

D18-5000149

JSC-09815

# ASTP TECHNICAL AIR-TO-GROUND VOICE TRANSCRIPTION

PREPARED BY  
TEST DIVISION  
PROGRAM OPERATIONS OFFICE



*National Aeronautics and Space Administration*  
**LYNDON B. JOHNSON SPACE CENTER**  
*Houston, Texas*

JULY 1975

## INTRODUCTION

This document is the transcription of the technical air-to-ground (TAG) voice communications of the Apollo-Soyuz Test Project (ASTP) mission. The transcript is divided into three columns — time, speaker, and text. The time column consists of three two-digit numbers for hours, minutes, and seconds (e.g., 22 45 12). All times are expressed in Greenwich mean time (GMT) for the Julian dates shown at the alternate left- and right-hand corner of the page. The speaker column indicates the source of a transmission; the text column contains the verbatim transcript of the communications.

A series of three dots (...) is used to designate those portions of the text that could not be transcribed because of garbling. One dash (-) is used to indicate a speaker's pause or a self-interruption and subsequent completion of a thought. Two dashes (- -) are used to indicate an interruption by another speaker or the point at which a recording was abruptly terminated. Words given unusual emphasis by the speaker are underlined. Three asterisks (\*\*\*) are used when clipping, static, or other electronic distortion obliterates the voice. Material enclosed within parentheses has been translated from Russian.

The ASTP mission began with the lift-off of command-service module 111 at 19:50:00.68 GMT (14:50:00.68 c.d.t.) on July 15, 1975. The crew splashed down in the Pacific Ocean at 21:18:27 GMT (14:18:27 c.d.t.) on July 24, 1975.

Speakers in the transcript may be identified as follows.

### Spacecraft:

ACDR	USA Commander (Thomas P. (Tom) Stafford)
CMP	USA Command Module Pilot (Vance D. Brand)
DMP	USA Docking Module Pilot (Donald K. (Deke) Slayton)
USA	USA unidentified spacecraft speaker

SCDR	USSR Commander (Alexey Leonov)
SFE	USSR Flight Engineer (Valeriy Kubasov)
USSR	USSR unidentified spacecraft speaker

MS	Multiple speakers
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Mission Control Centers:

CC-H USA CAP COMM (H = Houston)  
CC-M USSR CAP COMM (M = Moscow)  
LCC Launch Control Center  
MCC-H USA Mission Control speaker other than CAP COMM  
MCC-M USSR Mission Control speaker other than CAP COMM  
PRESS News media representative in building 2 auditorium

Other:

AA Unidentified station  
CT-(STA) Comm tech (plus tracking station designation)  
ELS Earth landing system helicopter  
NEW USS New Orleans  
PHOTO Photographic helicopter  
REC Recovery helicopter  
SWIM Swim team helicopter

Suffixal designations (during transfer phases only)

-CM Speaker in command module  
-DM Speaker in docking module  
-OM Speaker in orbital module  
-DV Speaker in descent vehicle

Transcription of these tapes was managed by Billie E. Johnson, Test Division, Program Operations Office, to whom inquiries regarding this document should be referred.

Day 196

TAG Tape 196-02/T-1  
Time: 196:18:45 to 196:20:15  
Page 1

ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

19 50 01 ACDR And we have a lift-off.

19 50 04 ACDR And the clock is started.

19 50 06 ACDR And program 11. (Okay.)

19 50 10 ACDR Roger. Tower clear.

CC-H Roger, Tom. You got good thrust on all engines.  
You're right on the money.

19 50 15 ACDR Roger. I got a roll program started, but not much.

CC-H Roger, Tom.

19 50 21 ACDR There she goes. Pitch program; a little shaky lift-  
off, but it's smooth as silk now, Dick.

CC-H Okay.

19 50 37 ACDR 30 seconds and we're on the way.

CC-H Roger, Tom. You're looking real fine.

19 50 50 ACDR 2 g's.

CC-H Roger.

CC-H Stand by for Mode I Bravo.

19 51 01 CC-H MARK. I Bravo.

ACDR Roger. I Bravo, 2 g's.

CC-H Roger.

CMP And cabin pressure's coming down.

CC-H Roger.

19 51 20 CC-H Apollo, Houston. You're feet wet and on your way.

ACDR Roger. Feet wet.

ACDR Man, it's the ... I ever flew.

CC-H Roger.

19 51 42 ACDR EDS AUTO, OFF; 2 ENGINE OUT, OFF; LV RATES, OFF.

19 51 46 CMP We've got an SM RCS A light on.

CC-H Roger.

19 51 53 CC-H Apollo, Houston. You're Mode I Charlie.

ACDR Roger. I Charlie, Dick.

CC-H That's affirm.

19 52 00 ACDR 3-1/2 g's.

19 52 04 CC-H Apollo, Houston; you're GO for staging.

ACDR Roger. GO for staging. 4 g's.

19 52 17 ACDR Inboard.

19 52 20 ACDR Outboards.

19 52 22 ACDR Staging.

CC-H Roger, Tom.

19 52 26 ACDR Okay, and that light is out on the IVB.

CC-H Roger.

19 52 32 ACDR We got acceleration.

CC-H Roger.

19 52 36 CC-H Apollo, Houston. We've had a PU - PU shift, and thrust is up on S-IVB. Looking real fine; right on the money.

ACDR Roger, Dick.

ACDR 48, 49, 50 - jett it.

19 52 52 ACDR Tower jett. There she goes!

Day 196

CC-H Roger. Tower jettison - -  
ACDR Adios.  
19 52 54 CC-H - - and you're Mode II.  
ACDR Roger. Mode II.  
19 53 00 CMP Okay, and we got the steam running with the water.  
19 53 03 ACDR Guidance is initiated.  
CC-H Roger. Concur.  
19 53 38 ACDR At 3:30; onboard trajectory looks good, Dick.  
CC-H Roger, Tom. Concur; you're looking real good.  
ACDR Roger.  
CC-H And, Tom, be advised we have been dropping out CMC data a little bit here on the ground, but the CMC is GO; you're doing fine.  
ACDR I understand.  
19 54 02 CMP Incidentally, Dick, we don't have that caution and warning on SM RCS A any more.  
CC-H Roger, Vance. I copied that. Thank you.  
19 54 23 CC-H Apollo, Houston. Coming up on 4-1/2 minutes, you're GO. And, Vance, we think that that was a package temp that was low. It's coming up within tolerance now, and you're looking fine.  
CMP Okay, fine.  
19 54 33 ACDR At 4:30, back to one-g acceleration and looking good, Dick.  
CC-H Roger.  
19 55 00 CC-H Apollo, Houston. At 5 minutes, you're GO.  
ACDR Roger. 5 minutes. Looks good onboard, Dick. And we've got a beautiful sight.

CC-H Roger. Wish I could see it.

ACDR Roger.

DMP Man, I tell you, this is worth waiting 16 years for.

CMP Got a beautiful ocean out - -

CC-H I believe - -

CMP - - here, Dick.

CC-H Roger. I believe all of that.

19 55 37 ACDR Okay, at 5:30, onboard trajectory looks beautiful.

CC-H Roger. Concur, Tom. You're right on the money.

19 56 00 CC-H Apollo, Houston. You're right on at 6 minutes; you're GO.

ACDR Roger.

19 56 18 DMP Okay. You've got OMNI Charlie.

CC-H Okay, Deke. Thank you.

19 56 59 CC-H Apollo, Houston. At 7 minutes, you're GO; and we're standing by to watch the gimbal motors.

ACDR Roger. Starting the gimbal motors. PITCH 1 on -

19 57 05 ACDR MARK it. That's a good one. YAW 1 on -

19 57 07 ACDR MARK it. That's good. PITCH 2 on -

19 57 10 ACDR MARK. YAW 2 on -

19 57 12 ACDR MARK. Both good.

19 57 22 CC-H Apollo, Houston. You've got four good gimbal motors, and the trims are great.

ACDR Okay, real fine. Thank you, Houston.

CC-H Roger.

Day 196

19 57 50 ACDR That felt like a PU shift, Houston.

19 57 54 DMP At exactly 7:49.

CC-H Roger, Tom.

19 58 00 CC-H And, Apollo, Houston. You're GO at 8 minutes; and you're right, that was PU shift, and the thrust is GO. You're right on.

ACDR Roger. Everything looks good onboard. ...

ACDR ... Trajectory looks good onboard.

CC-H Roger. Concur, Tom. You're GO.

19 59 01 ACDR 9 minutes. Apollo's GO.

CC-H Roger. At 9 min - at 9 minutes, you're GO.

ACDR Roger.

CC-H And, Apollo, Houston. We're predicting a guided cutoff at 9 plus 46.

ACDR Roger. 9 plus 46.

CC-H Stand by for Mode III Alfa.

ACDR Roger.

19 59 28 CC-H MARK. Mode III Alfa.

ACDR Roger. III Alfa.

CC-H Stand by for Mode IV capability.

ACDR Roger.

19 59 43 CC-H MARK. Mode IV capability.

ACDR Roger.

19 59 46 ACDR SECO.

CC-H Roger.

ACDR And we were right in there.



CMP We're there.

DMP We is here.

19 59 55 CMP Okay.  $V_I$ , 25649; H-dot, minus 4; altitude, 83.2.

CC-H Okay, Vance. Thank you.

CMP ... according to the computer in an 89.4 by 83.1.

CC-H Okay. Thanks, Vance. We'll check it ourself.

CMP (We are now in orbit.)

20 00 48 CC-H Apollo, Houston. The range safety system has been safed, and you're in a GO orbit.

ACDR Roger. And it does look beautiful up here.

CC-H Apollo, Houston. In about 30 seconds we're going to have LOS from Bermuda, so we'll lose our S-band, but we'll keep you on VHF at Newfoundland.

ACDR Roger.

CMP Okay.

DMP Okay. And, Houston, could you doublecheck bat ... I'm not sure it untied. I'm still showing some amperage on it.

CC-H I'm sorry, Deke. You're going to have to say again, please.

20 01 26 DMP Yeah, bat bus ... When I came off the bat bus tie, I'm still showing some amperage. Could you guys confirm that it's in fact off?

CC-H Roger, Deke. You're okay. That's amperage from the EDS and when the - down at the bottom of the list, when you get the FUEL CELL REACTANTS VALVE to NORMAL, that'll go away.

DMP Thank you.

20 01 54 CC-H No problem.

Day 196

20 02 34 CC-H And, Apollo, Houston. How do you read me on VHF through Newfoundland?

ACDR 5 by 5, Dick.

CC-H Okay. We've got you for about another 3-1/2 minutes.

20 05 06 CC-H Apollo, Houston. We're about 1 minute from LOS at Newfoundland. We're going to drop out, and I'll give you a call about 3 minutes from now for a short pass through Madrid. See you there.

DMP Okay, Dick.

CMP Thank you. We're just getting helmets and gloves off here.

CC-H Okay. We've gone around the room and looked at all the data we had during the launch phase, and you're looking real fine. No problems.

20 05 27 ACDR Super.

20 11 08 CC-H Apollo, Houston through Madrid. How do you read?

ACDR Loud and clear, Dick.

CC-H Roger. Read you the same. This is a short pass. We're not sure exactly how long it's going to last, but it will be about a minute. And ARIA is going to come up at about 55 minutes, so we'll see you there.

20 11 25 ACDR Okay.

END OF TAPE

Day 196

ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

20 44 14 CC-H Apollo, Houston through ARIA. How do you read?  
ACDR Roger; through ARIA. We're ... on page 15 of -  
page 3-7 of the checklist ... maneuver.  
CC-H Roger, Tom. The comm is pretty bad. Just tell me  
again what page on the checklist you are.  
ACDR 3-7.  
CC-H Okay. And we'll be standing by.

20 44 36 ACDR Gee, we haven't completed parts of 3-4, 5, or 6 yet  
either, Dick.  
CC-H Okay.

20 50 24 CC-H Apollo, Houston. We're 1 minute from LOS ARIA.  
I'll give you a call at the Vanguard at an hour  
and 12 minutes.

20 50 30 ACDR Roger. Okay, Dick.

21 02 01 CC H Apollo, Houston. Vanguard for 6 minutes.  
ACDR Okay. We're in - in attitude - going to be doing  
the TD&E in 2 minutes, Dick. We're set up at  
58:08 and counting.  
CC-H Okay, Tom. Super. And, Deke, a reminder on the TV  
camera. We don't have any way of monitoring it on  
the VTR, so when you get turned around and get a  
monitor picture, you might select the f-stop, as  
required, and also PEAK instead of AVERAGE, if that's  
required.

21 02 30 DMP Okay. We're sitting here looking at the monitor now,  
but of course I don't see much in it. We'll keep  
an eye on it.  
CC-H Roger. Understand.

21 04 08 ACDR We're off the IVB.

ACDR That panel's really going away.

CC-H Roger, Tom.

CC-H Apollo, Houston. One cleanup on the switches on panel 3. S BAND AUX TV we need to OFF.

21 05 40 DMP AUX TV. It's OFF.

CC-H Okay, thanks, Deke. And also we've lost a telemetry parameter on O<sub>2</sub> TANK 1 QUANTITY. If you could read - give us an onboard readout, we'd appreciate it.

DMP Stand by 1.

CC-H Okay. No hurry.

ACDR Dick, we got a problem. It's so bright in that background, I can't see my COAS.

CC-H Roger. Copy.

21 07 08 CC-H Apollo, Houston. We're about 30 seconds from LOS. I'll give you a call - real short pass at Rosman at 6 - at 1 plus 38.

ACDR And I finally got the COAS back in. Finally.

21 07 24 CC-H Roger, Tom.

21 27 19 CC-H Apollo, Houston at Rosman for a real short pass; about 1 minute. How do you read?

ACDR Roger. Got a good hard dock. Looks real lined up, and all the latches are good.

CC-H Okay. Super, Tom. This pass is real short, so I won't bug you now. There are two or three things that we want to get from you, like the P52 data and the delta - EMS delta-V results, but I can pick them up at Newfoundland, and that's coming up at about an hour and 42 minutes.

ACDR Okay. Yeah. We're kind of busy now. We'll pick it up there, Dick.

CC-H Okay. No problem.

Day 196

21 27 49 DMP Couple of quickies you can look at, Dick. We're running high on SUIT TEMP here - a little over 70 degrees and also the GLYCOL EVAP on the SECONDARY LOOP is off scale high. Should be below 60.

CC-H Okay, Deke. We don't have data here, but we will be looking at those. I've got a couple of other parameters I'm going to need a readout from you on, also.

DMP Okay.

CC-H See y'all later.

DMP Let's see, I can give you the 52 data here, if you've got time to copy it.

CC-H We're going over the hill, Deke. Let me get it later.

21 28 24 DMP Okay.

21 31 38 CC-H Apollo, Houston. Newfoundland for 6 minutes.

CMP Copy.

ACDR Page 4-5 in the Launch Checklist connecting - Vance is connecting the DM umbilicals.

CC-H Roger, Tom. How do you read me?

ACDR Loud and clear.

CC-H Okay. Be advised, we're going to be sending one of our nominal commands here to the booster to enable the extraction maneuver to occur per the nominal Flight Plan.

ACDR ... and for your trajectory people, we - we each had to ... Deke and I had to ... down below us and out in front of us. ...

CC-H Apollo, Houston. Tom, you're fading in and out, and I'm only getting about half the - your conversation.

ACDR Right. I'll call you in a minute.

CC-H Copy.

Day 196

21 33 05 ACDR Yeah, Houston. Right now we're in the middle of this checklist. Deke's power is off. His comm power is off, but, also, it looks like Vance's headset went out, but we'll call you on that later. Over.

CC-H Okay, Tom. Copy. And, Tom, that in - that transmission I heard loud and clear.

ACDR Okay.

21 34 35 CC-H Apollo, Houston. We still have about 3 minutes here at Newfoundland. If somebody has time to read me the P52 data and Launch Checklist, that's fine. Otherwise, we can pick it up at Madrid.

ACDR Deke can get it.

DMP Okay, ready, Dick?

CC-H Yeah. Go ahead, Deke.

21 34 50 DMP Okay. Star 27 and star 43, all balls; minus 36, minus 1, plus 137; and we torqued at 35 minutes and 20 seconds.

CC-H Okay, Deke. Copy. Thank you very much.

DMP And, Dick, CP here. We found out why I lost comm. When I took the tunnel hatch number 1 out, why we dragged it through the tunnel and it turned off my HEADSET switch here on panel 9C.

CC-H Okay, Vance. Read you loud and clear now. One more thing. We've got a - we've lost a couple of TI parameters. If somebody's up around panels 2 or 3 and you can read us two quan - two points, we'd appreciate it.

ACDR Go ahead, Dick. I'm available.

CC-H Okay. We need O<sub>2</sub> TANK 1 QUANTITY.

21 35 55 ACDR TANK 1 QUANTITY is reading zero.

CC-H Okay. We're reading off scale low. Also, we don't think we have a problem there, but it's TI. Also, we need QUAD Alfa HELIUM TANK TEMPERATURE.

Day 196

ACDR           Getting - it's reading zero, also.

CC-H           Okay. And the same thing applies to that one.

CC-H           Apollo, Houston. We're 1 minute until LOS. I'll  
give you a call at Madrid at an hour and 51 minutes.

21 36 29   CMP           1:51.

21 41 05   CC-H           Apollo, Houston. Madrid for 3-1/2 minutes.

DMP           Okay, Dick. And it's worth noting on those gage  
discrepancies that they were reading okay when we  
went through our systems check so those things have  
dropped to zero here quite recently.

CC-H           Okay. We copy and we'll be taking a look at that,  
Deke. We do think that the - both the primary and  
secondary loops are working okay, and it'll be  
running a little warm for a little while, but we  
think it'll be doing fine.

DMP           Okay.

CC-H           One think we wanted to get from you was the results  
of the EMS delta-V test that you ran.

21 41 43   ACDR           Okay, EMS delta-V test was perfect.

DMP           That was minus 10.5, Dick.

CC-H           Okay, copy. And, incidentally, one thing - couple  
of things on the Flight Plan. We'll be getting  
the GDC/IMU comparison results down at the Vanguard.  
And also down at the Vanguard at about 2 hours and  
42 minutes - 44 minutes or so, we plan on delaying  
the PSM activation until tomorrow. The reason is  
because of the switch manipulations that we went in -  
went through on the pad, we think we probably have  
a little helium bubble in that line, and by doing it  
tomorrow we'll have the evening to think about what's  
the best way to get it out. We probably - we may be  
able to get it out without doing an extra purge burn.

DMP           Okay.

CC-H           In any case, it's no problem.

DMP Roger.

CMP And, Dick, we have the umbilicals connected to the DM, and the hatch is back in again. And all latches were good.

CC-H Okay, Vance, Thank you.

21 43 22 CC-H Apollo, Houston. We're about a minute from LOS. We'll see you at ARIA at 2 plus 27 and when we got another - got a little minute here, we can't help but ask you how Vance and Deke are both liking the zero g.

DMP It's super, man. Just can't believe it.

CMP Really savoring every event up here, Dick. It's really great.

CC-H Sounds like fun. Wish I was there.

DMP You bet. So do we. Tell you one thing is these TV cameras don't work any better in zero g than ...

21 43 51 CC-H (Laughter) Roger.

END OF TAPE



Day 196

ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

22 17 46 CC-H Apollo, Houston through the ARIA. How do you read?  
USA Loud and clear. ... ready to go.  
CC-H Roger. Again, the comm here is pretty poor, so we're just standing by.  
USA Understand.

22 24 33 CC-H Apollo, Houston. We're 30 seconds from LOS ARIA. Vanguard at 2 plus 43.

22 33 24 CC-H Apollo, Houston. Vanguard for 5 minutes.  
ACDR Okay. Houston, Apollo. Extraction was nominal.  
CC-H Super, Tom. Sounds real good. Then if somebody - Apollo, Houston. You still there?

22 33 52 ACDR Go ahead, Dick.  
CC-H Roger, Tom. If somebody has a chance during this pass, I'd like to get the BMAG GDC/IMU comparison results.  
ACDR Okay; Deke will give it to you.  
CC-H Okay; and as I said before, we're not going to do the PSM activation here. We'll pick it up later.  
DMP Okay. Want to go with the BMAG?  
CC-H Okay; I'm standing by to copy.

22 34 25 DMP Okay. NOUN 20 is 359.86, 016.48, 358.15; ... are 001.6, 017.2, 359.0.  
CC-H Excuse me, Deke. You - we had some extra noise on the line, and I copied the roll, pitch, and yaw, but - of the NOUN 20 - but nothing else. Go ahead.  
DMP Okay. GDC is 001.6, 017.2, 359.0. And delta-T is 30:00.  
CC-H Roger. Sounds good. And I'm assuming that was BMAG 2. Is that right?

DMP That's affirmative.

22 35 18 CC-H Okay. Great.

22 37 04 CC-H Apollo, Houston. We are about 1 minute from LOS. Goldstone comes up at 3 hours and 1 minute. See you there.

ACDR Okay.

DMP Those Earth obs guys will be happy to know - -

22 37 29 CC-H I'm sorry, Deke. Say again.

22 51 06 CC-H Apollo, Houston. Goldstone for 5 minutes.

ACDR We've maneuvered to ACM for the nominal attitude.

CC-H Okay, Tom. And if you'll give us ACCEPT, we'll give you a good state vector, and I've got a preliminary ACM pad when you're ready to copy.

22 51 27 ACDR Okay. You've got ACCEPT, Dick. Go ahead.

CC-H Okay; and I understand you are ready to copy the preliminary pad, Tom.

ACDR Give us about 10 seconds.

CC-H Oh, okay. Tell me when you're ready. No hurry. We've got about 5 minutes here.

ACDR Okay; we're ready.

CC-H Okay. Starting with NOUN 33. 003:41:01.59; plus 018.1, plus four balls, plus 000.2; 179, 193, 001; 005.8; 00:01. 0.6, 12.3. The weight: 32879; trims: plus 0.80, minus 0.52. Go ahead.

22 52 55 ACDR Okay. 003:41:01.59; plus 018.1, plus all balls, plus 000.2; 179, 193, 001; 005.8; 00:01. 0.6, 12.3; 32879. Pitch trim: 0.80. Yaw trim: minus 0.50. Over.

CC-H Roger, Tom. That's a good readback, and you'll notice on there that the delta- $V_C$  tailoff is not 13.0, and that's because on this short burn - for

this particular short burn, there was just no way that we could set it up to come out that way, but that number is correct.

ACDR I understand. Thank you.

CC-H Okay; see you later.

22 54 11 CC-H Apollo, Houston. Our uplink is complete. You can go back to BLOCK. Thank you much.

ACDR Roger.

