 degrees. (Garble) New Orleans is 169 degrees radio 7.5 nautical miles.

SPKR (Garble) roger, out.

ELS Apollo recovery, over.

ELS Apollo, this is recovery. Broadcasting in a blind (garble) voice secondary.

ASTP (USA) MC720/2
Time: 16:00 CDT, 224:40 GET
7/24/75

PAO - - no word from recovery forces with the crew.
SPKR (Garble)
ELS Apollo, this is Recovery broadcasting in the blind. No
reception on Alpha voice secondary but we have you in sight visually
(garble) at this time.
USA Roger.
HELO-1 (Garble) recovery is (garble) 025 degrees. I am on New
Orleans 150 degrees radial, 5.5 nautical miles.
NEW New Orleans, Roger. Out. We have a good picture, over.
ELS (Garble). Recovery, roger.
SPKR (Garble 02013.
NEW New Orleans, Roger, Out.
SPKR (Garble) on the command module?
SPKR Okay. (Garble) 600.
SPKR Contact.
CC-H A tremendous round of applause here at Mission Control
Center with splashdown.
ELS Report splashdown at this time. Apollo is on the water.
NEW New Orleans, roger, out. Stable 1 and stable 2.
ELS Roger. That was (garble). We'll give you a MARK
on (garble).
NEW Roger.
PHOTO New Orleans, Photo. We got a stable 2. Stable 2 she's
(garble).
PAO Stable 2 condition. The vehicle upside down. Inflation
bags will right to the vehicle.
PHOTO Roger.
ELS Okay, Photo. You got me in sight?
PHOTO (Garble)
ELS Okay. Take you position, Photo. I'll get a MARK on
(garble).
PHOTO Roger.
ELS Okay. Recovery stand by for a MARK 1 (garble).
SPKR (Garble).
ELS I've got you confirmed there stable 2. I'm going to
drop now (garble). 089 radio at 5.2 nautical miles.
NEW (Garble) radio?
ELS (Garble)
NEW (Garble) radio (garble).
SPKR (Garble) half a mile.
ELS Roger. You're (garble) deploy your swimmers.
SPKR Yes. Let's hook them.
SPKR All in all Apollo is (garble). We're getting some dye
marker in the water. They've got the (garble) (garble) and is (garble) of
the command module. They have a righting bag in place at this time.

END OF TAPE

ASTP (USA) MC721/1
Time: 16:21 CDT, 225:01 GET
7/24/75

HELO - -of the command module. We have a (garble) and
inflation at this time.
PAO Reinflation bags, 22 cubic feet each, will be
inflated to right the vehicle.
HELO Recovery ELS, I'd like to take that down (garble).
ELS Recovery, ELS, you're clear again (garble).
ELS Deploy your swimmers on (garble).
NEW (Garble) negative. I say again negative on the hatch.
NEW Recovery, this is New Orleans, over.
ELS This is Recovery, New Orleans, go ahead.
NEW I heard negative, I say again negative on the hatch,
over.
ELS (Garble)
ELS New Orleans, this is Recovery. The bags are inflating
at this time. The module (garble) is just about to come to stable 1.
NEW New Orleans, Roger. Out.
ELS (Garble)
ELS New Orleans, this is Recovery. We can see two righting
bags inflated at this time.
NEW New Orleans, Roger, out.
PHOTO New Orleans, Photo. We got a second ELS swimmers
in the water. They have the chutes (garble)
NEW New Orleans, Roger, out.
ELS Swim, Recovery, your position?
SWIM I swam a half mile.
ELS Apollo is in the water. (Garble)
HELO (Garble)
ELS This is Recovery. New Orleans, we have a stable 1 at - -
HELO (Garble)
NEW New Orleans, Roger, out.
HELO (Garble)
PAO 5 minutes after splash. The spacecraft right at apex 1
condition.
HELO (Garble)
CMP Okay, Recovery. How do you read?
SWIM Okay, Vance?
CMP Yeah, I'm fine.
DMP SECS ARM, SAFE. SECS LOGIC, OFF. Circuit breaker
post LANDING VENT CLOSE. Circuit breakers FLOAT BAG, 3, CLOSE. (Garble)
CMP Now wait a minute, Deke. That's the (garble). What
was the last (garble)?
DMP Okay, circuit breakers POST LANDING VERT, CLOSE.
SWIM (Garble)
HELO (Garble)
DMP Thank you.
ELS (Garble) the first ELS swim team has (garble) the
second ELS swim team has chutes in the water and (garble)