22 55 32 CC-H Apollo, Houston. We're 30 seconds from LOS. I'll give you a call in Newfoundland at 3 plus 12. See you there.

ACDR Roger. 3 plus 12. Thank you.

CC-H Roger.

23 02 50 CC-H Apollo, Houston. Newfoundland for 6 minutes.

ACDR ...

CC-H And, Apollo, be advised, we do not have an update for the backup GDC aline pad and the star acquisition pad today. And also, if you - I've got some different high-gain angles if you have maneuvered to the preliminary pad attitude for ACM.

ACDR Okay, Dick. Go ahead.

CC-H Okay, these are good for the - the attitude for the preliminary pad: pitch, minus 78; yaw, 147.

23 03 35 ACDR Pitch, minus 78; yaw, 147.

CC-H Roger. And naturally I'm talking to you on - VHF in Newfoundland, and we'll - I'll talk to you on S-band when we get locked up.

ACDR Okay; I'll maneuver to that new attitude.

CC-H Okay.

DMP For your information, Dick, when we powered up that ATS, we got a horrendous background noise, and it seems to stay there.

CC-H Roger, Deke.

23 05 16 DMP Okay. Houston, how do you read through ATS?

CC-H I'm clear, Deke. How me?

DMP Cleared up; no noise. It's amazing.

CC-H How about that?

DMP We're getting an echo from you and - but we surely got rid of all that background noise since you came on the air.

CC-H Incidentally, Deke, I remember from one of the tests that we did down at the Cape when Crip was down there, that he had the same - same thing. When locking up, he had a tremendous loud noise, but as soon as we got a good lock, it went away.

DMP That's exactly what it is.

CC-H Okay.

23 09 45 CC-H Apollo, Houston. When you do this upcoming P52, here, just in the event PICAPAR doesn't work for this attitude, we think stars 42 and 45 will work.

23 10 56 CC-H Apollo, Houston. How do you read?

ACDR Read you 5 by, Dick. How do you read us?

CC-H Okay. I read you loud and clear, too. Comm tech said you'd called, and I didn't hear you. I wasn't sure whether we had a problem or not. I did make one transmission. When you do this P52, if PICAPAR doesn't work, we think stars 42 and 45 will.

ACDR Roger. I'll be right with you and copy that.

CMP And we wanted you to report to the Cape that they put a hitchhiker aboard.

CC-H Okay.

CMP We found a super Florida mosquito flying around here a few minutes ago.

CC-H (Laughter) Okay. Maybe you could think of a new experiment to do with him.

CMP No. I'm going to feed him to our fish.

CC-H Okay.

ACDR And, Houston, Apollo. Your preliminary pad will be the final pad for ACM. That's affirmative. Over.

CC-H Tom, I'm not sure - we have a final pad in work, and I'm not sure whether we are going to need to pass it up to you or not. We will have it ready here in just a second.

23 12 02 ACDR Okay. I've already loaded the preliminary one in the computer in case you didn't have a final.

CC-H Roger. I understand. We were watching you do that, and - and - but we do think we may have a final pad. I'll know here in just a minute.

ACDR ...

23 14 06 CC-H Apollo, Houston. Be advised you're GO with the preliminary ACM pad. Also, we're going to get ready to do about 10 minutes of a VTR dump. During the dump, you'll lose downvoice. In case I need to call you, I'll keep upvoice, and we're going to stop the dump a couple or 3 minutes prior to the burn. So I'll be - we'll have good voice during the burn.

ACDR Okay.

23 14 29 CC-H Okay. See you later.

END OF TAPE

Day 196

ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

23 25 40 CC-H Apollo, Houston. We've concluded the VTR dump, and we're standing by here again with you waiting for the burn.

CMP Roger. We're about to - to do it very shortly.

CC-H Okay. We're standing by.

ACDR Okay.

ACDR Okay. PITCH 1 on.

23 25 59 ACDR MARK it. YAW 1 on -

23 26 02 ACDR MARK it.

CC-H Apollo, Houston. We had - we - you have four good gimbal motors and good trims.

CMP Rog. Same here. Looking good. We're all set.

CC-H Right.

23 31 28 CMP Okay, Dick, are you with us in reading our DSKY?

CC-H I'm with you, Vance, go ahead. I'm - we're looking at the DSKY - -

CMP Okay, our residuals are 0 plus 10. EMS is reading minus 10.8 after the burn, but we set it up at 7.2, and we'll explain it later.

CC-H Okay, Vance, got it.

CMP Okay, we were on attitude and on time. And the first burn was sort of like getting hit by a - bumped by a truck in back.

CC-H Roger. When you guys get squared away and have the time, how about reading me the P52 data.

CMP Okay, Deke will pass it on. Just a second.

DMP Okay, we had star 42 and 45, all balls; minus 37, plus 9, plus 17; and we torqued at 03:26.50.

CC-H           Okay, Deke. Copy. Thank you very much.

23 32 59   CC-H           And, Apollo, Houston. We have not completed the VTR dump. We'll be getting that - back to that here in a few minutes; so when you get to the step that says turn the VTR POWER to OFF on panel 400, skip that.

              DMP           Okay.

              CC-H           And, Apollo, Houston. We're going to - we're going to start up the VTR dump again, so you'll lose downvoice, and I'll give you a call when we're back up.

23 33 28   DMP           Okay.

23 48 10   CC-H           Apollo, Houston. We've completed the VTR dump, and we're back up here for the ATS again for about the next 10 minutes.

              DMP           Okay.

              CC-H           Apollo, Houston. Now that we've completed the VTR dump, we can go ahead and get the VTR POWER switch, just that one switch on panel 400, to OFF.

              DMP           Okay, VTR POWER to OFF.

              CC-H           No, I'm sorry. Excuse me, Deke. Do not do that. We're still rewinding the tape recorder.

              CC-H           Apollo, Houston. Incidentally, I've got some high-gain angles for you. For the next ATS pass that comes up, either - you can write them either in the Rendezvous Book or the Flight Plan at about 4 hours and 42 minutes.

23 51 08   ACDR           Go ahead.

              CC-H           Okay, Tom. The pitch is minus 66 and the yaw is 078.

              ACDR           Roger. Minus 66 and 078.

              CC-H           Roger. And be advised the VTR TV was real good. Just a reminder; don't forget that when you're taking that with INTERLEAVER switch ON, your hot - your intercom is getting put on the video.

              ACDR           Roger.

Day 196

TAG Tape 196-05/T-4  
Page 3

CMP Hope it wasn't too bad.

CC-H No, it was colorful. No problem.

ACDR Did you get the TV of TD&E, Dick? Over.

23 51 53 CC-H Yeah, that was it, Tom. It was. We got some - some on-orbit TV before you switched the camera, and then we watched the TD&E. It looked like a spectacular shot as you backed out of there.

ACDR ...



00 13 18 ACDR Hello, Houston; Apollo. How do you read?  
CC-H Apollo, Houston. How do you read?  
ACDR Roger. Loud and clear.  
CC-H Okay, Tom, if you'll give us ACCEPT, we'll update your state vector, and I've got an NCl preliminary pad for you.

00 14 59 ACDR Houston, Apollo.  
CC-H Apollo, Houston. I'm sorry, we dropped into a real short keyhole there, and how do you read me now?  
ACDR Roger. Loud and clear, Dick.  
CC-H Okay, I read you with a little bit of background noise, but I can hear you okay, Tom, and I've got a preliminary NCl when you're ready to copy.  
ACDR Okay. We're ready to copy.  
CC-H Okay, starting with NOUN 33. 005:38:29.00; plus 063.5, plus four balls, plus 022.0; 181, 053, 001; 054.2; 00:03. The weight, 32818; trims, plus 0.71, minus 0.45. Go ahead.  
ACDR Roger. 005:38:29.00; plus 063.5, plus all balls, plus 022.0; 181, 053, 001; 054.2; 00:03; weight, 32818; plus 0.71, minus 0.45.  
CC-H Roger, Tom. That's a good readback. Let me tell you just a word just about the trajectory here. We have - we've gotten some tracking that shows a little bit of out-of-plane. However, the FIDO thinks that this plane change is so small, and he doesn't have a good handle on it. We've decided we will not do a plane-change maneuver tonight. There may be an out-of-plane component in the - in a phasing maneuver tomorrow, or we might have to do one at some point tomorrow. But, at any rate, there will be no plane-change maneuver tonight.  
ACDR Understand. Real fine. Thank you.

Day 197

00 16 31 CC-H Okay. Also, Tom, we do not have any CMC data here, so we've decided not to uplink the state vector in the blind; you can go back to BLOCK.

CMP Roger. BLOCK.

CC-H Okay. Two more things. We're ready for the VTR POWER switch, that's just one switch on panel 400, to go OFF. And we're wondering how you're coming on doffing the suits.

ACDR You cut out, Houston.

CC-H Okay, Tom, we wanted the VTR POWER switch to OFF, and we were wondering how you were doing in getting the suits off.

ACDR Okay, Vance's is off, and Deke's putting his in the bag, and mine's part of the way off.

CC-H Okay. I'll leave you alone.

ACDR Okay.

00 17 17 CMP And we have the VTR POWER switch OFF.

ACDR Okay. VTR POWER switch is OFF.

CC-H Okay. Fine. Thank you.

00 18 00 CC-H Apollo, Houston. We are going LOS here at Hawaii in about 15 seconds. I'll give you a call at Newfoundland at 4 plus 44. See you there.

00 34 59 CC-H Apollo, Houston through Newfoundland. How do you read?

CMP Loud and clear, Houston.

CC-H Roger. We're standing by, and we'll have you on the ATS when the time comes and we get locked up. See you there. And also the - you're GO for the NCl with the preliminary pad. There's no final pad required.

CMP Understand, GO, NCl, with preliminary pad. We won't be getting a final.

CC-H That's right, Vance. Incidentally, after we get locked up on the ATS and have good data, we'll get your target load and state vector in. We did not get it in, as you know, at Hawaii.

00 35 41 CMP Understand.

00 36 39 CC-H Apollo, Houston. How do you read on the ATS?

CMP Loud and clear on ATS.

CC-H Okay. If you'll give us ACCEPT, we'll get you a good state vector and the target load.

CMP Okay. You've got ACCEPT and POO. And we're getting an echo from you.

CC-H Okay. I'm reading you loud and clear, Vance.

00 40 27 DMP That was another HIGH O<sub>2</sub> if you guys saw it.

CC-H Roger, Deke. Copy.

CMP We get one every 10 minutes.

CC-H Rog.

DMP I'm eating my Gus Grissom memorial corned beef sandwich and it tastes delicious. ...

CC-H (Laughter) Roger.

CMP And, Dick. When's it looking like the shift to PSM will occur?

CC-H What we're talking about, Vance, is doing a procedure - since we're not going to do the plane change tonight, what we're talking about is doing a procedure at about 6 hours and 40 minutes, which is during the middle of an ATS pass, to square away the - our little minor worries about the helium bubble, and then we'll just shift to the PSM after that procedure is completed.

CMP Okay.

CC-H And we'll be getting back to you very shortly about what that'll be. But we figured we'll let the NCl burn come and go.

Day 197

00 41 51    CMP       Roger.

END OF TAPE

Day 197

ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

00 43 59 CC-H Apollo, Houston. For somebody in the LEB, on panel 230, we'd like the UP TELEMETRY switch to center, UP TELEMETRY.

DMP Okay.

CC-H Incidentally, we're - we're having dropouts on the data so we're holding up on uplinking your loads until we have a - we can monitor them real well.

DMP Okay. We've seen you do some uplinking, among other things.

CC-H That's right. We're just trying to take it kind of slow. State vectors are in, and target load will be up when we can.

DMP Roger.

CC-H Okay. As I was talking, we got the target load in also, so you can go back to BLOCK.

00 44 38 DMP Roger. BLOCK.

CC-H Apollo, Houston. Bo is back from his trip back from the Cape, and we're getting ready to hang over - to hand over. You guys have sure had a good start, and I'll see you in the morning.

CMP Okay, Dick. It has been nice talking with you here. We'll see you in the morning.

CC-H Okay. See you then.

DMP Thank you.

ACDR Thank you, Dick. It's been a great day.

00 46 50 CC-H Roger that.

01 02 22 DMP Houston, Apollo.

CC-H Apollo, Houston. Go ahead.

DMP Oh, okay, Bo. Hey, would you like a little data on P52?

CC-H Roger. Go ahead.

DMP Okay. Stars: 2 and 42. It was all balls, and then a minus 33, minus 11, minus 2. It was at 5:35:15. That must have been 5:05. I can't read my own writing.

CC-H Roger. I copied stars: 2, 42, all balls; minus 33, minus 11, minus 2; 5:35, and I didn't get the last number.

DMP Yeah, should have been 5:05:15.

CC-H 5:05:15. Roger. Copy.

DMP Roger. You made a quick trip over there, Bo.

CC-H It's been quite awhile since you people have been up there.

DMP Doesn't seem that way.

CC-H And, Deke, while I have you, do you have a DM delta-P?

DMP Oh, golly.

CMP Yes, we have that, Bo. It's minus 0.3, and that's the value that it's built up to since we put the hatch back in.

01 04 10 CC-H Roger. Understand. Minus 0.3 and, it's built up to that since you put the hatch in.

CMP Roger.

DMP For your information, the old biostack is running, and we're ...

CC-H Say again, Deke. We didn't copy that.

DMP Roger. Vance activated the biostack, and we are now about to start the ZFF.

CC-H Roger.

CMP Advised that the biostack was activated at 4:58, Bo. And the light was on after it was activated.

Day 197

01 04 59 CC-H Understand; 4:58 for the biostack.

01 08 26 CMP Houston, Apollo.

CC-H Apollo, Houston. Go ahead.

CMP Bo, we've noticed the last hour or 2, it seems like the temperature is increasing a little bit in the cabin. And it's not too hot yet, but it is up on the gage to about 77. Do you have any suggestions for cooling it down?

CC-H Roger. We'll look on that. We understand that it has been increasing, and it is now about 77.

CMP Roger. I wouldn't say that it's anything serious, but we're kind of looking ahead. If we had a way to get it a little cooler now, we'd probably like it.

CC-H Understand.

CMP Okay, Bo. We're going to start the maneuver, if it's all right with you guys.

CC-H Understand.

01 10 13 ACDR Okay; we're maneuvering, Bo.

CC-H Roger. Be advised that you will probably lose comm with us.

ACDR Okay. You must have made a fast trip back to Houston. Over.

CC-H Yeah, well, we stopped at ..., but it has been 5 hours and 20 minutes since you launched.

CMP How did the launch look, pretty good?

CC-H Oh, it was great. It was a nice day; you could see staging on the television just fine, although you couldn't see it from the ground out the window too well. But it was really beautiful.

DMP Man, you should have seen it from where we were.

CC-H Yeah, I'll bet you it really looked great to you, Deke.

DMP Certainly did.

DMP There may be something else that is almost as good, but it's been so long since I've seen it, I couldn't compare.

CC-H Deke, we're having a bit of a problem understanding you. We think it might be that your mikes have slipped out from in front of your lips.

01 11 22 DMP Just as well.

01 27 07 USA Houston, Apollo. How do you read?

CC-H Apollo, Houston. We read you clear but weak.

USA Okay, ... look real good ...

CC-H Roger. Understand you're standing by for the burn. And just reminder to bank B.

01 27 35 USA Roger. Understand.

01 45 18 CC-H Apollo, Houston through Hawaii for 2 minutes. How do you read?

DMP 5 by, Bo.

CC-H Roger. I have a couple of items. Is there someone free to copy?

DMP Yeah, go ahead.

CMP Go ahead, Bo.

CC-H The LM ascent data which goes on page 1-6 of the Rendezvous Book - I'm sorry, that's 1-7 of the Rendezvous Book, is 27818.

CC-H And we're going to do a purge burn, and that's going to be done at about 6:30, and we'll have more information when we get into ATS coverage.

01 46 07 ACDR Roger. Purge burn at 6:30. Would you repeat the first one?



CC-H Roger. LM ascent data on page 1-7, which is about the center of the right-hand side; CSM weight, 27818.

CMP We had a keyhole. Please repeat. We had a cutout.

CC-H Roger. That's 27818.

CMP Okay, 27818, Bo?

CC-H Roger. And on panel 377, we'd like you to put the GLYCOL TO RADIATORS SECONDARY to the NORMAL position.

CC-H Did you copy that, Apollo?

DMP Roger. Copy that.

01 47 07 CC-H Roger. And we're flowing coolant through the secondary loop to cool you off some. And we'll get back with that problem when we have next communications pass.

DMP Okay. You're intermittent, Bo. We're only reading you periodically.

CC-H Roger. Let me try that again. We're doing that to cool you off and we'll have more information when we have another comm pass.

DMP Copy.

DMP Hey, could you repeat the position you wanted on 377, please, Bo?

CC-H That was GLYCOL TO RADIATORS SECONDARY to NORMAL.

CC-H And, Apollo, Houston. We'll see you again at Bermuda at 6:15.

DMP 6:15. And Bo, for your information, our water quantity gage is oscillating continuously ... a little bit, then it quits.

CC-H Roger. It's the water quantity transducer we understand is bad.

01 48 28 DMP Well, just oscillating and it's doing it only in the WASTE position; only at about 60 to 80 percent.

CC-H That was 60 to 80 percent, right.

DMP Yes, 60 to 80. Just a constant oscillation.

01 48 51 CC-H Roger.

02 06 23 CC-H Apollo, Houston through Bermuda. How do you read?

DMP 5 by, Bo.

CC-H Roger. Would you please go ACCEPT so we can give you the rendezvous REFSMMAT.

DMP Okay, you've got her.

CC-H And if you - if I can have someone's ear for a second, I'll explain a little more about the cooling procedure.

DMP Okay, we're all listening.

CC-H Roger. We're going to hold this configuration for awhile, to see if that helps. And we will probably also activate the secondary evaporator later on this evening so it cools the cabin down well before sleep.

DMP Sounds like a good idea.

02 07 05 CC-H Okay, now I have a procedure here for this PSM purge, and what we're going to do is essentially turn off the RCS quads, turn on the PSM, and then simultaneously with both hand controllers, command sime - opposite rolls for 12 seconds to burn out any possible bubble that may be there.

ACDR Yeah, okay. We got it copied down, Bo. We're going to turn off four RCS quads, turn on the PSM, and then opposite rolls using the two hand controllers for 12 seconds.

CC-H Roger. And we have a significant procedure here, but we'd like to go through it over Ascension, and go through it step by step with you so that if we lose ATS coverage, we'll be able to still have you at Ascension.

02 07 59 ACDR Okay.

Day 197

TAG Tape 197-01/T-5  
Page 7

CC-H They're just afraid that when you go opposing rolls, there may be some residual rate that might put you out of our ATS window.

ACDR Okay.

CC-H Apollo, Houston. You can go back to BLOCK, and as soon as you can get that P52 out, that would be good, so that we can then work on this purge procedure.

ACDR Okay. Stand by.

02 08 44 ACDR And you have BLOCK, Bo.

CC-H Roger.

CC-H And, Apollo, Houston. We're standing by for high-gain acquisition when you have a chance.

ACDR Okay.

02 09 40 DMP Okay, we're showing good signal on ATS. You guys reading us?

CC-H Apollo, Houston. Say again.

DMP Okay. We're transmitting on ATS, I think. Are you reading us?

CC-H Roger. Reading you loud and clear.

02 09 58 DMP Okay.

02 14 24 ACDR Houston, Apollo. Are you reading my DSKY?

CC-H Apollo, Houston. We are not reading your DSKY because we're dumping the DSE data, and also we have quite a bit of interference, and we an - It's difficult to understand your transmission.

02 14 42 ACDR Okay, Bo.

END OF TAPE

Day 197

ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

02 15 00 ACDR Okay. Vance just finished option ...  
CC-H Apollo, Houston. Our communication is so bad we're not reading you.

02 18 49 ACDR Houston, Apollo.  
CC-H Roger, Apollo. Houston here. We read you loud and clear now.  
ACDR Roger, Bo. We completed the P52 option 3 and also option 1.  
CC-H Roger. We did not read that because we were dumping data, so if you could give them to me, I'd appreciate it.  
ACDR Ready to copy?  
CC-H Ready.

02 19 11 ACDR Okay, on the P52 option 3; stars 01, 41; NOUN 05, four balls 1; X, minus 39; Y, plus 3; Z, plus 33; torqued, 6 hours 24 minutes and 0 seconds.  
CC-H Understand. Stars are 01, 41, four balls 1; minus 39, plus 3, plus 33; 06:24:00.

02 19 40 ACDR Roger. Now on option 1, star 01, star 41, the same ones; NOUN 05, all balls; NOUN 93, plus 35.4, plus 42.3, plus 14.0; and we torqued at 6 hours 27 minutes and 40 seconds. Over.  
CC-H Understand: 01, 41, all balls; plus 35.4, plus 42.3, plus 14.0; 06:27:40.  
ACDR Roger.  
CC-H Thank you.  
ACDR And I guess we're coming up to Ascension now. We're ready to copy the - the purge burn procedure.  
CC-H Roger.

02 21 03 CC-H Apollo, Houston. This procedure is fairly long, and we think it might just be easier if we let you do it as we read it over Ascension.

ACDR Okay.

CC-H As you prefer though.

ACDR Go ahead.

02 21 23 CC-H Okay, this is the PSM activation first. It's SCS CONTROL, MODE CMC FREE.

02 21 33 ACDR Okay, SCS control is CMC in FREE. All right.

02 21 38 CC-H SM RCS QUAD HELIUM A, B, C, and D, closed. Talkback, four to barber pole. And we're not at Ascension yet so don't do them until we get there.

02 21 50 ACDR Okay. Understand. Next step, SM RCS QUAD HELIUM, four closed; talkback barber pole, and we're holding on.

CC-H Roger. And do you want me to continue with the procedure then and you copy it?

02 23 13 CC-H Apollo, we have data through Ascension.

CC-H Apollo, Houston. How do you read?

CC-H Apollo, Houston. Over.

CC-H Apollo, Houston. Over.

CMP Go ahead, Bo.

02 24 25 CC-H Roger. We have Ascension now, and you can start on that procedure, and I'll continue when you're ready.

02 24 32 CMP Okay, we've been hearing you all along. You haven't heard us, and we're closing four SM RCS QUAD HELIUMS now.

CC-H Roger.

CMP And that's complete.

Day 197

Page 3

02 24 46 CC-H And the next is the SM RCS PROPELLANTS, four, A, B, C, and D, closed. Talkback, eight, should be barber pole.

CMP Houston, do you read me?

CC-H Roger. We read you. The next step is SM RCS PROPELLANT, A, B, C, and D, closed; talkbacks: eight, barber pole.

CC-H Apollo, Houston. Did you copy my last?

CMP Houston, Apollo. How do you read?

CC-H Roger. We read you loud and clear. How do you read me, sir?

CC-H Apollo, Houston. How do you read us now?

CC-H Apollo, Houston. How do you read us?

CMP Loud and clear.

CC-H Roger. We read you now also.

CMP We've been reading you.

CC-H I'm sorry then for making so many calls. We haven't been reading you.

02 27 20 CMP Roger. Just meant that it must have been some kind of a mixup through the station or something. Okay, we did close SM RCS QUAD HELIUM, Bo.

CC-H Okay, and now - -

CMP And four barber poles.

02 27 33 CC-H - - and now we need the SM RCS PROPELLANT A, B, C, and D closed. And talkback, eight should be barber pole.

02 27 44 CMP Okay, we have four SM RCS QUAD PROPELLANTS closed, with eight barber poles.

CC-H Roger. Then the SM RCS PSM HELIUM, OPEN; talkback, gray.

02 27 59   CMP       Okay, PS HELIUM, OPEN; talkback, gray.

          CC-H       And SM RCS PSM PROPELLANT A, B, C, and D, OPEN;  
                  talkback; four, gray.

02 28 16   CMP       Okay, complete. We have PSM PROPELLANT A, B, C,  
                  and D, OPEN, and four gray.

02 28 23   CC-H       And then the SM RCS PSM MANIFOLD ISOLATION, OPEN;  
                  talkback, gray. And we'd like you to do it, but it  
                  already should be done.

          CMP       That's right. It's a verify, but I'll hit it again.  
                  And it's gray.

          CC-H       And then BMAG MODE, three, RATE 2, and that's a verify.

02 28 46   ACDR       Verified, Bo.

          CC-H       AUTO RCS SELECT, 16, MAIN A, MAIN B.

02 28 58   ACDR       They're selected to 16, MAIN A, MAIN B.

          CC-H       And then ROTATION HAND CONTROLLER NORMAL POWER,  
                  two of them to AC/DC.

02 29 11   CMP       Two AC/DC - two NORMALS, AC/DC.

          CC-H       Roger. And MANUAL ATTITUDE ROLL to ACCELERATION  
                  COMMAND, and PITCH and YAW in RATE COMMAND.

02 29 26   ACDR       Okay, ROLL in ACCEL COMMAND, PITCH and YAW in  
                  RATE COMMAND.

          CC-H       Roger. And then listen here for just a second.  
                  What we'd like you to do is, using the - the rota-  
                  tion hand controllers 1 and 2, simultaneously com-  
                  mand plus and minus roll for 12 seconds of continuous  
                  command time, and that will be eight jets on. And  
                  try to get them on and off at the same time. Of  
                  course, you might have some variations, and it's  
                  possible you might lose comm with us.

02 29 57   CMP       Understand. And we're still in CMC FREE. Under-  
                  stand we should go to SCS now, is that affirm?

CC-H Negative. We'd like you to do it in ACCEL - -

CMP Okay.

CC-H - - COMMAND.

CMP Okay, understand, CMC.

CC-H And then after the burn, we'd like you to go MAN  
ATT ROLL to RATE COMMAND, SCS CONTROL MODE to CMC  
AUTO and allow the DAP to damp the rates.

02 30 27 CMP Roger. Understand.

CC-H And then - -

02 30 29 CMP And we're ready to start a plus and minus yaw for  
12 seconds.

CC-H And then let - It's a plus and minus roll for  
12 seconds, and let me finish the procedure in  
case we happen to lose comm with you

CMP Roger; roll.

02 30 43 CC-H And after the AUTO - after the burn, do the AUTO  
RCS SELECT ROLL, four to OFF, RHC NORMAL POWER 1  
OFF, and then do a VERB 49 maneuver back to the  
sleep attitude that's listed in the Flight Plan  
at approximately 6:25, which is 018, 170, 330.

ACDR Roger. We've got that.

CC-H Okay. We're watching for your burn.

02 31 16 CMP Okay. We'll start the plus and minus roll in a  
few seconds.

CC-H Roger. And Houston - Apollo, try to be careful  
not to modulate that, so you don't get any differ-  
ential roll out of one hand controller or the other.  
We're watching.

02 31 44 ACDR Complete.

CC-H Beautiful is the word we get down here.



CMP Okay. Looked good here. No big rates.

CC-H Roger. That's just what we thought.

02 31 58 ACDR We're already maneuvering back to our sleep attitude.

02 33 12 DMP And, Houston, Apollo.

02 33 31 CC-H Apollo, Houston. If someone has a second, we'd like the burn report from NCl.

02 33 38 ACDR Okay, I've got it here. Stand by.

02 33 50 ACDR Okay, on NCl, it was on time. The residuals, minus 0.1, plus 0.1, minus 0.1. Delta-V<sub>C</sub> after trim was 14.1. Everything was all right.

02 34 06 CC-H Roger; copy. I have a couple of items - -

ACDR ...

CC-H - - Apollo, for the presleep checklist if somebody has a chance to copy. When they do, just give me a call.

02 34 23 CMP Stand by.

ACDR Stand by.

02 34 31 CMP Houston, while we're digging this sleep checklist up, I have another thing, a little nagging problem here. We don't know if we have a problem or not, but it concerns the urine system. We've hooked up the urine system, but it is either dumping overboard at a very slow rate, or not at all. We find that it's such a slow rate that there's still some urine left in the collector after several minutes, after it has been used. We wonder if somebody down there knows what the flow rate should be?

CC-H Roger. We copy your problem.

CMP And advise that we followed the procedure and verified the URINE DUMP HEATERS, ON, and all that sort of thing.

CC-H Roger. I understand.

02 35 37 DMP Okay, Bo. I'm ready to copy your preflight [sic] checklist data.

CC-H Roger. The first one is in the CSM systems checklist on page 1-47: number 9, the VTR cooling activation. And on page 1-48: number 12, the USBE cooling activation.

02 36 12 DMP Okay, got it.

02 36 14 CC-H And, like you, we see both of those pieces of equipment getting slightly warm. And while in STDN contact, you could do this now. On panel 274, we would like circuit breaker DM POWER, MAIN B, CLOSED. And we'll call you when to open it - and it's so that we can get some data from the DM.

02 36 38 DMP Okay, you want it CLOSED now?

CC-H Roger. We have data, and we can watch it.

02 36 44 DMP Okay, it's CLOSED.

CC-H And on panel 181, CM 1 TV STATION POWER switch OFF, and CM 2 TV STATION POWER switch OFF; and that's on the presleep checklist.

DMP Okay, you want them OFF now?

02 37 10 CC-H Yes, we do want them OFF now, and we would like to know if they were ON at this time.

02 37 19 DMP No, neither one of them were ON.

CC-H Roger. Thank you very much.

02 37 30 CC-H And those are all the notes we have for you.

DMP Okay, ...

CC-H And, Apollo, Houston. We've gotten enough - -

DMP ...

CC-H - - DM data. We can - you can pull the circuit breaker on panel 274, DM POWER MAIN B to OPEN.

DMP           Okay.   Coming OPEN.

02 38 03   DMP           MARK it.

          CC-H          Thank you.

          DMP           And if you want your scientific report for the day, zero g does not seem to disturb the adult female mosquito, who's flying about here beautifully.

          CC-H          Roger.   Understand.   (Laughter)   Understand you're going to feed him to the fish.

          DMP           Well, we thought we would feed him ourselves for a few days, and then we'll feed it to the fish.

          CMP           Another alternative is to bring him back alive and give him a pair of astronaut wings.

          CC-H          Roger.   And has our activation of that valve down on 377, GLYCOL TO RADIATORS SEC, made any difference in the cabin temperature?

02 38 51   CMP           Yes.   It's beginning to improve.   Feels much better.

          CC-H          Thank you.

          CC-H          And, Apollo, Houston.   We'd like to know if you think that that's going to be a good enough thing, or if we should try something else to make the cabin still cooler.

02 39 19   ACDR          Yeah.   The trend is starting to get cooler, Bo.   If it keeps on, it should be in good shape.

02 39 24   CC-H          Understand.   Thank you.

02 41 36   CC-H          Apollo, Houston.   I have an answer to one of your questions.   The urine will dump 1.25 pounds per minute.

          CMP           Okay.   Then, we've got somewhat of a problem with this urine system because it isn't dumping anything close to that rate.

          CC-H          Okay.   And we're looking into the problem further.

Day 197

CMP Okay. If - it may turn out that we can use a backup scheme here pretty quick. We might have to use a bag or something because it's been quite awhile.

CC-H Understand.

CMP Or how about dumping without the filter?

CC-H Understand. We're looking at it.

02 42 25 CMP Okay.

02 42 27 CC-H And the other is that we need a waste-water dump, and we'd like you to time it instead of using the gage. And we would like a 4-minute waste-water dump, and you can start any time.

02 42 39 CMP Understand.

02 47 07 CC-H Apollo, Houston. Over.

ACDR Go ahead.

CC-H The first suggestion on the urine dump is to close the WASTE STOWAGE VENT valve while you are dumping urine, and see if that helps.

02 47 25 ACDR Okay.

02 47 26 CC-H And the other is that there is a filter in our - R-11, and we don't want you to dump without a filter, but you may try a new one.

CMP Okay. A new filter of the same type. Roger.

CC-H Yes. But we'd like you to try the WASTE STOWAGE VENT valve first.

CMP Understand.

02 47 48 DMP Okay. We've already turned that off.

CC-H Apollo, Houston; understand. You said you've tried to dump with the WASTE STOWAGE VENT valve off, and it didn't seem to help any.

02 48 06 DMP No. We haven't. I just turned it off now, Bo.

CC-H Okay.

02 48 10 DMP We'll have to check it here in a minute.

02 49 32 ACDR Okay, Bo. The WATER DUMP is OFF.

CC-H Roger. Understand.

02 50 34 ACDR Bo, we changed the filter and that greatly improved it.

CC-H Roger. Understand - -

ACDR ...

02 50 38 CC-H - - Thank you.

02 55 08 ACDR Houston, Apollo.

CC-H Apollo, Houston. Go ahead.

ACDR What country are we over now, Bo? We didn't have time to get the map out.

CC-H You're coming up over Australia right now.

ACDR Okay. Thank you.

CC-H You're welcome.

02 55 35 CMP How's it going over in Soyuz, Bo? Any - anything new? I suppose those guys are asleep by now, huh?

CC-H Roger. They've been put to bed.

02 55 55 CC-H Vance, looks like the only problem they've had so far is a problem with one of their TV cameras, and they're working on that to see if they can get it to work.

CMP Okay. Well, it's good that they haven't had any more problems than that.

02 56 11 CC-H Roger.

Day 197

02 56 43 CC-H Apollo, Houston. Just asked you a question on that waste dump. We understand it's working properly now. Did you do both of those steps, or did not the WASTE STOWAGE VENT make any difference and then you put the filter in?

02 57 02 DMP Well, I don't think it's working yet, Bo. I was just about to experiment with it, but it still seems to be full of liquid.

02 57 09 CC-H Understand.

DMP ...

02 57 13 CMP We think there's some suction in the device because if you close the cap for a little while and then put it to VENT, you hear a hissing which is quickly over again, but it must be a very small flow - flow restriction of some kind.

02 57 32 CC-H Understand, and we - -

CMP How about - -

CC-H - - just have a little while until LOS, and we'll be seeing you at Guam at 7:16.

02 57 41 CMP Okay.

03 06 32 CC-H Apollo, Houston through Guam for 4 minutes. How do you read?

DMP Roger. 5 by, Bo.

DMP How do you read us?

CC-H Apollo, Houston. We read you, but very weakly. Would you speak louder, please?

03 06 50 DMP Roger. Read you 5 by, Bo.

CC-H Roger. How was your test?

03 06 57 DMP Nothing seems to be working. We'll try her later. Right now, we've diverted to the food intake mode.

03 07 07 CC-H Roger. Enjoy yourself.

DMP Thank you.

03 07 11 CMP And we went to HEATER B on URINE DUMP. Thought you wouldn't mind. Just in case A wasn't working.

03 07 22 CC-H Roger.

03 07 27 CC-H And, Apollo, Houston. We don't think that's it. Our temperatures seem to indicate the heaters are working.

03 07 34 CMP Okay.

03 08 38 CC-H Apollo, Houston. On that urine receptacle, we have the suggestion, although you may have already done it, to take the URA off the hose and see if there's flow, which indicates that the URA would have a blockage.

03 08 54 DMP Okay, Vance ...

03 08 57 CMP Okay, Bo. Try it first opportunity.

03 09 00 CC-H Roger.

03 10 27 CC-H Apollo, Houston. There's less than a minute until LOS. We'll see you at MILA at 7:45.

03 10 33 DMP Okay, Bo.

03 XX XX CC-H Apollo, Houston. Through MILA and ... We may have a keyhole here in about a minute. How do you read?

USA ...

CC-H Roger. First is, we'd like you to go ACCEPT.

USA Roger.

CC-H And I have a note. On the next ATS acquisition, try to acquire at the normal time but leave the antenna in MANUAL and WIDE until 15:36:30. Then go to REACQ and NARROW.

USA Okay, have you had any trouble with the S-band plugging up?

CC-H Well, this is the one of two ATS passes when the Moon's position may interfere with ATS acquisition and this procedure is to get around that.

USA Okay, say again the time when we go to NARROW.

CC-H 15:36:30; but, of course, we're going to be updating the clock right now.

USA Roger.

CC-H Apollo, Houston. How do you read?

USA Loud and clear.

CC-H Roger. Did you have a chance - have a chance to do that URA test?

USA Not yet. We're right in the middle of the eat period. When we get this all squared away, that'll be our first priority.

CC-H Roger. We won't bother you while you're eating, then. Call us when you're finished.

03 XX XX USA Thank you.

END OF TAPE

NOTE

No time or voice was recorded on the tape from 03 10 33 forward; the transcript printed was typed as received from the mission commentary provided by the Public Affairs Office.



Day 197

ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

03 57 07 CC-H Apollo, Houston through ATS. How do you read?  
ACDR Loud and clear, Bo.  
CC-H Roger. We're standing by, and we've got some information here. We'd like this to be our last pass of the evening so you people can get to bed.  
ACDR Okay. Stand by. Let me get the Flight Plan out.  
CC-H Oh, negative. We don't want to interrupt your meal. Just when you're finished, give us a call.  
ACDR Okay.

03 57 57 CC-H Apollo, Houston. There are about 35 minutes remaining in this ATS pass.  
ACDR Okay, Bo.

03 58 22 ACDR Okay. I see you're giving us the STDN uplink, jet-on monitor loads, and all that.  
CC-H Roger. They're in work.

03 59 33 ACDR Okay, Bo. And you want me to go ahead and close that DIRECT O<sub>2</sub> valve that's listed back in 7:40. It's in the middle of an eat period. We're running late on the eat period because of some problems we had with the ...  
CC-H Roger. I'll check.  
CC-H Apollo, Houston. Roger; go ahead and close it.

04 00 10 ACDR DIRECT O<sub>2</sub> is CLOSED.  
CC-H Roger. And the cabin temperature seems to be stable now. If it's acceptable, leave the system the way it is configured. If it's too warm, you're clear to activate the secondary evaporator as on S/1-18. But if you do activate it, it should be deactivated before bedtime.

ACDR Okay.

CC-H And, Apollo; how is the cabin now?

ACDR It's better. But it still can be a little cooler. It's coming down some, though.

CC-H Roger. Are you going to activate that evaporator, sir?

ACDR Yeah. We'll go ahead and activate it for a short period of time.

CC-H Roger. We'd like to see that during this pass if you could do it.

04 01 25 ACDR Okay. I'm going to go ahead and power down this power down check. Let's turn the BMAG OFF.

CC-H Roger.

04 01 45 ACDR B - BMAG 1 POWER is OFF.

CC-H Copy.

04 02 25 CC-H And, Apollo, Houston. We've already done one wastewater dump, so you don't have to do another one as called out at 15:30 in the Flight Plan.

ACDR Okay.

04 03 03 CC-H Apollo, Houston. Are you finishing up there to answer a couple of questions?

ACDR Yeah, go ahead. We're - we're still munching and working. Go ahead.

CC-H Okay. It was about the URA test. Have you had time to accomplish that?

ACDR No, we haven't. We're still just right in the middle of the - of the eat period, Bo.

CC-H Okay. If - -

ACDR To get the first meal squared away and all the trays, it runs lots longer than the Flight Plan calls for.

Day 197

04 03 29 CC-H We kind of figured that. You have used that filter and it can be stowed in a fecal bag in R-11.

ACDR Okay. That's the used filter - -

CC-H That - -

ACDR The one we used in the fecal bag in R-11.

CC-H That's right. That's for the used filter.

04 03 47 ACDR Understand. Thank you.

04 04 21 CC-H And, Apollo, Houston. This is another discussion item. We heard you say that the EMS read 14.1 after the trim on NCl, and this indicates about a 1.1-foot-per-second overspeed, not shown by the G&N. And could you tell us anything about that, or could you tell us anything about the EMS setup that may have accounted for that.

04 04 58 ACDR Hang on, Bo. I'll go back and look at the data.

CC-H That was NCl and you told us, "On time, minus 1, plus 1, minus 1, and 14.1."

ACDR That's right; minus 14.1 ... We - we set the - EMS delta-V was set for 54.2.

CC-H Understand; 54.2.

ACDR That was before the burn. That's what it was set at.

CC-H Understand.

CMP On NCl, we set the EMS up initially before the burn just per the pad to - what you said. And on the burn before that ACM, however, we set the - we set it up to 7.2 instead of what you had on the pad, which was 5 point something.

CC-H Roger. Understand NCl, the EMS was set up per pad, but on the ACM, it was set up for 7.2. Thank you.

CMP And that was mainly because we were sort of wanting to set it up according to the G&N total delta-V, and to be sure that we didn't - if we had an SCS burn, that we didn't go through zero on the EMS before the burn started.

CC-H Roger.

04 10 11 CC-H Apollo, Houston. You can go BLOCK on the computer, and you have a GO to synchronize with the clock.

ACDR Roger. After we get all the food trays off ... we'll do that.

CC-H Okay.

04 10 44 CMP You getting any TV, Bo, of the meal?

CC-H Negative. We are receiving no TV.

04 10 52 CMP Okay.

04 28 10 ACDR Hello, Houston; how do you read?

CC-H Apollo, Houston. Go ahead.

ACDR Okay, Bo. We're going to start the - activate that secondary ... Then we'll go right into troubleshooting on the urine system.

CC-H Roger.

04 30 43 ACDR Houston, the S-band's coming through pretty loud and with static. But we got the secondary evap on.

CC-H Roger, Apollo. We see it.

04 33 15 CC-H Apollo, Houston. Over.

ACDR Go ahead, Houston.

04 33 25 CC-H Roger. Have you had a chance to do that URA test?

04 33 37 ACDR It's at work right now. The secondary evaporator is activated, Bo, and we're at work on the urine system right now.

CC-H Okay. We saw the activation of the secondary evaporator, and we were just wondering about this urine system before we went over the hill. Got about 3 minutes until LOS.

04 34 21 CC-H And, Apollo, Houston. If there's someone who is not working on the urine system, I've got another item or two.

Day 197

ACDR Okay, Bo. Be right with you.

CC-H Okay.

04 34 44 CMP Houston, Apollo.

CC-H Go ahead.

CMP We - we took this device off the urine system, and checked the hose. And there is a very small vacuum on the hose, and we think we improved the vacuum on the hose by taking off the bleed valve on the waste stowage outlet. And maybe it'll help if - if we keep the BATTERY VENT CLOSED - the bleed off the waste stowage and then try to use this system.

CC-H Roger. Copy.

CMP We'll - we'll proceed on and let you know.

CC-H Roger. Do you think it'll be acceptable to go to bed with?

CMP Pardon?

CC-H I mean, can you people go to bed comfortably with its present situation?

CMP We think so. (Laughter) We're working on it.

CC-H Okay. And we've noticed the OPTICS POWER is on, and we'd like the VERB 74.

CMP Okay.

04 35 50 ACDR You want a VERB 74? You got the VERB 74.

04 35 57 CMP And OPTIC - OPTICS POWER's OFF.

CC-H Roger. We see the VERB 74. There is 1 minute until LOS, and your wakeup time in the morning will be at 24:30, which is about 40 minutes late because of STDN coverage.

ACDR Roger. At 24:30.

CC-H And, Apollo, Houston. We think that allowing a little air to flow through the urine system will help it.

04 37 05 CC-H Apollo, we're just about to go LOS, but we'll see you here at Guam in about 2 minutes.

04 37 10 CMP Okay; fine.

04 40 17 CC-H Apollo, Houston through Guam for 2 minutes.

04 41 03 CC-H Apollo, Houston through Guam for just a little over a minute.

CMP Roger.

04 41 23 CC-H Apollo, Houston through Guam for 1 minute. We will have LOS and see you at Goldstone at 16:41, but we will not call. You can call us if you wish.

CMP Okay. We'll probably send you down a presleep report. And we'll be - we'll just about be ready to sack out then, Bo.

04 41 44 CC-H Roger. Thank you. And - -

CMP We'll - and we'll probably be able to give you a final status of the urine system up here about that time, too. It's a little more optimistic looking now. It has - we have our optimistic and pessimistic moments up here.

04 42 09 CC-H Roger (laughter); understand.

05 09 22 CC-H Apollo, Houston through MILA for 3-1/2 minutes.

ACDR Bo, we're in the process of taking the probe out and putting the cryo freezer in the tunnel.

CC-H Roger; understand. And we'd like to remind you here before you go to bed to turn off the secon - secondary evaporator. And if somebody's got a pencil, I've got some new ATS angles for you.

ACDR Stand by for just a minute, please.

CC-H Okay.

05 10 34 ACDR Bo, go ahead.

Day 197

CC-H Roger. For this next pass, you normally wouldn't have any, but they are minus 1 and 257 and then just REACQUIRE and NARROW and leave it that way for the night.

ACDR Okay. Pitch, minus 1; yaw is 257. You say leave it that way in NARROW and leave it for the night.

CC-H Right - Roger. And it should be left in REACQUIRE and NARROW.

ACDR Roger. REACQ and NARROW.

05 11 12 CC-H And one last question before we leave you and that is, what was the resolution on the urine system?

ACDR Well, it looks like it's starting to work better now. We pulled the - that waste stowage - you know, disconnecter we've been using to bleed out to the cabin to enrich the O<sub>2</sub> that shared the vacuum line with it, and we have a better vacuum with that on.

CC-H Understand.

05 11 39 CMP Houston, Apollo.

CC-H Go ahead.

CMP Let me give you a couple of things on the presleep checklist.

CC-H Ready to copy.