ASTP (USA) MC721/2

Time: 16:21 CDT, 225:01 GET

7/24/75

SWIM (Garble)
NEW ELS, Roger.
ELS Apollo, this is Recovery. How do you read? Over?
USA (Garble) stable 2 (garble)
ELS Apollo, ELS, signing over.
USA Okay, (garble) upright. We're stable now. We're
okay now. We're stable 1. Okay.
USA (Garble)
USA (Garble)
USA (Garble)
USA Okay, we'll (garble)
PHOTO Photo, we have a few shroud lines still attached to
the command module from one chute. All three ELS (garble) in the water
and the chute recovery is proceeding normally.
NEW New Orleans. Roger, out.
ELS Apollo, six swimmers in the water. All swimmers are okay.
NEW New Orleans, Roger, out.
SWIM How do you feel, okay?
ACDR I think (garble)
SWIM (Garble)
ELS The first swimmers (garble) Recovery, 6 to 10 yards
(garble) command module (garble). They're okay.
ACDR Recovery how do you read me?
NEW New Orleans, Roger. Out.
NEW Thank you. Your picture looks good. Over.
ELS Apollo, this is Recovery. If you read, check the
(garble) light.
USA (Garble)
PHOTO New Orleans, Photo, we've got the sea anchor attached
to the command module.
NEW New Orleans, Roger, out.
USA (Garble)
PHOTO New Orleans, Photo. We've got (garble) VHF antennas
and a flash and a light that is (garble). And the swimmers are deploying
the sea anchor at this time. We got the six ELS swimmers pulling the
chutes in the raft. All swimmers are okay. There are light swimmers in
the water.
NEW Roger, understand we're gonna recover all three
rafts. Over.
USA (Garble)
PAO Command module two miles from the New Orleans at
this time.
ACDR Okay. Circuit breaker FLIGHT and POSTLANDING
BAT C - BAT C. Curcuit breaker PYRO A SEQUENCE A, OPEN and PYRO B
SEQUENCE B, OPEN.
CMP Okay.

ASTP (USA) MC721/3
Time: 16:21 CDT, 225:01 GET
7/24/75

ACDR (Garble) pyro B. (garble)
USA (Garble)
NEW Roger.
USA (Garble)
ELS Apollo, (garble) deployed at this time and the
flotation collar is (garble) and the second swimmers from Recovery are
in the water with the flotation collar and they're okay. (garble)
NEW New Orleans, Roger, out.
USA (Garble)
CMP (Garble) BAT BUS B, B voltage greater than 27.
USA (Garble)
CMP (Garble) BAT BUS A, B (garble)
CMP Unstow and install the PLV distributing duct.
DMP And there's three of them.
USA There should be three.
CMP Yeah.
DMP I see one here.
CMP Okay, get three of them.
DMP Over here.
ACDR (Garble)
DMP Yeah.
CMP (Garble), huh?
ACDR Yeah.
CMP (Garble)
DMP Yeah. Well I tried to call but nobody's answered.
CMP Okay.
USA (Garble)
PHOTO (Garble) Photo, we're getting a bungee around the
command module at this time.
NEW New Orleans, Roger, out.
USA (Garble)
USA (Garble) just about the time that the hooks came out.
ACDR Why the hell don't they come and fix it?
USA (Garble)
USA (Garble)
PHOTO There's flotation collar deployed around the command
module at this time.
ACDR (Garble)
CMP Yeah.
ACDR (Garble)
CMP (Garble)
ACDR (Garble)
CMP I don't know (garble)
PHOTO Apollo, Photo. We've got the flotation collar
deployed.
CMP Hey, that's (garble)