CMP Okay, BAT C volts are 37, PYRO BAT A volts are 37, and PYRO BAT B volts are 37.

CC-H Roger. C, PYRO A, and PYRO B; all 37.

CMP Rog. And we've done all steps except the following. We have not cleaned the suit circuit return screen behind panel 382 because we think it's a short time, and we've - we're holding on the waste management overboard drain and that sort of thing until we're all through for the evening. And we're just now putting the freezer - or the - yeah, the tank in the tunnel. That's about it.

CC-H Roger. And there's about 30 seconds until LOS.

CMP Roger.

CC-H And we're going to say good night now unless you need to talk to us again at Quito or when we get into ATS coverage.

CMP Okay. See you in the morning. Or somebody.

05 12 54 DMP Good night.

CC-H (Good night.)

END OF TAPE



Day 197

ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

05 22 32 ACDR Hello, Houston; Apollo.  
CC-H Apollo, Houston. Go ahead.  
DMP All right, Bo. We got a problem. We can't get the probe out to stick that wonderful little freezer up there.  
CC-H Understand. You can't get the probe out.  
ACDR Yeah, Vance will tell you about it. Here - -  
CMP Okay, Bo. Everything in the probe removal checklist on the cue card is going - has been going great up through step 11. Step 12 is "Capture latch release, tool 7." You insert it in the pyro cover. You turn it a 180 degrees clockwise to release the capture latches. Well, here's where the problem is, and let me explain it to you. If - do you have somebody there that knows the probe that can listen?  
CC-H Roger. Go ahead.  
05 23 27 CMP Okay, as I look in the back of the probe - in other words, at the back of the pyro cover, I'm looking with my flashlight through the hole where I insert this tool, and there's something behind the pyro cover that's in the way that's preventing me from putting this tool all the way in. And as I look at it, it's - it's actually one of the pyro connectors. It happens that this tool has to go down through the pyro cover in between, normally, some pyro connectors. But one of these pyro connectors has rotated such that it's in the way, and I can't put this tool in.  
CC-H Roger; understand.  
CMP Now I suppose that one thing I could do is take the cover off - the pyro cover off - and I've got proper tools to do that.  
05 24 34 ACDR Bo, what it's coming down to is a decision we ought to make pretty soon. We've been up pretty late and this whole thing about sticking the cryo freezer up

there came about because of the ventings. And either we're going to stay up another 3 or 4 hours wrestling that probe or else we're going to call it quits.

CC-H Roger. We copy and we're talking about it right here now.

CMP Incidentally, I stuck a pencil down in - or a pen down in there to see if I could easily move that pyro connector out of the way, and it doesn't seem to want to move.

05 25 13 CC-H Understand.

05 28 04 ACDR Houston, Apollo.

CC-H Apollo, Houston. Go ahead.

ACDR Okay, Bo. Looking up here at the mechanical mechanisms involved, it's obviously - it's going to take quite a bit of coordination with you people down there, and it's going to take quite a bit of time. And what I'm proposing is right now we just put the hatch back and go like we were going to originally. Just leave the little old freezer right here, because we'll spend 4 or 5 hours working on that bear.

05 28 28 CC-H Roger. We agree with you. We think we'd like to bump up the pressure of the O<sub>2</sub> in the cabin and sleep with it that way, and we're looking at the problems right now.

ACDR Well, except - yeah, we got a problem. We can't get the hatch closed.

CMP Hatch 1 will not go back in, of course, unless we go through a process of trying to retract the probe so that it'll let the hatch fit. How would it be if we slept with the hatch on?

CC-H Roger. We'll get to you with a suggestion here in just a couple of minutes, Vance.

CMP Okay.

05 29 21 CC-H Apollo, Houston. We concur with your suggestion not to work on that this evening. We just want to look

Day 197

TAG Tape 197-04/T-8  
Page 3

for a configuration so that you can sleep with the freezer in the cabin.

05 31 26 CC-H Apollo, Houston. Over

ACDR Go ahead.

CC-H Roger. What we'd like you to do is to close the over - overboard dumps, if you're finished with the urine system, then take off the lid to the cryo freezer, boost up the cabin pressure to 5.5, replace the lid on the cryo freezer, and that should be an acceptable sleep configuration.

ACDR Okay. Now, let's go over that again. When we're finished with the urine system, go - put that QD back on the waste vent.

CC-H Negative.

ACDR How about repeating that, Bo?

CC-H We'd just like you to close off those vents - the waste stowage vents - -

CMP Yeah. What you want us - yeah, what you want us to do is close the vents, that's overboard drain and the - well, the battery and the waste, all vents down on - on the panel R-11. You'd like to have us pump the - take the top off the cryo freezer, pump the cabin pressure up to 5-1/2 psi, put the top back on, and that should be a safe configuration.

CC-H That's right, and the procedures for that cryo freezer are on page 1-3 of the Experiments Checklist, number 10, if you need them.

CMP Okay.

CMP Bo? Houston?

CC-H Apollo, Houston. Go ahead.

05 33 57 CMP Roger. Just more information regarding the probe. Whenever we do something with that in the morning, or whenever - It looks like I can take off the fairing on the back to move this little connector out of the way if I retract the probe. There are

three screws that allow you to take this fairing off - pyro cover, they call it. And - but there's another - and they're easy, but there's another little screw down on the side that looks like you can only get at if you have the probe retracted. So, if the approach is to take that fairing off, why that's just some information for you. The probe is now in a retracted state.

05 34 43 CC-H Understand. You looked like you could take off the fairing and the pyro cover by loosening three of the screws, but there's another screw that might require the probe to be retracted.

CMP That's correct. And it's not retracted now, but it would have to be retracted, it looks like.

CC-H Roger. Understand.

ACDR Okay, Bo. And you want the pressure bumped up now, right? Before we shut the freezer.

CC-H Roger. After you've opened it, we'd like you to bump the pressure up and then close the cover again.

05 35 18 ACDR Okay. I got DIRECT O<sub>2</sub> on. Pressure's coming up.

CC-H Apollo, Houston. And we'd like to remind you again to close all of those overboard vents if you have not done so.

CMP Okay. We're doing that.

ACDR Okay, Bo. Could you brief us on - In the past, you said we weren't supposed to have the cover open - off for over 40 seconds, and we're holding it while we're bumping the pressure here.

CC-H Roger. Keep it open until the pressure is equalized and then replace the pressure - then replace the cover.

ACDR Okay. If you've got a digital readout, Bo, you might help us. Looks like I've got about 5-1/8 pounds per square inch. If you - you got a better readout down there than we have, and you've got telemetry.

CC-H Roger. We'll give you a call.

ACDR Okay. Thank you.

05 38 13 ACDR We're reading about 5.253, Bo.

05 38 21 CC-H Roger. We read 5.23.

05 39 17 ACDR And I'm reading about 5.4555 on the gage now.

05 39 24 CC-H Roger. We read 5.43.

05 39 48 CC-H Apollo, Houston. We read 5.50 now. You can shut off the DIRECT O<sub>2</sub>.

05 39 53 ACDR DIRECT O<sub>2</sub> off, Bo.

CC-H And when the cover goes back on the cryo freezer, torque the bolts down with the tool, if you have it.

ACDR Roger.

CC-H Apollo, Houston.

ACDR Go ahead.

05 42 02 CC-H Roger. We'll be working on the probe tonight and we're sure we can figure out some way that you'll be able to get it out of there in the morning. And have a good night's sleep. And one last item, and that is the SECONDARY EVAP CONTROL. We need it OFF before you go to bed.

ACDR Will do it. Thank you, Bo.

05 42 18 CC-H Good night.

END OF TAPE

Day 197

TAG Tape 197-05/T-9  
Time: 197:06:30 to 197:08:00  
Page 1

ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

REST PERIOD - NO COMMUNICATIONS

Day 197

TAG Tape 197-06/T-10  
Time: 197:08:00 to 197:08:25  
Page 1

ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

REST PERIOD - NO COMMUNICATIONS

Day 197

TAG Tape 197-07/T-11  
Time: 197:12:21 to 197:13:50  
Page 1

ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

12 47 40 (Music: "Good Morning Sunshine" by Chicago)

12 48 19 CC-H Good morning, Apollo. We're talking at you through the Vanguard. Got you for 5 more minutes.

DMP Hello down there. You reading us?

CC-H That's affirmative, Tom. Good morning.

DMP No. This is Deke. Good morning.

CC-H Oh, good morning. Good morning, Deke.

DMP Mighty pleasant wake-up music.

CC-H You guys up and moving around yet?

DMP No. We weren't until you called.

CC-H Well, that's good, glad you're getting plenty of sleep. The - as soon as you get the sleep rubbed out of your eyes, I have a couple items for - before we go over the hill here to make sure that we got good comm at the next ATS pass.

DMP Okay. Give me about 10 seconds and I'll take it.

CC-H Okay. No, I just - you don't need to write it down or anything. I just want to talk to you, but we got about 3 or 4 minutes here, so no rush.

DMP Okay. Go ahead.

12 49 43 CC-H Okay. When you get in and take a look at your Flight Plans for this morning, you'll notice that the normal stuff scheduled under the AC for terminating the "jet on monitor" and then proceeding on down through a VERB 49 maneuver - and it's listed at 24:00 hours. We'd like to make sure that we do get that maneuver in prior to our scheduled acquisition at - of the ATS - which is scheduled for 24:50; and it is currently 24:30.

DMP ...



12 51 27 CC-H Okay. We're a couple of minutes from LOS and next station contact will be through the ATS at 24:48. I might remind you, this morning, it's called out for you to take the WASTE STOWAGE VENT valve to VENT, and due to the problems we had with the urine dump yesterday - we recommend that you delay that until you guys are finished using the facilities. Also, we'd like to hear how they're working a little bit later on.

ACDR Okay. It worked okay - I guess the last time I tried it last night. We'll fill you in shortly.

13 14 37 CC-H Apollo, Houston talking at you through the ATS for 45 minutes.

CC-H Apollo, Houston. AOS through the ATS for 45 minutes.

DMP Roger. Read you 5 by ...

DMP Houston, how do you read?

CC-H Read you loud and clear, Deke.

DMP Okay.

CC-H How are things going up there this morning?

DMP Oh, we're just kind of getting regrouped here since we woke up.

CC-H Deke, I'm sorry. You're - you're barely readable.

DMP Is that any better?

CC-H Oh, yes. Much.

DMP Okay, got to get my mike in closer again.

CC-H Appreciate it.

13 15 56 CC-H Know you guys are trying to get everything pulled together this morning. We've done a little investigating into the problem Vance ran into with the probe last night, and like he basically came up with - we know what to do about it and know what the problem is, so whenever everybody gets all pulled together, we can talk about that a little bit.

DMP Okay, that's encouraging. Stand by. I'm going to put on a headset right now. I'll try to get breakfast in a few minutes.

CC-H Okay. There's no rush at all. You guys get your morning business taken care of. One other item for the morning, we'll - some time when you get it all pulled together - we'll need the morning status report, too.

13 16 35 DMP Well, I can give you that right now since we're talking about it. Just a second.

CC-H Okay. You're getting kind of far away from that tube again.

DMP Okay. Ready for status, Dick - -

CC-H Ready to copy.

DMP You read me now?

CC-H Yes, sir. Read you loud and clear. Go ahead.

DMP Okay. I'll give you a status report on the AC. He ate everything except - let's see here - one shortbread - three shortbread cookies. Comment: All the cookies were crumbly; uneatable. Then, as far as PRDs, got a 1001; about 7:15 sleep, good; no medication; and he's full of water.

CC-H I didn't copy that about the water.

13 18 01 DMP Okay. CP ate everything except fruit cocktail and had a lemonade in addition. He couldn't find it; that's the reason he didn't eat it. And his PRD is reading 480 and he had about 7 hours of sleep; the guesstimate is fair; and he took two scop/Dex yesterday. Yeah, that was strictly prophylactic, we should note. He had no symptoms at all, and didn't have any indication that he really needed them, but he just took them for advice. And fluids, he estimates about 50 seconds on the water gun. Okay, and the DP ate everything but the steak yesterday. And the PRD reads 1001; and sleep - it's hard to guess, - 5 to 6 hours of super sleep; no medication; and water, I don't know, 14-16 gulps, I guess. Anything else you need?

CC-H Okay. The only thing I missed there was Tom's fluid intake. Would you repeat that again, please?

DMP Yeah. He's full of water.

CC-H Full of water. Understand.

13 20 43 CC-H DP, Houston. Just to make sure if we understand on those PRDs, we need five-digit indications, and can we assume that there were zeros in front of that, or what?

DMP You were cut out by Moscow. Could you give me that one again?

CC-H Okay. We under - we need five-digit indications on the PRDs, and can we assume there were zeros in front of those numbers that you read me this morning?

DMP Well, I thought there was a 6 in front of mine. Stand by and I'll see if the other guys can see anything else.

CC-H Okay. Appreciate it if you would go back and take a look at those, and we do need the - all six digits, please. I'm sorry. All five digits.

13 23 09 DMP Houston, we're getting an awful lot of yakking between the comm techs here on the ...

DMP Okay, Crip; if you're still reading, you can put a 1 in front of Tom's reading on the PRD.

CC-H How do you read me now, Deke?

DMP Read you okay.

CC-H Okay, fine. I just copied a 1 in front of Tom's reading, and I need to get also clarification on Vance's and yours. And we had a dropout there momentarily through the ATS, and we're back with you again now.

DMP Yeah, what happened is we had a couple of comm techs between someplace and Moscow yakking away there for a while. ...

CC-H We're working on that; squared away.

DMP           Okay, Crip. How do you read?

CC-H           Reading you loud and clear, Deke.

DMP           Okay. Vance's PRD is 48029.

CC-H           Okay. 48029.

DMP           That's affirm.

13 26 24   CC-H           Okay. And I'm standing by for yours.

DMP           Oh, I thought I gave you 5.

CC-H           All right, you said you thought it was a 6. Can I -  
is that correct?

DMP           I'll look at it again. Yes, it still looks like a 6.

CC-H           Okay, understand, 61001.

DMP           Right.

13 27 07   CC-H           Okay. I guess that's got all that.

DMP           We're trying to get going on a BAT A charge here.

CC-H           Okay, fine. Incidentally, awhile ago when we dropped  
out of ATS, we - there were two things there I guess  
- we've got a little problem, and that every time we  
change a mode down here to set up for a tape recorder  
dump and a few other things, we're going to lose you  
briefly on - through the ATS - on voice and I'm going  
- we'll try to give you a call and let you know that's  
going to occur, but what you were hearing on the comm  
techs was not supposed to occur and we are going to  
try to square that away.

DMP           Okay.

DMP           Okay, Crip. We're charging the BAT here and I'm  
reading about 2 and a quarter amps but only 33 volts.

CC-H           I copy. 2.4 amps and 33 volts?

DMP           Actually, about 2.2 - 2.3 amps. According to our  
checklist, the voltage should be higher than that.

CC-H Okay. I'm being informed here, Deke, that it's going to start up slow and be that way about 15 or 20 minutes. Then it'll come up.

DMP Okay. Hey, and Crip, also we're going to turn on the secondary evaporator in here. It's still pretty warm and trying to get things cooled off a little.

CC-H Okay. I understand. You did activate the secondary evaporator? Or did not?

13 29 24 DMP We haven't yet, but we are going to.

CC-H Okay. We - let us take a look at that for a minute and get back with you then.

DMP Okay.

CC-H DP, Houston; you got a GO on going ahead and activating the secondary evaporator.

DMP Okay, thank you.

13 30 41 CC-H Incidentally, Deke, last night I guess Bo called up to you about hooking up suit hoses to the VTR and the ATS S-band equipment, and we saw that still setting fairly warm last night. We assumed that that was not done. Is that correct?

DMP Yeah, you are right, that wasn't done. I guess we must have got distracted with the probe business up there.

CC-H Okay. No big sweat. I guess what we're going to get later is to get you to hook the hose up to the VTR and hold up on the S-band in that we are going to need the other two hoses for mixing with the docking module later on.

DMP Okay.

13 31 32 CC-H And when you all do have an opportunity to hook that up, well, if you'll give us a status report on - that you have done it, we'd appreciate it.

DMP Okay. It's the mundane things up here, Crip, that are eating our lunch. You know, like that darn urine thing, and it took us about 2 hours to eat last night. Just all the folderol involved in that ...

CC-H Yeah, I appreciate that, yeah. Getting it all squared away initially is - going to do it. I assume this upcoming breakfast is probably going to take a little time, too, so don't let us get in your hair.

13 32 09 DMP Okay, thank you.

13 35 32 DMP We now have a strawberry-colored spacecraft. Just had a juice bag break.

CC-H Spill much?

DMP Doesn't take much up here to seem like a lot.

CC-H Understand.

CC-H Just what you need to make your day, right?

DMP It'll get off to a good start.

CC-H Roger. Incidentally, your friends up there just got off their circ burn and it's all in good shape, so they're in orbit waiting for you.

DMP Oh. Superb. Great.

DMP Incidentally, it takes an awful lot to spoil your day up here, Crip.

CC-H I would imagine. Feel pretty good?

ACDR You better believe it, never felt better.

DMP There may be something better, but it's been so long since I've seen it, I couldn't really tell you.

CC-H Roger that.

13 40 35 CC-H Apollo, Houston. We'd kind of like to get a status report here about - when you might like to talk about this probe problem and consider working it. I know you're kind of busy having breakfast there; can you talk about it a few minutes now?

DMP Yeah, we can listen, Crip, if we don't have to write anything down here.

CC-H Okay, well, why don't I just talk here at first; I don't believe it's going to be necessary for you to write anything down, and maybe we can go over a little bit later and jot down some specific steps.

13 41 11 DMP Okay. Go ahead.

CC-H Okay, per Vance's description last night of the problem, we went back and did some investigation, and sure enough we turned up some closeout photos that show one of the, indeed, one of the connectors is sitting over your connection point for your tool to release the capture latches. And what Vance had suggested about getting that cover off and going in there and correcting it seems like the prudent way to go. You're going to have to go ahead and get the probe - jack it back out, though, to be able to access the area good. And there is one little nut down on the side of the pyro cover that has to be removed, and you can get - get at that with your ratchet W, and socket number 1. And it doesn't look like much of a problem to get it off. I'm sure Vance probably remembers that once - you get that nut off to release the cover, you got to squeeze it together, and it takes a pretty good squeeze to - to squeeze it, and then pull it out. But that doesn't look like much of a problem at all. We're - once we get in there, we'd kind of like to verify the colored dots with the connectors to make sure we know which one's connected to where, since we have got the problem, but we're pretty sure that - which connector it is - which was the - red one, which according to procedures, should have been the one that was fired on the - the docking. So it looks like the used one is the one that's the problem. Now, if that is the problem, that particular connector looks like it might be a little bit difficult to get in and release. And if it is, there is one right beside it, which is the yellow-dot connector that can - you got a little bit more access to, and it can be pulled off to allow you to rotate the red one back around out of the road, and then reinstall the yellow one. But - I think we can probably leave some of that to your discretion. When you get in there, take a look at it, and see how - see how much access you can get a hold of. Remind you, you've got to get the pliers, which is part of that pin straightener kit. If you think you need those to work on it. We do want - after we get it

all squared away, we would like to get it back re-installed - so that we've got a working probe just in case we do need it for something a little bit later on. However, that red connector, if it's any problem reinstalling it, does not have to be reinstalled, and - all you've got to do is - just tape it securely out of the road so that it won't interfere when we're retracting the probe. That's a brief rundown of the thing, and if you'd like to go down to specifics, we'll be happy to do so.

DMP Okay, Crip. Vance thinks he understands all that; only thing we'd like to be sure of is the right tool numbers to ...

CC-H Okay. And that's no - no big deal. It's the ratchet handle which is tool W and the socket which is number 1.

13 44 44 DMP Okay.

CC-H And all you got to do is to, basically, go through the procedure like you're extending the probe - not extending it, pardon me, let me get the words right - like you're installing the probe. Go through those procedures to get it jacked back out and to allow you to have access to it, and it shouldn't be any problem.

DMP Okay, but we didn't read that. Could you try it again? They're reading through the squawk box when I'm on headset, we get that feedback squeal.

CC-H Okay. No, all I was saying is that what he is going to have to do since we think that you left it partially removed last night, you probably - you are going to have to go through the installation procedures with the exception that you don't have to hook up any - any umbilicals, of course, to get it back where you've got access to work on it.

13 45 55 DMP Okay.

END OF TAPE



Day 197

ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

13 52 06 CC-H DP, Houston. Deke, when it's convenient, would you give us a readout on the battery charge current and voltage, please?

DMP 37.6.

CC-H 37.6 on the voltage - what was the amps, please?

DMP 2.1.

CC-H 2.1.

DMP Rog.

CC-H Than you very much. That allows EECOM down here to keep a pretty good idea of what your battery status is.

13 56 49 CC-H Apollo, Houston. I'm going to lose you on the ATS, here, shortly. And we'll pick you up through Guam in about 4-1/2 minutes. Little reminder, when you get a chance, that we got a P52 that's scheduled for about now, and I'll be needing to pick it up pretty soon because toward the end of this night period, you're over - rolled over, looking at the Earth, and it's not too good an attitude. Also, when somebody gets a chance, we'd like - we think the battery vent valve was closed last night and we need to get that opened, if it is. And also, if everybody's finished with their morning chores, well - the WASTE STOWAGE VENT valve can go to VENT.

14 01 30 CC-H Apollo, Houston. We are AOS through Guam for 7 minutes. We see the P52 in progress.

CMP Roger, Crip - and we're doing the P52.

CC-H Roger that, Vance.

CMP Crip, are you getting data on our P52?

CC-H We're looking at it. That's fine.

CMP Okay. Then we won't give you the report; we'll just let you watch it.

CC-H That'll be good, Vance.

CMP There's your NOUN 93's.

CC-H Okeydoke.

CMP Okay. Torque 25:43:20.

CC-H Roger.

CC-H Apollo, Houston. For the CP. As soon as you finish up with that P52, you can then get back to P00 and you can give us ACCEPT. We'll go ahead and uplink your state vectors.

14 04 28 CMP Roger. Giving you ACCEPT now.

14 05 50 CMP Houston, Apollo.

CC-H Go ahead.

CMP On this probe thing, Crip, do you want me to start working on it before we hit ATS or would you rather have us do it over ATS?

CC-H Vance, what we'd recommend is you go ahead and press into it and then if you have any problems, we can work them when we get to the ATS coverage.

CMP Sounds like a good idea.

CC-H Apollo, Houston. We're 1 minute from LOS. We have the state vectors in, so you can go back to BLOCK. Our next station contact will be through Santiago in 32 minutes at 26:19. That's 26:19. I'll be saying good morning to you and turning you over to Richard. He'll be talking to you there. We'll see you in the morning.

CMP Okay, Crip. Real good. Nice talking with you.

CC-H Roger.

14 07 34 CMP And we're going back to BLOCK.

CC-H Roger that.

14 36 12 USA Hello, Houston.

Day 197

14 39 07 CC-H Apollo, Houston. Hello at Santiago for 4 minutes.

ACDR Hello, Dick. How do you read us?

CC-H Loud and clear, Tom. How me?

ACDR Okay. Vance is working on taking this baseplate off of the probe, and it is really going rough. The screws were - he's got the three screws busted loose, but it seems like it takes tremendous torque. And he hasn't got the baseplate off.

CMP Okay. But I just found out something new here, Crip. It doesn't look like I'll have to take the baseplate off. I'm leaving the cover on right now, and through the side, I've been able to get the pyro connector with the orange dot off. And now I'm working on the one that's in the way, which - I think I'll be able to get out - get off - without removing the pyro cover. The one that's in the way is also orange.

CC-H Okay. Stand by just 1 second, Vance. I think we've had a slight misunderstanding in communications. But let me get right back to you. Hang on.

CMP To say that another way, I guess the one - I've just removed the connector with an orange dot, which is in the way of the connector I have to get at. And that's the connector with a red dot.

CC-H Okay, Vance. I think we may have misled you a little bit. What we had wanted you, originally, to do was not remove the three Phillips-head screws at the top of the pyro cover, but down on the side of the pyro cover - down at the base there's a little flange with a little hex nut in that you need W - tool W and tool 1. And if you just remove that one hex nut and then press on the cover, the whole cover'll come off in your hand. And then you can get directly down at the connectors.

14 41 13 CMP Okay. Very good. We got the hex nut off. But - I guess I just didn't press hard enough to get it off, and I thought - -

CC-H Yeah, it - -

CMP - - cover off - -

CC-H Yeah. It - yeah, when you get it off, you'll see why. But you do have to reach down to the sides, there. Just - and squeeze real hard. And there's just two little bitty metal flanges there that're holding it on - when you do squeeze it, it should just come right off in your hand. And it may take two hands.

14 41 36 CMP Okay. It's off.

CC-H Hey, super! Good.

CMP Okay, we have the offending connectors off, too, now. And I think we're in good shape now. It's just a matter of going back through the removal procedure and taking this thing off. And we can put connectors back together once we get the probe out.

14 42 04 CC-H Okay. Just a second, Vance. We're about 45 seconds from LOS at Santiago. The high-gain angles are good, so we'll be talking to you on the ATS here in just a second. We had intended for you to - after you got the pyro cover - to go ahead, remove the offending connector, and either reinstall it so it doesn't cover the tool place or tape it out of the way, install the other connectors, then reinstall the pyro cover, and then - now, we ought to be back to nominal, and you can go through the procedures to get the probe out.

CMP Okay. The only thing that bothers me is - I'm not sure there's anyplace to put that red connector easily, so that it won't be in the way. But I'll try.

14 42 51 CC-H Okay.

14 46 32 CC-H Apollo, Houston. Talking to you through the ATS. How do you read?

CC-H Apollo, Houston. Through the satellite.

DMP Rog. Go ahead, Dick.

CC-H Just letting you know we're locked up, Deke. And I read you loud and clear. How you doing?

DMP Okay. Fine. Just starting fuel cell purge here.

CMP Okay, Dick. Another progress report.

CC-H Okay.

CMP I'm putting the cap back on. I think we're all squared away now. I could not get the red connector back on without having it interfere. So I've left it disconnected. The other three connectors are connected. It - -

CC-H You want to know where that connector is?

CMP - - looks to me like all we have to do is put the screw on to lock down this cap and we're in Fat City. The reason you can't get that connector connected without having it interfere is the fact that it's on a wire that's too short.

CC-H Aha. Well, I tell you what - just for our curiosity, why don't you describe how you got it out of the way underneath the cap and - and then, we're happy that it's out of the way and not connected.

CMP Okay. I - the pressure release button is going to be my reference point, here. I've got it almost sitting on top of the pressure release - or pressure relief button. And it's kind of cocked in there sidewise. And I don't think it's going to do us any harm. What I could do, if it would help, is just let it dangle outside of the cap. That might be better.

14 48 46 CC-H Well, we wouldn't object with that. You might just get a piece of our old friendly gray tape and tape it to the outside of the cover. It's in R-6.

CMP Okay.

CC-H Whatever looks best to you, Vance. We just wanted to - try to understand the configuration so we'd know.

CMP Okay. It'll be outside of the cover and dangling. And we'll cap it off with some gray tape - tie it down.

CC-H Okay. Super. Just - as you keep working on it, if you'd keep us advised, we'd appreciate it. Incidentally,

the biostack should be off by now. The only reason I'm reminding you is - we're having all this talk about the - and all this business about the probe, and just didn't want to miss it.

14 51 41 CC-H Apollo, Houston. Vance, you still listening?

CMP Rog. Go.

CC-H Yeah, Vance. We're sitting here looking at the probe ourselves and the only - in taping the connector out of the way, the only caution that we'd like to point out to you is - is when you do fold the probe, that connector and its wire needs to be within the - well, at any rate, the - the probe cover is going to bury itself in - down in the probe when the probe is folded, so that the connector and the wire's going to have to be sure and not be in the way there.

CMP Okay, understand. And we'll watch for that. And that's a real good idea. You guys are really on top of this. You can see just what I'm looking at.

CC-H Yeah, I got one about 6 inches in front of my face, as a matter of fact.

CMP You'll know the back end of the probe very well after this exercise.

CC-H Oh, I wouldn't say that. But we'll try.

ACDR Dick, it wouldn't be a normal flight if we didn't have our little probe problems.

CC-H You're right, there.

DMP And - for future reference, Dick - if you think your TV is like looking through rose-colored glasses from now on, it's only because you're looking through strawberry-colored.

CC-H Yeah. I heard that - I heard that comment that the - you had a strawberry-colored spacecraft. What I was wondering was, did you have a strawberry-colored DP, AC, or CP?

DMP One - only the CP.

Day 197

CC-H Uh-huh. Okay.

14 53 32 DMP I'll swab this window off the best I can, and I think it's going to be all right.

CC-H Okay, Deke.

ACDR Dick, that makes two of those juice bags that have gone. Mine went yesterday, my orange drink, but I was able to catch most of it.

14 54 05 CC-H Okay, Tom. I'm not sure what we can do, except - if you'll just let us know when it happens.

ACDR You'll have a beautiful, psychedelic-colored spacecraft when we get back.

CC-H Well, good. I'll watch for it on the TV. Hey, listen. One thing that I had meant to tell you just a second ago. We're having a problem - a little problem with the water level in the waste-water tank. And one of the problems is - is that the SECONDARY EVAP - the good news is, of course, is - that it's keeping you cooler. But the bad news is - is that it sure likes eating up the water. So, if you could stand to turn the SECONDARY EVAP OFF and let us let the water level build up in the waste-water tank - right now, it's down to 20 percent - it would help us out on the consumables management.

CMP And - we have a valve in 382 that we turn on and off every time that we turn on the SECONDARY EVAPORATOR. Is it okay if we just leave that in AUTO all the time? I don't think you're afraid of any leaks down there, are you?

14 55 07 CC-H Okay, let me check.

ACDR The probe is out.

CC-H Hey, good, Tom.

ACDR Whoopee!

14 56 47 CC-H Thank you.

14 59 13 CC-H Apollo, Houston. Vance, in answering your question, the OFF position of that EVAP protects us against

sensor failure. Since, if you guys can put up with the temperatures, we are not planning on activating it and deactivating, at least very often, for the next several hours. What we'd appreciate would be just go ahead and turn it OFF and if you do it this once, it shouldn't bug us for a while.

CMP Okay.

CC-H Also, we are getting ready to go into a TV mode - TV downlink mode on the ATS that you ought to be aware of and as we change modes, we'll probably drop out comm here for just a second and we'll be getting TV so maybe we can see the strawberry-colored spacecraft.

CMP Okay.

CC-H And, Apollo, Houston. Has the probe removal allowed you to do the TV prep yet? Or is that not complete?

15 00 20 CMP That's not complete. We'll get on that.

CC-H Okay, fine. When you get it done, why don't you let us know and we'll downlink the TV then.

15 06 48 CC-H Apollo, Houston. We see the SECONDARY. You haven't had time yet to go ahead and deactivate the SECONDARY EVAP. We need to get - to go ahead and get it OFF so we can stop losing water in the waste-water tank.

CMP Okay. We're just finishing tying in the probe and drogue, and we'll drop that and get it right away.

CC-H Okay, Vance. Sorry to bug you but we're - the sooner we get it OFF, the less time we'll have to leave it OFF.

15 07 40 DMP Okay, we're going to reset, Dick, on the SECONDARY, and I assume you want the pump OFF too, right?

CC-H Stand by. No, Deke, we want to leave the pump ON because we are getting some cooling help out of the loop, but we do want to deactivate the evaporator and also down on 382 to get that valve that is hard to get to, to OFF.

DMP Okay.



15 08 51 ACDR Hello, Houston; Apollo.  
CC-H Go ahead, Tom.  
ACDR Yeah, Dick. We've got a question here. You know we have put the - that filter on, for launch on TV?  
CC-H Yeah.  
ACDR Okay, do we - and that's the only filter we've got and I guess - we could - coming along here to deactivate that? I mean, in other words, we get this TV prepped - just take the filter off and stow it. Right?  
CC-H Let me check, Tom; I'll be right back to you.  
CC-H Apollo, Houston. Tom, that's affirmative. The filter is to be taken off the camera and stowed in U-2 - it - for later particular setups using that particular bracket, you'll need it again, so be sure and just don't throw it away. Put it in U-2 so it can be found again.  
ACDR Roger, U-2.  
CC-H Okay.  
15 10 42 CC-H And, Tom, I didn't say it, but the same goes for the - the polarizing filters on those little lights also. Just take them all off, stick them together, and put them in U-2.  
15 10 57 ACDR All right, Dick. Sure will.

END OF TAPE

Day 197

ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

15 27 40 CC-H Apollo, Houston. Just so you don't forget us, we're still here. We've still got about 10 minutes left in the ATS pass.

ACDR Roger. We're trying to catch up here because of all the problems we had with the probe and everything. We've got all our TV's set up and they should be running and we're now going to start working towards the DM.

CC-H Okay. Real fine. We'll - go ahead and go to a down-link TV mode and get a little television and stay out of your hair. We still have about 8-1/2 minutes at this ATS pass, so I'm standing by.

15 32 49 CMP Houston, Apollo.

CC-H Go ahead, Vance.

CMP Okay. A question about the zone-forming fungi.

CC-H Okay, shoot.

CMP Of course, when we take pictures, the covers are open; the rest of the time, should the covers be closed or open? Just in between pictures.

CC-H Okay. Stand by a second; I'll get you an answer, Vance.

CMP Right.

CC-H Vance, we'd like the covers closed in between the picture-taking sessions.

CMP Okay. That's what we thought, thank you.

CC-H Okay.

15 34 38 CC-H Apollo, Houston. We're 2 minutes from LOS of the satellite; I'll be giving you a call down at Orroral Valley at 27:24, and we'll check your status in the checklist then. So we'll see you then.

CMP Roger. Understand.

CC-H Incidentally, Vance. We have been downlinking TV, and we've got a picture from both TV stations; it looks like the one that's pointed at the main display console may be a hair out of focus, but other than that, good pictures.

CMP Okay. We'll check it; see if you can get a better focus.

15 35 11 CC-H Okay. No problem.

15 46 38 CC-H Apollo, Houston. Short pass at Orroral Valley for about 3 minutes. How do you read?

CMP Loud and clear, Crip (sic).

CC-H Roger, Vance. How y'all doing?

CMP I estimate we are about 20 minutes behind the time line. Deke is just - getting ready to go into the DM.

CC-H Okay. Super.

CMP We just opened hatch 2.

CC-H Okay. Thank you.

CC-H Apollo, Houston. We are about 1 minute from LOS. We're going to have a short Santiago pass at 27:53; then we'll see you on the satellite. The high-gain angles in the checklist are good.

CMP Okay. Very good, Dick.

15 48 48 CC-H Okay, Vance. See you later.

16 13 08 CC-H Apollo, Houston. Santiago.

ACDR Roger. Go ahead.

CC-H Roger, Tom. I was just calling you to let you know that we are here and to check on where you were in the checklist.

ACDR Okay. We are activating the docking module.

CMP Page 1-4.

ACDR We're about 30 minutes behind.

CC-H Okay. When somebody gets a chance, you might pass down to me the time that the UVA lamp was turned on; that should probably be recorded on - in the Flight Plan. It was back on page 1-3.

ACDR Yeah. It was turned on at about 27 ... we have it recorded. Just log that, Vance, on the other page and give it to them there.

CMP Okay.

DMP 27:51:25.

CC-H Apollo, Houston. Say again, please.

DMP 27:51:25.

CC-H Okay, Deke. Thank you very much. We are about 30 seconds from LOS. We will see you when you get locked up on the ATS. We thought of one thing that will - probably would hasten the waste water tank filling up again, and that is, on panel 352, if anybody is left in the command module to close the potable water inlet valve. This will make sure that whatever water we do make goes into the waste tank.

DMP Okay. I'll do that in a minute.

CC-H Okay. No problem.

16 21 31 CC-H Apollo, Houston through the satellite. How do you read?

ACDR Read you loud and clear, Dick.

CC-H Roger. Me, too, Tom.

ACDR Okay. One thing that is a problem here - is the fact we got to do everything in series, the thing is so cramped.

CC-H Just from the - all the gear that's around, huh?

ACDR That's right, yeah. And when you put the UVA cable in, you can't do the fish experiment because once you

get behind in the time line - we're working it out, but things are just going slow because it's so damned crowded.

16 22 05 CC-H Roger. Understand.

16 23 51 CC-H Apollo, Houston. I need to know where you are in the checklist so we can plan this ATS pass. As you know, there's several things that had planned to be going on here, including the TV checkout and then, after that, the docking system checkout. Why don't you let me know where - where we are and - we can plan accordingly.

CMP Okay, Dick. Page 1-4, on the right side, and Deke is setting up the DAC right now.

CC-H Okay. Understand. And when you get into the next step on the TV installation and checkout - after that's set up, why don't you let us know, and we can - we'll get that out of the way.

CMP Fine.

CC-H Incidentally, we are coordinated with the Moscow Control Center to do a voice check when we get up to Eupatoria; that's about another 16 or 17 minutes from now. So when we get up there, we'll probably stop what we're doing and do that real fast, and we're going to do a voice check - first, from me here in Houston, and then from Overmyer in Moscow.

CMP Very good.

16 25 03 CC-H Okay.

16 36 08 ACDR Houston, how do you read through ATS?

CC-H Loud and clear, Tom. How me?

ACDR A-okay. Good shape, Dick. We're just slowly getting caught up on things here.

CC-H Okay. Where are you in your stuff, Tom?

ACDR Okay. On the Flight Plan, I've just transferred the life vests from F-1 to U-2. They're setting up - they

Day 197

finished a DAC O2 setup and the TV installation and checkout from the Flight Plan at about 28 hours there. We haven't got to the docking system checkout at all yet.

CC-H Okay, when you get to a point that you're ready to start the docking system checkout, let us know and we'll go back to DATA. And I understand that the guys are into the TV installation and checkout in the docking module. Maybe we can get on with the - looking at the color charts on the various cameras.

ACDR Yeah. They're not quite ready yet.

CC-H Okay. Fine. We're standing by and when they - when they are ready, just let us know and we'll start.

16 37 26 ACDR Roger.

16 38 38 CC-H Apollo, Houston. For your information, since we can go ahead and get some command module television, we're going to go ahead and go to a TV downlink mode and look at the command module TV. When we get set up in the DM, we'll switch over into there and do that work; so we'll be dropping out here for about 30 seconds, and then I'll call you back.

ACDR All right.

ACDR Houston, Apollo.

CC-H Go ahead, Tom.

ACDR Okay. One thing in this docking system checkout. I've been going through the procedures but - you know, extending the guide ring and all that, but the whole thing - they've got Deke doing the TV activation and checkout up there and he's the one that calibrates the thing and uses the camera. Little bit of a goof on the Flight Plan, I think.

16 40 50 CC-H Okay. Stand by just a second.

16 42 31 ACDR Okay. Dick, I can read you about 4 by 4. Understand you're transmitting through Eupatoria.

ACDR I can just barely read you - read you at all. Over.

ACDR        Okay.

ACDR        Houston, I can hear some just - wavy noise in the background.

ACDR        Bob, read you about 3 by 3 with a little echo, but once we got the probe problem squared away, we're doing okay. Just behind in the time line, and we'll be catching up. Over.

ACDR        Roger, Bob. Thanks so much. Tell everybody there hello, and we're pressing right on.

16 44 28    ACDR        Roger. Thank you.

CC-H        Apollo, Houston. I'm calling you back through the satellite now. How do you read?

ACDR        Loud and clear, Dick. And I read Bob about 3 by 3; I could understand him.

CC-H        Okay. We're going to have to take a look at exactly what - what the configurations were there. I was copying you down on air-to-ground - well, on - I believe through S-band through the satellite; but I was transmitting through Moscow. But we'll check it out; we may have to do another voice check at a later time.

ACDR        Roger, Dick.

CMP        Okay, Houston; Apollo. Do you see the color chart on the TV now?

CC-H        Okay. Stand by just a second, and let us switch cameras, and we'll look at it.

16 46 16    CC-H        That's affirm. We do have the picture here, and let us take a look at the colors.

DMP        Soon as you get through with that side, let me know. I've got a readability test for you on the other side.

CC-H        Okay, Deke. We'll let you know. We want to look at it for at least 30 seconds and - and - so stand by.

DMP        Okay. Go ahead, Tom.

Day 197

CC-H Deke, Houston. We're satisfied with this view now. Do you have the other TV camera on yet?

DMP Negative. We haven't got to there yet per checklist.

CC-H Okay, fine. When you get it on, we'll take a look at the - at the color chart from that camera.

DMP Can you read our readability sign?

CC-H Well, I'm trying to read it; hang on a second.

DMP Maybe I've got it upside down for you. Which direction should I turn it?

CC-H Bring it in a little closer to the camera if you can.

CC-H (Wally Schirra ...)

DMP Looks readable on our monitor anyway. Let one of your Russian friends read it.

16 48 20 CC-H Okay. We'll have to get one of those.

END OF TAPE



Day 197

ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

16 51 27 ACDR ...  
ACDR Houston, Apollo.  
CC-H Go ahead, Tom.  
ACDR Hey, how about doing me a favor, Dick. Check with the flight planners and the stowers and find out where the bracket is that we mount the 300-millimeter Nikon lens out the right window.  
CC-H Okay. Sure will do it.

16 53 39 CC-H Tom, Houston. It's in A-5, Alfa 5.  
ACDR Okay. Thank you.  
CC-H Okay.

16 57 33 ACDR Houston, Apollo.  
CC-H Go ahead, Tom.  
ACDR Yeah, looking back on the Flight Plan here at 28:10, it says, "Deactivate primary evaporator." Do we really want to do that as hot as this bear's running?  
CC-H Stand by.

16 58 05 CC-H Tom, that deactivation of the primary evaporator is to support the UVA COAS cal that's listed in the Flight Plan, at the start of the next night cycle at 28:30. So, if you don't think that we're going to be able to get the COAS cal because we're running a little behind, we can leave the primary evaporator running and we'll pick up the COAS cal at the - hopefully, at the next dark-side pass. We will have - -  
ACDR Yeah. There's no - there's no way we can get that. It'll have to be the next one, and we'll have to work all during eating period to catch up, here.

CC-H Roger. Understand. And, we - so leave it running and - but the - the direct answer to your question is, yes, it will have to be deactivated a few minutes prior to whenever it is we run the COAS cal.

ACDR Okay. And, look ahead when we get ATS coverage in daylight where you want to use that docking - instead of the docking system, I would estimate it would be over at about 29:35 or from there on. About 29:30 - 35.

CC-H Okay. We'll take a look and - probably at the tail end of this ATS pass if you guys will give us a good idea as to where you are, we can - we'll try to help you out on the Flight Plan.

16 59 37 CMP Houston, we now have the second TV camera hooked up in the DM if you'd like to look.

CC-H Roger. We are looking at it, Vance. It looks like the gray tape has unsticked itself. You might put the color chart back, and we'll look at it.

CMP Right.

17 00 23 CC-H Okay. We're looking at the view, guys. There is some shadow on the - and the cables are a little bit in the way, so let us just look at it here for a second and I'll get right back to you.

CMP Okay.

CC-H Okay. That's got everything out of the way of the color chart now, so if you can, stand by with all that spaghetti for a second and I'll get back to you.

CMP Right.

17 01 02 CC-H Okay. We're satisfied with looking at the color bar chart. Thank you much. You can press on with the checklist. Thanks, Deke.

DMP Okay. Roger.

CC-H Looks like y'all took some snakes with you, in addition to the mosquito.

DMP Yeah, you're right. We've got a real ranch up here.

CC-H Roger.

CMP We need a couple of crocodiles to go with them.

CC-H (Laughter) Roger.

17 07 32 CC-H Apollo, Houston for Deke or Vance - one of you guys in the DM.

DMP Go ahead.

CC-H Hey, listen. We think we might make a little money here by skipping step 12 and delaying the multipurpose furnace preparation and going ahead and doing step 13, which is the DAC/TV vibration test since we are - are locked up on television when we have about another 7 minutes left on the ATS. So, we'd suggest that you do step 13 and then - and then go back to step 12, if that's okay with you.

CMP Okay, fine. We'll jump into it.

17 08 09 CC-H Okay, fine. If you'll hustle, maybe we can just get it out of the way before we have LOS, and then you can go back and do the other one. Thank you.

17 10 45 DMP Hey, you guys ready down there, Dick?

CC-H Stand by just a second, Deke.

CMP Okay. Do you want us to turn the DAC on? We - we'll turn it on now, and we can turn it off if you want us to later.

CC-H Okay. Go ahead and turn it on and we're looking at the TV and we'll watch. Go ahead.

17 11 27 DMP Okay. It seems to be running.

CC-H Okay. Hang on just a second.

DMP And the old reading tester.

CC-H We guessed what it probably says, but - we still haven't seen it. Can you tilt the page a little bit away from you, Deke? In other words, tilt - the other way - the other way. No, it's got too much glare on it.

17 12 04 CC-H Deke, Houston. We're satisfied with the vibration test. For your information, we've got practically no vibration with the DAC running, so you can press on with the procedure and - we have some good guesses as to what that says, but we just can't read it because of that glare on the white page.

DMP Okay. And I'm glad you passed our reading test.

CMP Something about (turtle).

DMP It says (Are you a turtle?) That's a big question.

CC-H Okay. That's what we thought. We'll pass it on.

17 12 47 CC-H Apollo, Houston. We're just 2 minutes from ATS LOS. We're just going to drop out a couple of minutes. I'll call you at Orroral Valley.

DMP Okay.

ACDR Roger, Dick. We'll pick you up at Australia.

17 13 03 CC-H Okay. See you there.

17 16 46 CC-H Apollo, Houston through Orroral Valley for 6 minutes.

17 17 08 CC-H Apollo, Houston through Orroral Valley. We dropped out there for a second. I'm back up and standing by.

ACDR Okay, Dick.

17 21 00 CC-H Apollo, Houston. We're 1 minute from LOS. We'll give you a call at Quito at 29:27. See you there.

17 48 45 CC-H Apollo, Houston through Quito for 4 minutes.

ACDR Okay, Dick. We're still finishing up the DM activation, getting into the multipurpose furnace okay. We need to have a couple of decisions on the Flight Plan. Are we going to do that UVA obs or are

we going to extend the docking mechanism, or are we going to do the U - the cal on the UVA ... on that? Over.

CC-H Okay. That's - Tom, that's what we've been talking about during LOS and I guess to make an intelligent decision, we need to know exactly how far you guys have gotten in the docking - into the docking module checkout.

ACDR Okay, Dick. I'm about through here, actually. I've got to take the readings yet and close down. It should be in less than 5 minutes.

CC-H Okay. Fine. When you get the readings, I'll be standing by to get them, and, Tom, let me get right back to you. Okay?

ACDR Roger.

17 51 12 ACDR Houston, Apollo.

CC-H Apollo, Houston. Go ahead.

ACDR Okay, Dick. We haven't even thought about eating yet. We could skip that and work it - try to work it in later.

CC-H Well, we don't plan on you skipping it. We've - we are trying to juggle things for the afternoon and seeing how we can - how we can catch up. And we're talking about, now, what we want you to - how - how we want you to plan this next hour or so.

ACDR Okay.

17 52 11 CMP Houston, Apollo.

CC-H Apollo, Houston. We're about 30 seconds from LOS here at Quito. I'll see you when you get locked up on the ATS. Tom, what we'd suggest is - is during this - is that we do the docking system check - checkout in the Joint Ops Checklist after we get locked up on the ATS and also during this upcoming night period that we try to get this UVA COAS cal in and then break for lunch.

ACDR Sounds good.

17 52 42 CC-H And we'll be looking at this afternoon's schedule for the rest.

17 57 26 CC-H Apollo, Houston through Bermuda. How do you read?

ACDR Loud and clear.

CC-H Okay, Tom. We were close to LOS there. Let me just review what it is we are going to be doing in the next few minutes if - and then we'll get on with it. First of all, we would - when we get locked up good on the ATS, we'd like in the joint systems checklist starting on page 1-1 to go through the docking system checkout. After we get through with that, we plan on doing the UVA COAS cal and at that point, we'll just break and let you guys get a bite to eat. Also, when we come over the Russian site again, we plan to do a real quick voice check - once more.

ACDR Okay.

CC-H And in order to be set up for the UVA COAS cal, we'd like to go ahead and deactivate the primary evaporator.

17 58 27 ACDR In work.

CC-H Okay. Real fine.

CC-H Apollo, Houston. One comment on the docking system checkout - I don't think there is any confusion in your mind but just to make sure. There is a couple of places in the procedure that **it refers to** - a couple of notes where it says if we are checking system Bravo; for this checkout today, we are going to check out **system Alfa** only, so just ignore those notes. We will not be checking out system Bravo.

CMP I understand.

18 00 46 CC-H Apollo, Houston. We've - EECOM noticed that the EVAP OUT temperature is gone real low. You might check again through the procedure on deactivating the primary evaporator - make sure that the valves all went in the right direction.

ACDR Okay.

ACDR Yeah, we've locked up. Houston, are you ready for us to activate the circuit breakers?

18 02 24 CC-H Tom, yes. What I was just getting ready to call you was we've got data on the ATS. We want you to go ahead and start through the procedure, and when you - are you through with step 2? If not, when you get through with step 2, let us know and we'll proceed from there.

CMP We're finished with step 2; ready to proceed.

CC-H Okay. Proceed, go ahead. And let us know what you are doing, please.

18 02 54 CMP Okay. Starting step 3 now.

CC-H Okay.

18 03 53 CMP Okay. We have step 3 completed, and Deke says he's completed 4.

CC-H Okay. Stand by a second.

DMP Yeah. And hey, Dick, for your information, the only line I can see is lines 5 and 6. For some reason, the rest of them are all blocked.

CC-H I understand you can see - -

DMP And we're doing it the first - -

CC-H Okay. You can see lines 5 and 6 only?

18 04 22 DMP That's affirmative. I can see a little bit of 4 but 3, 2, and 1 - the ones we usually use for this - none on them are visible. They are all blocked out by some shrouds.

CC-H Roger; copy.

DMP Anyway, it ought to be accurate enough.

CC-H I'm sorry, Apollo. Say again.

DMP Yeah, I think our ... good enough accuracy, I would think, with line 5.

CC-H Roger. Stand by.

18 05 28 ACDR Houston, we're still standing by.

CC-H Roger, Tom. We were talking. Let me get back to you right now. Back on step 3, I probably misled you there. On step 3, we would like to close all the breakers for systems A and B but later in the procedure, when it says actually activating system B, we will not do that. So go back to step 3 and close all the breakers for both systems and also - then we'll be ready to proceed. We do want to terminate the bat Alfa charge, though, before proceeding further in the - with the motors in the procedure. For your information, it's in the Systems Checklist, page 1-6.

DMP Okay.

CC-H And so, let me know when the circuit breaker is IN and the bat - charge is terminated, and we'll press on.

18 06 26 DMP Okay, all 12 circuit breakers are IN.

CC-H Okay.

18 07 01 DMP Okay. The charge is terminated and the BAT RELAY BUS breaker is IN.

CC-H Okay. Super. Press on and start - starting with step 7.

18 07 10 CMP Okay. Starting guide ring extend.

CC-H Okay. We're watching it on the data.

18 07 26 CMP Our PASSIVE light went out.

CC-H Okay.

18 07 53 CMP Okay. We have a GUIDE RING EXTEND light.

CC-H Okay. We see it here on the ground, too, Vance, so you can just continue right on through.

CMP And Deke's working the camera part of 7 now.



CC-H Okay. And just let us know when you - as you continue through, Vance.

CMP Roger.

18 09 07 DMP Okay, Dick. On the camera, I get a 16 foot 11-1/2 inches prior to extension, and I now have 17 10-3/4 on the first reading, 17 11 on the second.

CC-H Okay, Deke. Copy.

CC-H Apollo, Houston. That extension looks good to us, so go ahead and continue.

DMP Roger.

18 10 28 CMP Okay. Starting guide ring retract.

CC-H Okay.

18 11 13 CMP Okay. We have a PASSIVE light on.

CC-H Okay. Same here.

18 11 22 CMP Going to step 8.

CC-H Okay. We're right with you, Vance. Go ahead.

CC-H Okay, Vance, you can go ahead through steps 8 and 9. We're - we think that was a good test and - and we can go ahead and get set up to do the COAS cal procedure that's in - back in the back of the book there.

CMP Okay. Understand. Glad it's a good test, huh?

CC-H That's right. It looked real good. And the next procedure is on page 10-5. Stand by and I'll be right back to you.

18 13 11 CC-H Apollo, Houston. We'd like to go ahead and do this comm check again that's coming right up here over the Russian site. In order to do it, there are two - there is one circuit breaker and a switch that needs to be thrown. The circuit breaker - and they're listed - I'll tell you what, they're listed in the Flight Plan at 28 hours and 20 minutes. The circuit breaker's on panel 815 and the switch is on - on the audio panel of whoever's going to do the comm check is just VHF, FM to T/R.

ACDR Dick, what time do you want to do this FM check?

18 14 09 CC-H We're coming AOS at Eupatoria right now, so if you can throw those two switches - if it's convenient now, we can do it now. If it's not, we can catch it another rev.

ACDR Okay.

CMP Deke's on his way up right now.

CC-H Okay. Super. Let me know when - when you're configured, and we'll go ahead and do the check.

ACDR Okay.

CC-H And also, at your convenience, we'd like to get the bat Alfa charge going again, since we've done the docking system check - check.

ACDR Okay.

18 15 51 DMP And, Houston, your bat charge is started on A.

18 15 54 ACDR Okay, Houston. We have the FM CLOSED. We're ready to do the comm check.

CC-H Okay. Stand by just a second. Let me give you a call on the right loop. Hang on.

ACDR Roger, Dick. Read you loud and clear through there.

18 16 22 ACDR All righty. You're coming through very - you're coming through as good as VHF or S-band.

ACDR Roger. Read you loud and clear. I'll give you one: 1, 2, 3, 4, 5. Over.

ACDR Roger.

18 17 00 ACDR And, Dick, after we complete this comm check, do you want that circuit breaker OPEN?

ACDR Roger, Bob. Roger. Read you loud and clear. How me?

ACDR (I hear you excellently.)

ACDR (...)

ACDR All right. Thank you, now.

ACDR Okay, Dick. We had a good comm check with Bob.

CC-H Okay, Tom. I'm back on S-band now. I concur. And we want you to leave the circuit breaker on panel 815 CLOSED.

DMP Okay. Hey, Dick, while I'm here, you want those systems voltmeter readings?

CC-H Yeah, go ahead.

18 18 17 DMP Okay. System A, number 1 latch, 1.05; number 3 is 1.2; number 5 is 1.8; number 7 is 0.85. On system B, number 2 is 1.5; 4 is 0.8; 6 is 1.0; and 8 is 1.2.

CC-H Okay, Deke. Copy. Thank you much.

DMP And the question on the furnace, I think you got our call that the shroud door will not lock shut. It's open about an inch or 2.

CC-H Which shroud door - -

DMP In checking it, we - -

CC-H Which shroud door was that, Deke? I'm sorry - I don't understand.

DMP That's on the furnace - -

CC-H Oh, okay.

DMP - - on the multipurpose furnace.

CC-H Okay.

18 19 19 CC-H And stand by just a second, please.

END OF TAPE

Day 197

ASTP-AIR-TO-GROUND VOICE TRANSCRIPTION

18 20 26 CC-H Apollo, Houston. What we'd like to do now is go ahead on page 10-5 and start the COAS cal procedure.

ACDR Stand by.

CC-H Okay.

18 21 38 ACDR Okay. Houston, Apollo.

CC-H Go ahead, Tom.

ACDR You want me on - on 10-5 in the UV absorption - do you want to go ahead and do a VERB 49 and maneuver to that - to 225, 145, and 1 - and 348?

CC-H Roger. We think that's where you are now, Tom.

18 28 15 CC-H Apollo, Houston.

CMP Go ahead.

CC-H Hey, Vance, I assume that y'all are pressing through the COAS cal procedure. It looks like in the - getting back to the primary evaporator, we think we may have dried - dried out the evaporator. We need - if someone is free, we can start this procedure now; if not, as soon as the COAS cal is done. What we'd like is to make sure that the back pressure valve is closed and then do a primary evaporator reservice procedure, which is on page 1-18 of the Systems Checklist, with the exception of: delete the last step in the procedure.

18 29 01 CMP Okay; understand. Make sure the door's closed and do the evap reservicing procedure except for the last step.

CC-H Yes. There won't be a problem with the doors. You're right about the doors being closed, but there shouldn't be a problem because there's a 15-minute waiting period in this reservicing procedure. And we should be through with the cal by that time.

CMP Okay. And we're right - the cal's going pretty well. Deke's defining the limits right now.

CC-H Okay. When you get to the - to the end of the cal procedure, give me a holler, okay?

18 29 36 CMP Roger.

18 36 41 CC-H Apollo, Houston.

CMP Go ahead, Houston.

CC-H Vance, we're talking about this afternoon's activities and what can be pushed around or skipped without much impact to the mission, if need be. I'm assuming all three of you guys removed your OBS harness last evening. Is that a fact?

CMP Correct.

CC-H Okay. How's the cal coming?

CMP We're just finishing it up. We're on the last step, 7; cleaning everything up. And I think it was a good cal. Deke - Stand by.

18 37 32 CMP Deke points out that 3-1/2 - 3 degrees to the right and 2-1/2 degrees to the left of the center of the COAS, he was still getting a good signal, which is a little strange since the limits aren't supposed to be that wide.

CC-H Okay. Copy. Vance, while I'm - while I'm talking to you about this, after you get through with the COAS cal procedure, if you'll look on the Flight Plan at - it's listed in there at 29 plus 55. There's a series of about four steps there that'll shut down the UVA lamps and power and so forth. It's called - I think it's probably also in that procedure, but we want you to be sure and do those steps when you're through.

CMP Okay. Understand.

CC-H Okay; I'm sorry. They're - they're not in a procedure, but since - where the Flight Plan's a little bit off, just when you get through with the cal, just do those steps there. And let us know.

Day 197

. CMP Okay. Say the time again.

CC-H 29 plus 55.

CMP 29; okay, thank you.

18 38 44 CC-H Okay.

18 47 34 CC-H Apollo, Houston.

CMP Go ahead.

CC-H Roger. We're about 2 minutes to LOS, and we will not be seeing you again until you get up toward stateside. What - as far as the Flight Plan goes, here's what we'd recommend that you do. First of all, go ahead if you haven't already started and get a bite to eat. And - there's - it is not clear whether or not we're going to have to do this maneuver this afternoon, so we can't be sure about the rest of the Flight Plan. But what we'd suggest is, delete the mapping pass, remain in your present attitude. I've got high-gain angles for you. Don't worry about the SIM bay activation. We will probably be able to pick it up later on this afternoon.

18 48 26 DMP Yeah, well, of course, the next thing the two of us have got is donning the OBS and the exercise, which we haven't started either one of them, obviously. Are you saying you want us to continue with that?

CC-H Negative. What we'd like you to do is, for right now, forget the OBS and exercise. We - it may very well be - delete them, and just go ahead and get a bite to eat, and we'll be squared away when we get AOS as to what to do. We'll know a little more about the maneuver at the time.

DMP Okay.

CC-H Okay. Let me give you some high-gain angles, please. The pitch is minus 39 - 39; yaw, 121 degrees. And those are good for you - -

DMP Pitch is minus 3 - -

CC-H I'm sorry, Deke; go ahead.

DMP Minus 39 and 121.

CC-H That's right, and that's for your present attitude. And we'll see you at MILA at 31:04.

CMP Okay, I take it you don't want me to do the SM experiment activation unless ... coverage.

CC-H That's affirmative. We want to go ahead and get you - just let you guys get squared away and get a bite to eat.

CMP Okay.

18 49 40 CC-H We'll probably pick it up later, Vance.

19 26 43 CC-H Apollo, Houston through MILA. How do you read?

DMP Yeah, go ahead, Bo.

CC-H This is Richard here, Deke. Let me - I assume that you guys are in an eat period. If you can - one thing, we wanted to know what you were doing, naturally. And another thing, I wanted to talk to you about the upcoming burn and our choices on the trajectory. Over.

DMP I think we're right over the Cape.

CC-H You're right. You're passing right over the launch site just about now.

DMP Yeah, we can see it. We're in a good attitude here for Earth obs. Okay, in answer to your question, we're just sort of wrapping up lunch for probably another 10 minutes or so.

CC-H Okay. Let me tell you our thoughts on the trajectory and the burn this afternoon and what we propose for the Flight Plan if you can listen. Over.

DMP Okay. Go ahead.

19 27 49 CC-H Okay. We have a very small out-of-plane component in the trajectories. It's in the neighborhood of 7 feet per second. However, it - the node is placed in such a way that if we don't get it out, it will affect the NC2 and NSR burns tomorrow. Essentially, the

gimbal angle would be about 40 or 45 degrees, something like that. And it'll about double the size of the two burns. This is - we got plenty of gas and so this is - be no problem, but one other consideration is - is that the trajectories ... - the perigee caused by the NC2 burn, if the tracking data went the wrong way during the evening, could conceivably give us an NC2 burn that we couldn't execute because of the perigee. So we're essentially faced with the choice of doing the PCM burn this afternoon, the whole thing, and getting the rendezvous squared away per nominal for tomorrow or doing a small retrograde burn and try to catch up on some of the Flight Plan items. I think what we're leaning towards right now is to go ahead and do the - do the burn this afternoon, which is going to come up here in just a short while, and then essentially for the time being, forget those items that are listed in the Flight Plan until we tell you different, that occurred prior to this time of day. This way we'll be set up perfectly for the rendezvous tomorrow, and then you can jump right back into the printed Flight Plan for the rest of the afternoon with what minor changes we might have to make. Over.

- 19 29 32 DMP That sounds like a brilliant idea. We're all for that.
- 19 29 35 CC-H Okay. Assuming that's what we're going to do, we want to get one thing done and that is, at about 30 hours and 40 minutes in the time line under the AC column, it says, "Go BMAG POWER 1 to WARMUP and verify FDAI scale in 5/1." We don't know whether you have done that or not, but if you haven't, please do it now.
- 19 29 57 ACDR I've already got it on time. That was done on time.
- CC-H Okay. Good, Tom. One other comment; we'd like to continue with the bat Alfa charge until we let you know, and we'll delay the bat Bravo charge until later on today.
- ACDR Okay.
- ACDR Could you give us a ballpark idea of when we're going to plan - the plane change? Over.



CC-H Okay, Tom. I think it's going to be almost the nominal time, but let me see if we have a T<sub>ig</sub> yet.  
Hang on.

ACDR All right.

19 31 34 CC-H Tom, excuse me, I was wrong. The T<sub>ig</sub> time is going to be very close to 32 hours, and that's about 50 minutes from now. And FIDO's hustling to get you a pad at this moment.

ACDR Okay.

CC-H Okay.

ACDR Okay. And, Dick, I was off the headset eating there. We're going to take this mostly out in - with respect to out-of-plane?

CC-H That's affirm. We're going to do it. Right. We're going to get you a pad that's going to take care of the out-of-plane this afternoon, and it'll set up the rendezvous for tomorrow.

ACDR Right. I - I understood the last part of that, but it looks like we'll be getting a P38 then. Over.

19 32 23 CC-H Oh. Tom, I'm sorry. I should have gotten to you. It's going to - it's - it's not going to be a P38. It's probably just going to be an RCS burn.

ACDR Oh, okay. ... we're going to use the big engine for a big delta-V. I didn't know the magnitude of it. Over.

CC-H Oh, no. Yeah, I guess - I guess you didn't hear me. The magnitude is very small. It's really - the magnitude of it we really could easily hide in the burns tomorrow but two or three other considerations just make us think that that is not the smart thing to do. We'd like to just go ahead and get it out.

ACDR Roger. Understand.

19 32 57 CC-H Okay.

19 34 05 CC-H Apollo, Houston. We're about to go LOS from MILA. When you get locked up on the ATS right here, we'll pick you back up.

ACDR Understand.

19 42 18 CC-H Apollo, Houston through Madrid.

ACDR Loud and clear.

CC-H Roger, Tom. Have you been trying to lock up the ATS?

ACDR Roger.

CC-H Okay. Let us recheck the angles again here. We want to get you locked up and switch over to ATS so we can get you a good pad in a little bit. Hang on.

ACDR Okay.

ACDR Go ahead with your angles.

CC-H Apollo, Houston. Say again.

ACDR Roger. What do you have for your angles there?

CC-H We're rechecking them right now. Hang on just a second, please.

19 43 21 CC-H Tom, Houston. The - the correct angles are pitch of minus 7; yaw of 313. Why don't you try those real quick, and - and let's see if we can get locked up on ATS.

ACDR Okay, we got - should have ATS now.

19 44 01 CC-H Okay. I'm reading you loud and clear. That's real good. And stand by 1 on the pad. Hang on.

19 44 46 CC-H Apollo, Houston. I've got a preliminary PCM pad for you when you are ready to copy.

ACDR Okay. Stand by 1 second.

CC-H Okay, Tom. It's - it's in the Flight Plan, page 4.1-16 Bravo.

ACDR And I'm ready to copy.

CC-H Okay. Starting with NOUN 30 - 33. 031:58 four balls; minus 002.2, minus 006.3, minus 006.0; 293, 057, 313;

009.0; 00:24. Weight, 32361; and, of course, the trims are - are not applicable. It'll be a four-jet plus-X RCS burn. And here's the - what the DAP needs to be: 61102. Go ahead.

19 47 13 CC-H And, Tom, Houston. We are processing data from the last good tracking pass we had over MILA. It was a real high pass, so I may have another final pad for you here in about 5 minutes. And I'm standing by to copy. Readback any time you have a chance.

19 48 13 CC-H Apollo, Houston. How do you read?

19 48 45 CC-H Apollo, Houston. How do you read?

ACDR Houston, Apollo. How do you read now?

CC-H Roger, Tom. I read you loud and clear now. How me?

ACDR Okay. Loud and clear. Our - I'll go over them - I'll read them again to you if you're ready to copy it.

CC-H Okay. I don't know what happened there. I called you a couple of times, but I didn't hear you coming down. But I am ready to copy. Go ahead.

ACDR Okay. 031:58 all balls; minus 002.2, minus 006.3, minus 006.0; 293, 057, 313; 009.0; 00:24. Weight, 32361. NA for the pitch and the yaw trim, four-jet plus-X RSC. The DAP load is 61102.

CC-H Roger. That's a good readback, Tom. I don't know if you copied or not, but we probably will have a final pad here in just a minute, based on process of data from MILA.

19 49 48 ACDR Roger. I understand.

END OF TAPE

Day 197

ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

19 50 03   ACDR    Yeah, we could see pad A and B real clear as we passed over.

          CC-H    Yeah, it sounded like that from what Deke said. Apollo, Houston. It turns out the preliminary PCM pad that you read back is GO for the final pad, and there is no requirement for - for you to do the PC - excuse me, the P52 prior to the burn, and we see that the DAP is loaded okay.

          ACDR    All right. Real good. Thank you.

          CC-H    Okay. And we're standing by.

          ACDR    Roger. No P52 required and we'll do a four-jet ullage on it - four-jet burn.

          CC-H    Roger. That's correct.

          ACDR    And Houston, to keep comm as long as you can, when do you want us to maneuver to the burn attitude?

          CC-H    Okay, Tom. Hang on and let us check the angles and I'll get back to you.

19 52 52   CC-H    Apollo, Houston. Tom, it's okay with us, so you can maneuver whenever you'd like to - just to give you plenty of time, it does look like we probably will lose the high gain shortly before you get to the burn attitude, so why don't you just let us know when you are starting the maneuver. Be advised you probably will see a high gimbal angle when you do the maneuver, but that shouldn't be any problem, as long as you're aware of it. I wanted to point out one thing before I lose you, though, about the Flight Plan, and that is the mapping - the Earth resources mapping pad that we were forced to miss awhile ago - that camera setup in the window was intended to be used or - we were going to leave the camera setup in the window and so sometime if you have a free moment before the next mapping pass, which for sure we don't want to miss, you might want to start that camera setup a little bit early. Over.

19 53 46 ACDR Yeah, the camera setup is right - it's going on right now.

CC-H Okay. You're ahead of us. Thanks a lot and just let us know when you start maneuvering, Tom.

ACDR All righty.

19 54 04 ACDR Okay. We're going in and take the maneuver right now.

CC-H Okay, Tom. See you later. The - the next AOS after the burn will be Vanguard at 32:14.

ACDR Roger.

19 55 50 CC-H Apollo, Houston. I think I was confused a little bit about the high-gain angles awhile ago. The situation is that we probably will keep comm for a while in the burn attitude, but towards the end of the ATS pass, we will lose comm, so will not be able to watch you burn. In the event we lose high gain while you are maneuvering, I do have a set of pitch and yaw high-gain angles. When you get to that attitude, you might - could reacquire.

ACDR All right, go ahead.

CC-H Okay. Pitch of minus 35, yaw of 094.

ACDR Roger. Pitch of minus 35, yaw of 094.

19 56 32 CC-H Okay. Real fine. See you later.

20 09 45 CC-H Apollo, Houston through the satellite.

20 11 20 CC-H Apollo, Houston. How do you read?

20 14 16 CC-H Apollo, Houston. How do you read?

20 15 13 CC-H Apollo, Houston. How do you read?

20 15 25 CC-H Apollo, Houston in the blind. Tom, if you are reading me, we notice that the BMAG POWER 1 is not ON, and because we're looking at low bit rate, we're not - we're unable to look at the RCS jets, but they should all be enabled also.

Day 197

20 34 31 ACDR Hello, Houston; Apollo.  
CC-H Roger, Tom; go ahead.  
ACDR All righty. Couldn't get you on DATA REACQUIRE;  
went on to comm attitude and the burn went right  
on time. Everything was good. The residuals were  
zero, plus 10, and delta- $V_C$  - -  
CC-H Okay.  
ACDR And delta- $V_C$  ...  
CC-H I'm sorry. I didn't copy delta- $V_C$ . Say again, please.  
ACDR ...  
CC-H Okay. Sounds real good, Tom. We're - if you'll  
stand by here for a second, we're talking about the  
rest of this afternoon's Flight Plan, and I'll  
get right back to you.  
ACDR Okay. We're trying to leap in and try and get  
ahead of the game and we're - I've already finished  
my leg volume measurements and Vance is working on  
Deke, and I'm going to get going on the electrophoresis.  
MCC-H Okay. Press on with the leg volume measurements.  
Let's go ahead and do that.  
CC-H Okay. We do want you to press on with the leg  
volume measurements. We may have some changes after  
that, and we're talking about it now, and I'll  
get back with our recommendation here as soon as  
I know it, Tom.  
ACDR Okay. You want me to plan to go ahead with that  
electrophoresis prep then on time? Because if we  
do some maneuvers, that changes that.  
CC-H I can't answer it right now, but I think I'll  
have an answer here before LOS, so I'll be right  
back to you.  
20 37 26 ACDR Houston. Houston, Apollo.  
CC-H Go ahead, Tom.

ACDR        Okay. Ask the experimenters on the furnace if there's any concern about having that furnace running with the door open.

CC-H        Roger. We got that report awhile ago, and we are in the process of working it, and I should have you an answer shortly.

ACDR        All right. Thank you.

CC-H        And, Tom, if you're still there, can I talk to you a minute about the Flight Plan this afternoon?

ACDR        Sure can. I've got it right in front of me.

CC-H        Okay.

CMP         And, Dick, tell them that the furnace is running so whatever they come up with may not matter, because we have it going.

20 38 08    CC-H        Okay. Thanks, Vance, and I will. Okay. The - it turns out that we've looked at all the things in the morning that needed to be done and prioritized them against the things this afternoon, and the thing that we want to make up is to make sure that we get an OBS and exercise run sometime this afternoon on the three crewmen. What we'd recommend is the following: You're obviously ahead and already started on the furnace and the leg volume so we'll complete that and, also, we'd like to start the EPE prep on time and then when CP and DP finish up on the leg volumes, if they'll start putting on the OBS and can get that exercise out of the way. We think that the AC may be able to do his during the long EPE ops from about 33:10 down to 34:30, and it isn't clear exactly what, in the remainder of the afternoon, we'll have to cancel because, frankly, we just don't know how fast the OBS donning and exercises will go.

20 39 20    ACDR        Are you talking about **canceling** the Earth obs and the mapping for OBS ... ?

CC-H        We're talking about it, but it isn't clear at this moment that we have to do it.

ACDR        All right. All right.

CC-H But - but, Tom, to answer your question directly, yes, we are. We do consider the OBS donning and exercising more important and we would cancel it if we had to.

CC-H And, Apollo, Houston. I'm going LOS here, and we'll give you a call at Rosman at 32:39. See you there.

20 39 58 ACDR All right.

21 03 14 CC-H Apollo, Houston. Newfoundland through - on VHF. How do you read?

21 04 30 CC-H Apollo, Houston. Through Newfoundland. How do you read?

ACDR ... and then they'll try to get on the - one of the biosensors, and I'm starting ahead on the electrophoresis.

CC-H Okay, Tom. About the first half of your conversation was way down in the mud, and I didn't copy it. I'm sorry. Can you say it again?

ACDR Okay. Deke and Vance are doing the leg measurements, and I'm starting on the electrophoresis, the German one, MA014.

21 05 05 CC-H Okay, Tom.

21 13 05 CC-H Apollo, Houston. I'm not in - I don't want to interrupt what y'all are doing, but when Tom or - anybody that could talk to me about the next 3 or 4 hours of the Flight Plan - could - I'd like to say a couple or three words about it to you. I was cut off short by LOS back there at the Vanguard, and we really didn't finish talking about it.

ACDR Okay, Dick. Let me tell you where we're at now. I just got the EPE prep finished. I'm getting ready to get that started. Vance and Deke are getting on their biosensors. They can either get the - maybe get the thing maybe before or after the mapping pass. Okay, now, you go ahead.



CC-H Okay. That sounds good with what we were planning. What we were going to suggest was the following, Tom. We're hoping to - first of all, we do want to get the OBS and the exercise. We would - -

ACDR That's in work.

CC-H Yes. Okay. Understand. Okay, now we would also go ahead and want to do the P20 option 5 and at least we figure we can get the mapping pass - we're willing to give up the vis obs pass that goes along with it, and I guess you guys would be a much better judge of that than us. Looking ahead to the - -

ACDR ...

21 14 19 CC-H Okay.

ACDR Well, let me tell you - here's what I think we ought to do. Looking at this thing here from the time we got, and what it's going to take them, we're now here at 32:54, coming up to 33 hours. I'll be in good shape for the EPE prep and run that. By the time these guys get the OBS on, it's going to take them 20 minutes to do that; you're going to have LOS. Let us go ahead and go get these OBS on, we'll go do the vis obs, and the mapping pass, and then after that at the next acquisition, you can get those two guys working out. Over.

CC-H Okay, before we make the final decision, Tom, let me tell you what we were going to propose. We missed the SIM bay activation this morning and what we were going to do - we cannot do the raster scan without the SIM bay activation. What we were going to propose to you was to delete the raster scan that takes up that ATS pass coming up over there at about 34 hours and 30 minutes and use that ATS pass and that coinciding night period to get the SIM bay activation that we missed this morning.

ACDR Okay, real good. We can go back and pick up that raster scan.

CC-H Okay, and I guess the complication between that and what you suggested was that we're quite willing to

give up the vis obs in order to do that, but we still wanted to get the mapping done.

21 15 44 ACDR Okay. We may be able to do all this. We'll put the SIM bay activities in there at that time.

CC-H Okay. But we will plan, then, on doing the SIM bay activation instead of the raster scan and - why don't we just let you guys just go ahead and be working and see how it goes from now. But, definitely, we do want to get the mapping pass.

ACDR Okay, good. You can get the biomed data in on your remote - on your recorder.

CC-H Okay. Yes, we can get it either real time on the ATS or any of the STDN passes, like for instance, at Vanguard or Goldstone. If we're LOS, you'll need to go to high bit rate while you're exercising and then - then out of high bit rate when you're through.

ACDR Okay. That's all I need to go to high bit rate, good. Okay. We're going to press right on here. I'm working - everything's going along good on the EPE.

CC-H Okay. Real fine. Keep us advised. We're standing by. We still got almost 40 minutes of this ATS pass, so we're sitting here.

ACDR Okay. I've got - I've already - inhibited all those jets except D1, B2, A3, C3, B3, and D4 on it.

21 16 56 CC-H Okay.

CC-H Apollo, Houston. Be advised we're about to change modes on the satellite. We're going to dump the SC data to clean it off for you for this upcoming exercise period and so I'll drop out for about 30 seconds.

ACDR All right.

21 18 39 CC-H Okay. And I'll call you when I'm back up, Tom.

END OF TAPE

Day 197

ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

21 21 43 CC-H Apollo, Houston. I'm GO for voice again here on the ATS. Standing by.

ACDR Roger, Dick. I'm now starting work on the electrophoresis, and they're getting ready for their bio - their little workout. One thing that nobody ever thought of in the time line is the amount of time it takes to go up and reset the master warning when the O<sub>2</sub> flow goes high.

CC-H (Laughter) I figured that must be bugging you, because we've been noticing every time that it went off, and it sure does seem like a lot.

21 23 33 ACDR Houston, Apollo.

CC-H Roger, Tom. Go ahead.

ACDR Okay. Have you got the EPE checklist there?

CC-H I sure do. Let me turn to page - I've turned off of it. What page are you on?

ACDR Page 1-2.

CC-H Okay. Go ahead.

ACDR Okay. It says, "Perform steps 9, 10, and 11." Okay, I see what to do. I'll go ahead to the freezer and I can get out that little jewel already and leave it out for 20 minutes, okay? Check this experiment with Bob Nute that - -

CC-H Okay.

ACDR - - it says, "Perform steps 9, 10, and 11." That's written in, and it says ... cryo freezer and place near. Get tool E. Do all that good stuff - -

CC-H Yeah, yeah. I see where you are.

ACDR - - and then remove the sample.

CC-H Yeah, I see where you are. Hang on and let me check real quick. I'll be right back to you.

21 25 00 CC-H Apollo, Houston. Tom, yes, you've got it right. After step 2, what we want you to do is go - skip over and perform steps 9, 10, and 11, and after you complete those, go back to step 3, and then proceed right on through.

ACDR Okay. So then just ... the sequence, I'll put in sample 1, 2, and 3 for the run, and I'll pick up the sample 4, which comes out of the freezer as the last one. Right?

CC-H That's affirmative.

ACDR Real good. Thank you.

CC-H Roger.

ACDR Hello, Houston. Apollo.

CC-H Hello, Tom. Go ahead.

ACDR You wouldn't believe what just happened.

CC-H Well, tell me.

21 28 55 ACDR You know I was going after the electrophoresis sample in the freezer? I pulled out the cap, and it came flying out without even having to go after it and took off across the spacecraft at minus 200 degrees. We finally got the little rascal captured, using some used underwear, and we're proceeding on.

CC-H Roger. You're right. I never would've guessed what happened.

CC-H Apollo, Houston. For Tom.

ACDR Go ahead.

CC-H Tom, what do you think the problem was when you got the cap off and the sample came flying out? Was it just the force that you took the cap off, or do you think it was maybe some pressure in there that - that just let it go?

ACDR (Laughter) That's hard to say. There's a few drops of ice and snow, and Vance was helping me,

and the thing came out. And just as we got the lid out and I started to reach down to touch the little - to - you know, extension there to turn it - Bang! The thing just came zipping right out. But it is now well secured and under control.

21 31 13 CC-H Okay. We were - while it was fresh on your mind, we just wanted to hear what we could about it to see if there was something maybe we could prevent in the future.

ACDR Well, it was like a minor snowstorm - just a little bitty one that came out. It wasn't bad.

CC-H Okay.

CC-H Apollo, Houston. For Deke. Deke, when - assuming you're going to do this mapping pass coming up, when you have the time, I've got an update on the time in the Earth Obs Book on mapping pass Mike 3.

CMP Okay, go ahead with your change for Deke's mapping.

21 34 34 CC-H Okay, Vance. The change is - is the stop time for mapping pass M-3. And the correct stop time - the start time is okay, as is the change - all the data for M-2. The stop time for M-3 should read 34:06:40.

CMP Okay. 34:06, and you were cut out on the seconds. Please repeat seconds.

CC-H Roger. That's really the only change. It's 40 seconds. 40.

CMP Roger. Understand.

CC-H Okay, Vance. And, incidentally, one of the things that we never got a report back down on was - was the VTR cooling activation procedure done yet?

CMP Negative. It's not done.

21 35 24 CC-H Okay. At some point, we would like to get it done and get you to tell us. When you do do it, it's on page 1-47 of the Systems Checklist. The reason we're interested in going ahead and doing it is that we had a funny on dumping one of the VTR tapes.

We don't think it's any kind of a failure in the - -  
in the equipment. However, we would like to do a  
little bit of troubleshooting that's not scheduled  
in the Flight Plan now. And we don't want to do  
it until we get that - hoses hooked up.

CMP Okay. I understand - -

CC-H So - -

CMP And Deke and I are both instrumented, and he's  
going to exercise first.

CC-H Okay. Real fine.

21 39 52 CC-H Apollo, Houston. Be advised we're through with  
the DSE dump, and so we've got ATS for the next  
15 minutes - 14 minutes. So, Deke, if - if you're  
getting ready to exercise and can go ahead and  
start doing it, we will not have to use up the  
DSE, and we can just catch you **in real-time** data.

ACDR Okay. How about helping us? Where's the exerciser?

CC-H Okay. Stand by a second.

ACDR ...

CC-H Okay. Hang on a second.

CC-H Tom, it was launched in A-5.

ACDR In A-5. Okay.

CC-H That's affirm.

ACDR **Houston, Apollo.**

CC-H Roger, Tom. Go ahead.

ACDR Be sure your doctors have on their bifocals there.  
Deke's going to start exercising shortly.

CC-H Okay. Super. And we got 9 minutes left in the  
ATS pass.

DMP I'll tell you one thing. You get more damned exercise getting ready to exercise than we're ever going to get doing it.

CC-H (Laughter) Roger. That's the exercise - getting ready.

21 48 54 CC-H Apollo, Houston. Be advised that we do not see any biomed data at all of whether or not Deke has started exercising or not. Have - -

ACDR He's huffing - -

CC-H - - Are you plugged in already?

ACDR - - he's huffing and puffing like mad.

CC-H Okay. Why don't you make sure that he's plugged in there. We don't see any biomed data.

ACDR ... He's plugged in the DM, but that doesn't carry biomed data. We'll have to get it back down here.

CC-H That's affirm. Sorry about that.

ACDR Okay. You better think about this, Dick. The DM's the only cool place. This command module's still pretty hot, and to try exercising down here, I'm not sure how good it's going to go, but the comm cords won't reach from here up to there. We'll take a look at it.

CC-H Okay. Copy. We would like to get at least a little bit of data during - during this exercise period.

ACDR Well, we'll have to come back down in the command module where it's pretty crowded and hot, but we'll see if it'll do.

CC-H Roger, Tom. We still have about 5 minutes left in the ATS pass.

ACDR This isn't quite Skylab.

CC-H Roger. Understand.

DMP Hey, Dick. What do you want down there? Do you want us to get some exercise or do you want some EKG data? I think we ought to give you one or the other.

21 49 46 CC-H Okay, Deke. Why don't you go ahead where you are and finish the exercise? And then when you get through, come back in the command module and plug in for a while, give us some EKG data, and maybe that's the best compromise of the whole thing. We really wanted to do both.

DMP Okay. Well, we'd like to give you both. But I - I think we're going to get neither if we don't do something pretty quick.

CC-H Roger. Understand. I'd suggest going ahead and finish the exercise and then when you get back in the command module, give us some - some biomed data and - -

DMP Okay, we'll do that.

21 50 20 CC-H Okay. And if we've had LOS ATS, just turn on the high bit rate and put it on the DSE and we'll pick it up a little bit later.

DMP Okay.

CMP And, Dick, we are maneuvering to go into P20.

CC-H Okay. Okay, Vance.

21 52 21 CC-H Apollo, Houston. Are you still there? Okay, Apollo, Houston. If you still read, we are going LOS ATS. I'll see you at Vanguard at 33:47.

22 08 00 CC-H Apollo, Houston. Good evening. I have a couple of items that need to be done if somebody has a chance to copy.

ACDR Go ahead, Bo. Glad to see you on duty again.

CC-H Yeah. Glad to talk to you, sir. One is that at 34:07, we need you to perform P00 and then VERB 49 to a solar inertial attitude. You ready to copy?

ACDR Got that.



CC-H Okay.

ACDR 34 plus 07.

CC-H Roger. P00, VERB 49 to roll, 019; pitch, 170; and yaw, 330. And the high-gain angles are pitch, minus 70; and yaw, 050.

22 09 03 ACDR Okay, Bo. At 34:07, VERB 49 to SOLAR INERTIAL; roll, 019; pitch, 170; yaw, 330. High gain is pitch, minus 70; and repeat the yaw, please.

CC-H Yaw was 050.

ACDR 050. Roger. Vance and Deke are right in the middle of the Earth obs mapping, and I'm just finishing the four sample electrophoresis, but we'll get it all done for you.

CC-H Roger. And I have one other item. And at 33:55, we need to end the manual soak and perform the helium injection. That's on Docking Module Checklist, page 7-5.

CMP Okay, Bo. I'm aware of that one.

ACDR At 33 plus 55, manual soak and helium injection, page 7-5.

CC-H Roger.

DMP Are you guys getting biomed data down there?

CC-H Deke, I understand that we do have data. It's poor quality - the data is poor quality.

DMP Okay. ... plugged into the CSM here for this mapping pass.

DMP We'll try to get in some exercising time later.

22 10 52 CC-H Apollo, Houston. There is less than a minute until LOS. We'll see you at Goldstone at 34:03.

DMP 34:03.

22 24 57 CC-H Apollo, Houston through Goldstone for a little over 4 minutes. Standing by.

ACDR Roger. Electrophoresis is finished, and now I'm shutting down the experiment.

CC-H Roger. That's good news and when you have a chance, you call me and I'll give you some Flight Plan changes, sir.

ACDR Okay. Stand by. We're pretty busy right now, but we'll call you in a minute.

CC-H Apollo, Houston. We've been thinking about doing the SM experiment activation at about 34:25. Is that a good time for you people to start?

ACDR Yeah, ... will be over then, and we'll go - ... I'm still getting ... electrophoresis thing.

22 29 03 CC-H Roger. Understand. You're still working on the electrophoresis, but you think we can make it.

CC-H And, Apollo, you can do that deactivation of the primary evaporator on the bottom of page 4.0-18 and the WASTE STOWAGE VENT valve, CLOSED, as soon as you figure - finish the electrophoresis ops. And it needs to be done 10 minutes before we start the experiment activation.

ACDR Okay.

CC-H And we're going to be LOS here, and we'll see you at Madrid at 34:26.

DMP Hey, Bo. You guys want any more ... or are we clear to ... that off?

CC-H Apollo, Houston. Say again, please.

22 29 52 DMP Yeah, did you guys want any more biomed data?

22 36 00 CC-H Apollo, Houston through Newfoundland. How do you read?

ACDR Loud and clear, Bo. We're maneuvering at solar inertial attitude.

CC-H Roger. The last data we had said that perhaps you hadn't gotten to that deactivation of the furnace yet. Have you been able to get to it, sir?

CC-H And, Apollo, Houston. We're standing by for ATS acquisition.

CC-H Apollo, Houston through ATS. How do you read?

ACDR Loud and clear. We're deactivating the primary evaporator.

CC-H Roger. We copy. And before you start the SM experiment activation, will you give us a couple of minutes warning so that we can get the ground configured to receive your data.

22 38 37 ACDR Okay. Then you want the SM activation to take place in the solar inertial attitude that you gave us of a 19 roll, 170 pitch, and 330 yaw. Over.

CC-H Roger. That is correct.

ACDR Okay, Bo. We're ... there now.

CC-H And, of course, since you're going to be doing that activation from 34:30 to 35 hours, all of the other activities in the AC's and CP's columns of the Flight Plan are going to be deleted.

ACDR Yes.

DMP Bo, how do you read?

CC-H Read you loud and clear, Deke.

DMP Okay, I guess you guys wanted to know what our ... temp is. It's 691.

CC-H 691

DMP Roger.

CC-H And, Deke, we've got plenty of data off of your exercise.

DMP Okay, I'll go ahead and finish exercising anyway. I've still got the biomed on, however.

CC-H Okay.

22 40 55 CC-H And, Tom, we still show that the secondary coolant loop is working. Have you turned it off?

ACDR        Okay, I thought they told us yesterday because it's still rather warm in here, they're going to leave just the pump on.

CC-H        Negative. We decided to turn the whole thing - turn it off, and we think we'll probably do better with it off.

ACDR        Okay, Bo. The pump is off. Everything else I had off but the pump.

CC-H        Okay, and the SECONDARY LOOP EVAPORATOR has to be OFF, too.

22 41 41    ACDR        Roger. I had it to RESET for a minute, then back OFF. I'll do it again.

ACDR        Houston, Apollo. How do you read?

CC-H        Loud and clear. Go ahead.

CMP        Okay, Bo. When - if you're ready, we're ready to start on step 3, SM experiment activation, 1-13.

CC-H        Roger. If you'll hold off for a minute or 2, we'll give you a call when we have the ground configured for your data.

CMP        Okay.

22 46 44    CC-H        Apollo, Houston. Our data system is configured. We'd like to confirm that the WASTE STOWAGE VENT valve is CLOSED, and then you're clear to proceed with the SM experiment activation.

22 47 15    CMP        Okay, Bo. WASTE STOWAGE VENT is CLOSED now and - as is - I just closed the battery and the OVERBOARD DRAIN DUMP, also. Ready to go.

CC-H        Roger. Go ahead.

22 47 34    CMP        Okay. This time CB HELIUM GLOW MAIN B coming CLOSED, from there.

CMP        Step 3 complete.

CC-H        Copy.

Day 197

TAG Tape 197-13/T-17  
Page 11

CMP Step 4 completed.

CC-H Roger.

22 48 38 CMP And we have gray on all covers in the CLOSE position.

CC-H Understand.

CMP Okay, the TIE-DOWN RELEASE is released, and I'll give you voice marks opening various covers.

CC-H Roger. We're copying.

22 49 34 CMP X-RAY COVER, OPEN now.

CC-H Roger.

22 49 50 ACDR HELIUM GLOW COVER, OPEN now, too.

CC-H Roger.

END OF TAPE

## ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

22 49 57 CC-H And, Apollo, Houston. We'd like you to stand by here for just a minute.

CC-H And, Apollo, Houston. We'd like you to verify one more time that the primary evaporator has been deactivated.

ACDR Well, stand by and let me check again. WATER is OFF and it's manually up. ... FLOW is off, and WATER's MANUAL.

CMP Okay. That's verified, and we very carefully did that, and held the door switch closed to - to close the door for 1 minute.

22 50 56 CC-H Roger; good. You're clear to proceed.

CMP Okay.

22 51 07 CMP EUV COVER, OPEN now.

CC-H Roger.

22 52 21 CMP Okay, we've completed step 4. We're waiting 5 minutes.

CC-H Roger. We'll give you a call at 4 minutes.

22 52 38 CC-H And, Apollo, Houston. We'd like BATTERY VENT back to VENT.

22 52 45 CMP Roger. Back to VENT.

22 53 57 ACDR Bo, while we're waiting for some of these items - it takes a while, do you still want us to get these DM height measurements? Over. At 35 hours?

CC-H That's negative. We do not want you to perform those.

ACDR Okay. We'll still go ahead and - you still want to skip the exercise period for Vance and myself, right?

CC-H Roger. We still do want you to do the exercise.

22 54 34 CC-H And, Apollo, Houston. We have a question. On that LiOH changeout at 34:30, if you did not change both of them out this morning, change - if you did not change one this morning, change both now. And did you change one this morning?

CMP That's affirm. We changed one this morning per plan.

CC-H Thank you.

22 55 59 CC-H Apollo, Houston. Thus far the data off of the experiment you've activated looks just great.

CMP Glad to hear it.

CC-H So are we.

CC-H It's 4 minutes now.

22 57 25 CC-H And it's 5 minutes.

CMP Okay. Understand we're - we can proceed with 5.

CC-H Roger; proceed.

22 57 40 CMP Starting - starting the UV TELESCOPE POWER switch OFF.

CC-H Copy.

CMP EUV COVER, OFF now, CLOSED now.

CC-H Copy.

CMP HELIUM GLOW COVER, CLOSED now.

CC-H We show it CLOSED.

CMP Starting X-RAY PURGE.

22 58 45 CC-H Roger.

22 58 53 CMP And the BACKUP PURGE talkback is gray, as it should be.

CC-H Roger. And we'll give you a call at 14 and 15 minutes.

CMP Roger.

22 59 36 CC-H And, Apollo, Houston. On the top of page 4.1-19 of the Flight Plan, everything was deleted because of this experiment activation, except for the activation of the PRIMARY EVAPORATOR and the WASTE STOWAGE VENT valve to VENT, which is down under the DP column. And - -

ACDR Okay, Bo, we got it, and we'll take care of that when we're finished here.

CC-H Roger. That's exactly right; after you're finished.

ACDR Okay; Roger.

23 00 09 ACDR And while we're waiting here, you can pass on the - again on the MA014, the German electrophoresis, the thing just worked as prescribed, and everything looked like it was good.

CC-H Thank you.

CMP Might add that just before starting this experiment activation, I had a visual obs pass over a lot of the Pacific and some of the U.S., as you know. I would say it was a partial success. We had quite a bit of cloud cover, for example, completely over New Zealand. We were hoping to look at a fault zone there and look for some stuff on the water, which was - then - there wasn't much to see around New Zealand, but at Los Angeles, the water just offshore was cloudy but it was very clear inland over the desert and so forth.

CC-H Roger; copy.

23 01 25 CC-H And, DP, Houston. Could you tell us the status of the MA014 helium injection?

DMP Okay, Bo. Yeah, it's all done. I'm up here exercising right now.

CC-H Roger. Understand it's completed.

DMP Rog.



CMP And, Bo, after we finish this, I'll get my exercise. Are they getting my biomed down there?

CC-H Let me check, Vance.

23 02 24 DMP And, Bo, while you're asking the medics questions, I got another one.

CC-H Go ahead.

DMP Yeah, I checked my pulse rate, you know, before I started exercise. I'm running like 48 to 52, somewhere in there. And I've been working up here for, oh, maybe 10 minutes and about as hard as I could do in one-g. And I could only get it up to, you know, around 70 to 75. So I'm not sure exercise was all that significant. They might want to review whether they really needed exercising or not.

23 02 59 CC-H Roger. We'd like the exercise, and I understand 48, 52 before exercise and 70 to 75 now.

23 03 07 DMP Yeah. That's not much of a rise.

23 05 33 CC-H Vance, Houston. We don't see any data on you down here now.

CMP Okay, just a second, I'll check my SUIT POWER switch.

CC-H Roger.

CMP Panel 10 appears to be hooked up okay, Bo. And I'm on the umbilical for the center couch.

CC-H Understand.

23 06 30 CMP Okay, check again. There was one thing not connected.

CC-H Roger; we're checking.

CC-H Vance, thanks. We're getting data now.

CMP Very good.

23 06 57 CC-H Apollo, Houston. Now we understand that the data is very clean. This is the data on Vance.

CMP Glad to hear the heart's still pumping there.

23 09 28 CC-H Apollo, Houston. Our data so - shows some problem with the furnace, and we would like you to redo the helium injection that was performed earlier.

CMP Okay, Dick, we got that. You go ahead.

ACDR Okay, Deke said he did it twice which is what the plan calls for. Over.

CC-H Roger. Understand. Deke did it twice.

ACDR Yeah, it's in the procedure.

CC-H Roger. I know he said he completed the procedure. Let me check with Experiments once again.

ACDR All right.

23 10 22 CC-H Apollo, Houston. Experiments say they still would like it done again. They're having some problem here and they'd like that helium injection performed another time.

ACDR All right. That was - was that a total sequence of two shots or just one shot?

CC-H Checking.

ACDR Was that two injections or one injection?

CC-H We would like the two injections, Apollo.

ACDR Okay, in work, and Deke's going back there.

CC-H Roger.

CC-H And, Apollo, Houston. Our wait period has been adequate and you can continue on page 1-15 of the experiment activation.

CMP Okay, we're starting now.

CC-H And, Vance, the doctors are happy with the data they've seen from you, and you can let the commander hook up to the OBS.

CMP Okay. That means that I can take my OBS off now or - or would you still like to see exercise?

CC-H Roger. You can take yours off and - we've had enough data from you, and it looks like you put the pasters on just right and we got good data.

CMP Very good. Thank you.

CC-H Apollo, Houston. The X-ray looks good.

23 13 22 CMP Okay, Bo, we just completed an X-ray purge cal and held it for about 30 seconds. We'll close the door now.

CC-H Roger.

23 13 34 DMP Okay, Bo. I've injected helium two more times. Want anything else done with it?

CC-H Roger, Deke. Read you, and I'm checking with Experiments.

DMP Okay.

CC-H Thanks, Deke. Experiments doesn't want anything now and we'll watch it for a while.

DMP Okay.

23 16 55 ACDR Okay Bo. You should have biomed on me.

CC-H Roger. I'll check with the Surgeons.

23 17 09 CC-H We're getting good data on you, too, Tom.

23 17 21 ACDR All right.

CMP Houston, Apollo. The SM experiment activation is complete.

CC-H Roger. Understand. And you're clear to enable all the thrusters except the A/C ROLL, of course, after the completion here and the covers are closed.

23 17 43 CMP Okay, covers are closed and after what else?

CC-H And, of course, you're also cleared to do that activation of the primary evaporator and WASTE STOWAGE VENT valve as shown for the DP down at about 35.

Day 197

CMP Okay, will do. Thank you.

23 18 44 CC-H And, Apollo, Houston. For your information, 100 percent on that experiment activation. Everything looks exactly normal.

CMP Well, we'll sure try to bring you back some good data in a few days, then.

CC-H Roger.

23 19 43 ACDR Okay, Bo. As far as looking ahead to the Flight Plan now that we've finished that - Okay, we're going to activate the primary evaporator now ... WASTE STOWAGE VENT.

CC-H Roger, sir. And after your exercise, I guess we'd just like you to settle down and eat, and get ready for the presleep checklist.

ACDR All right. Yeah, what was supposed to be a relaxed day turned out rather busy.

CC-H We all agree.

23 20 25 ACDR One thing, Bo. When you look at this whole sequence, this thing is so small and so loaded compared to say a very similar thing in Skylab, or even some of the other command modules. When one person's in a certain area, he just can't do - he can't do anything in parallels; you got to be in series on a lot of it.

CC-H Understand.

ACDR Okay, Bo. And one last thing before we lose you on ATS. You want us to go ahead and maneuver to our solar inertial sleep attitude when we go over the hill?

CC-H That's the attitude that you're now in.

ACDR Oh. All righty. Well, I'm checking up on the angles here.

23 21 54 CC-H Apollo, Houston. We did miss one little item there. And that's under the CP, where it says enable all jets and configure the DAP. That will then get you in the proper sleep configuration. You're already in the proper attitude.

ACDR All right, we'll take care of that.

23 23 38 ACDR And Bo, one last thing here - we still in contact?

23 23 42 CC-H Roger. We're still in contact. We've got about 2 minutes.

ACDR Okay. It's got outlined in red there; it said, "Configure DSE LOW BIT RATE, RECORD FORWARD, COMMAND in RESET." So you want that done? It's at about, on the Flight Plan, 34:54.

CC-H Negative. That went with the raster scan and it's not required.

23 24 04 CC-H And, Tom, you're completed. We've got enough data on you, and you can unplug your OBS if you wish, but continue with your exercise.

ACDR All right.

CC-H Apollo, Houston. There's about a minute until LOS, and we'll see you at Orroral at 35:08 for a couple of minutes.

23 25 14 ACDR Roger.

23 29 41 CC-H Apollo, Houston through Orroral Valley for 2 minutes.

ACDR Roger, Bo. One item ... mention about the VTR coolant activation. Do we still want that as far as putting that ... hoses on there?

CC-H Roger, Apollo. We would like that VTR coolant activation.

CC-H Apollo, Houston. There is 1 minute until LOS. Next AOS will be Hawaii at 35:26.

ACDR Roger.

ACDR Houston, Apollo.

CC-H Apollo, Houston. Go ahead.

ACDR Okay, Bo. One question. You know these little ... dosimeters that we had - on our underwear - what do you want done with those, because we also have the big personal dosimeters with counters on them. Do you want these brought back?

Day 197

23 32 46 CC-H I'll check.

23 46 52 CC-H Apollo, Houston through Hawaii for 5 minutes.

ACDR Roger, Bo. How do you read? Okay?

CC-H Roger. Read you okay. We have one item that has to be done and that is at 36 hours we would like to terminate BAT A charge and initiate BAT B charge.

ACDR Okay.

CC-H And I've got a question for you. Would you like us to get some news together here for your dinner period, when we get into ATS coverage?

ACDR Hey, that would be great.

CC-H And have you people started to eat yet?

ACDR No. We're just preparing. Vance and Deke are preparing, and I'm taking exercise. Over.

CC-H Understand.

CC-H Apollo, Houston, there is a minute to LOS. Next is Goldstone at 35:37.

23 51 41 ACDR Okay, Bo. Real fine.

23 57 54 CC-H Apollo, Houston through Goldstone for about 2 minutes; standing by.

CC-H Apollo, Houston. There is 1 minute until Goldstone LOS. ATS LOS is next at 35:48.

23 59 23 ACDR How do you read, Bo?

CC-H Read you, Tom. Go ahead.

ACDR Oh. Okay. We're just changing headsets and working on food around here.

CC-H Okay. We don't have anything for you on this pass.

23 59 33 ACDR All right.

00 11 01 CC-H Apollo, Houston through ATS. Will you go ACCEPT, please, for us?

00 11 10 ACDR You've got ACCEPT, Bo.

CC-H Roger. And we have some - evening news here if you people are ready for that. Are you eating yet?

ACDR Stand by just 1 minute, and we'll get you on the squawk box.

CC-H Okay; well, when you're ready, just call us.

ACDR Okay, Bo. Go ahead.

00 12 19 CC-H Roger. As you might have guessed, dominating the news wires yesterday and today are stories about the successful launches of the Soyuz and Apollo spacecraft. Yesterday morning, President Ford and Soviet Ambassador Dobrynin watched and applauded the Soyuz launch at the State Department auditorium. President Ford said the launch marks the beginning of a very epic adventure into space and was blazing a brand new trail. Dobrynin traveled to Florida with NASA Administrator James C. Fletcher to view the launch. President Ford watched the launch at the White House on television and was briefed by former astronaut Harrison Schmidt, who is now assistant administrator for NASA Office of Energy Programs.

CC-H Second article is - Washington - The output of the nation's factories, mines, and utilities rose in June for the first time since last September, providing further evidence that the deepest recession since World War II may be ending. The Federal Reserve Board reported Tuesday that industrial production rose 0.4 of a percent in June. Output of consumer goods (including automobiles and household appliances) rose, offsetting declines in business equipment and many materials, such as steel, that businesses use in manufacturing. The reason is that, although production of consumer products has been increasing at a rate fast enough to end the decline in output and produce real growth, a revival of the consumer sector by itself is not sufficient to induce a strong recovery. One government

economist said, "The consumer sector is leading the way. A little more time will have to elapse before businesses begin to increase the amount of money they will spend on plant and equipment." Third item: Tokyo - Japan plans to put cherry trees on the U.S. west coast, and a \$3 million theater in Washington, D.C., as bicentennial gifts to the United States, the Prime Minister's office said today. A committee hopes to complete the details in time for Prime Minister Takeo Miki to announce the gifts when he visits President Ford in Washington in August, the spokesman said. The 550-seat theater would be on the top floor of the Kennedy Center, in space set aside when the Center was built in 1971. Fourth article - "A 2000-member letter carriers nation - union here will join in a nationwide postal strike if one is called," John Estes, vice president of the local unions, said. The president of the National Association of Letter Carriers in Washington threatened a nationwide strike if union and management officials don't agree on a 2-year contract for 600 000 postal workers. "There will be no mail deliveries next Monday if we can't reach an agreement within the week." Even though postal workers are forbidden by law from striking, it was said, "If we have no contract, we will have a right to withhold our services." Owen Young, public service officer with the post office here, said, "We don't know how many workers would stay off the job during an illegal strike. As far as we know, negotiations have not yet broken down, and we are assuming there will not be an illegal strike." Despite the unlawfulness of the strike, about 220 000 postal employees struck in 1970, when a 14-percent pay raise ended the walkout.

00 16 24 CC-H

Here's one about sports. In other news around the nation, a two-run single broke a ninth inning tie, and led major league baseball's National League All-Stars to a 6-3 victory over the American League last night. Secretary of State Henry A. Kissinger threw out the first ball in the game, and the second, too, as a matter of fact, when Rod Carew of the Minnesota Twins who caught it, wasn't satisfied. For Carew's benefit and that of the photographers, Kissinger threw again. Last item? New York - Joe Namath says he wants to play with the New York Jets 2 more years. On that optimistic note, Broadway Joe Namath began



final football negotiations with the Jets today. Neither he nor his attorney are taking a hard line. "We never had any serious problems," Namath said of his dealing with the team that signed him to a \$400 000 bonus when he came out of the University of Alabama 10 years ago. Namath, fresh from signing a \$5 million contract to sell perfumes and cosmetics, was to join his attorney Jim Walsh in a bargaining session with the Jets' president, Phil Iselin, and the team's lawyer, Dick Barovick.

00 17 46 CC-H And the last item I have is from Paris. Police arrested two men for climbing the city's tallest skyscraper with mountain picks and ropes, Alpine style. Police said the occupants of the 58-story Montparnasse Tower complained that the Alpinists were ruining the side of the American-designed building by sticking their sharp-pointed steel picks into the window frames. A police report said the men were asked why they decided to climb the building and replied, "Because it's there."

ACDR (Laughter) Very good. Ah, Bo, thanks so much for the news. Very interesting, all of it.

CC-H Thank you.

00 18 31 CMP You can't blame those guys for wanting to go to higher altitudes.

CC-H I can't either.

00 19 18 ACDR Houston, Apollo.

CC-H Apollo, Houston. Go ahead.

ACDR Yeah, Bo. You might pass on to Farouk - there's tremendous difference down here in this orbit we're at now compared to what we used to fly in Gemini up at 140 to 185 miles as far as observing features.

CC-H Roger. What kind of differences?

ACDR Well, as far as detail. And - -

00 19 43 CC-H You can see a lot more from this orbit?

Day 198

ACDR Oh, tremendous more. Also, looks like you're a  
lot closer too, comparatively speaking.

00 19 51 CC-H Roger. Understand.

END OF TAPE

Day 198

ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

00 22 52 CC-H Apollo, Houston. You can go BLOCK on the computer now.

00 22 58 ACDR MARK.

CC-H And we'd just like a subjective opinion how you think the temperature in the cabin is. We think we've got a configuration that should be suitable and the one we're planning to fly with.

00 23 24 CMP I guess it's pretty reasonable, Bo. We all enjoy going up into the DM though. It's cool and nice.

CC-H Roger. We copy. And, Apollo, I have just a couple of things that need to be gotten up to you. I owe you a couple of block data pads before you go to bed tonight, and so when you have a chance, please call me and I'll give you these and ask you a couple of questions. But looks like you're eating right now, so we'll let you finish that.

00 24 01 ACDR Okay.

00 29 24 CC-H Apollo, Houston. I hate to bother you, but if someone has a chance, we would like to terminate BAT A charge and initiate BAT B charge.

00 30 24 CC-H Apollo, Houston. We hate to bother you, but if someone has a chance, we would like to terminate BAT A charge and initiate BAT B charge.

00 30 35 ACDR That's in work, Bo.

00 30 37 CC-H Thank you.

00 41 03 CC-H Apollo, Houston. We'd like to have somebody give us a VERB 74.

00 41 17 ACDR Say again, Bo?

CC-H A VERB 74, please.

00 41 23 ACDR Roger.

CC-H And we have about 15 minutes left in this ATS pass. Whenever you're ready, we have a couple of items - items - to go through here and we'd like to be able to say good night to you at the end of this pass.

00 41 41 ACDR Okay, stand by.

00 42 22 DMP Okay, Bo. Go ahead.

CC-H Roger. I have a couple of questions. One is, we'd like to verify the position of the BMAG 1, that it is now in OFF.

00 42 41 ACDR That's affirmative. BMAG 1 is OFF.

CC-H Roger. Thank you. And I have a question about the CM height measurements. We would like to know what the measurements were on the CM height last night. They are in the Experiment Checklist on page 1-70 - on 1-60. That's page 1-60, Experiments Checklist.

00 43 13 DMP Okay, stand by.

00 43 16 CC-H And while you're looking through the books, I have some block data here.

00 44 35 CMP Houston, Apollo.

CC-H Go ahead.

00 44 42 CMP Okay. Here's the data on 1-60, Bo; CM measurements at GET 5 plus 52: seated height, 15.5 cent - centimeters; relative [sic] eye height, 27.6 centimeters.

CC-H Understand. 5:52, 15.5, 27.6.

00 45 07 CMP Right on. And turning to your block data, stand by.

00 45 14 CC-H Roger.

CMP Ready to copy block data.

00 45 39 CC-H This is for rev 33, 058:34:55; minus 179.2, plus all balls, plus 016.6; all balls, 113, 001; 161.9; 00:08; 007, 1625.2, 25729, 19:19; 20:40, NA; 309/050, 26:34, 29:19; plus 12.07, minus 159.72. Notes: 1 - assumes

no further rendezvous maneuvers; 2 - assumes rendezvous REFSMMAT; 3 - CM-SM sep, yaw right to 046 degrees, NOUN 48, pitch plus 0.45, yaw trim minus 0.34. CSM weight, 27700; DM weight, 4622. Over.

00 48 03   CMP    Okay, Bo. Block data pad rev 33, NOUN 33 starting 058:34:55; minus 179.2, plus all balls, plus 016.6; 000, 113, 001; 161.9; 00:08; 007, 1625.2, 25729, 19:19, 20:40, NA; 309/050, 26:34, 29:19; plus 12.07, minus 159.72. Remarks: assume - assumes no more rendezvous maneuvers; or rendezvous REFSMMAT; CM-SM sep should be yaw right 046 degrees, NOUN 48, pitch plus .40 - 0.45, yaw minus 0.34. CSM weight, 27700; DM weight, 4622.

CC-H       Roger. That's a good readback and I have rev 48 for you.

CMP        Okay. Understand you have another block data. Ready to copy.

CC-H       Roger. Are you ready to copy?

CMP        Ready.

00 49 34   CC-H    NOUN 33, 082:13:55; minus 198.6, plus all balls, plus 023.6; 008, 328, 344; 181.8; 00:08; 195, 1571.9, 25772, 25:54; 27:08, NA; 037/293, 32:20, 35:40; plus 13.97, minus 162.83. Notes: assumes rendezvous; 2 - assumes orbital REFSMMAT, 3 - CM-SM sep, yaw left to 300 degrees. Note 4 - NOUN 48, pitch trim plus 0.45, yaw trim minus 0.34. CSM weight, 27300; DM weight, 4622. Over.

00 51 43   CMP    Okay. Readback, Bo. Rev 48, 082:13:55; minus 198.6, plus all balls, plus 023.6; 008, 328, 344; 181.8; 00:08; 195, 1571.9, 25772, 25:54; 27:08, 037/293, 32:20, 35:40; plus 13.97, minus 162.83. Assumes rendezvous maneuver is already done; assumes orbital REFSMMAT; yaw CSM-SM sep, yaw left to 300 degrees; pitch trim plus 0.45; yaw minus 0.24. CSM weight, 27300; LM [sic], 4622.

CC-H       Roger. The yaw trim was minus 0.34.

CM         Yaw trim, minus 0.34.

CC-H       Roger. And everything else was a good readback.

CMP Roger.

00 53 02 CC-H And, Vance, did you change out the LiOH? And the reason we're asking is that we haven't seen much change here in our data.

00 53 11 CMP No. We haven't started on the presleep checklist yet. And we'll stand by.

CC-H This was - back about 34:30.

CMP No. I guess we had a miscoordination up here and - we did - that one didn't come through.

CC-H Okay. It's no problem. We just wanted to make sure you got it before you go to bed.

ACDR Yeah, that was flagged in the Flight Plan, Bo. We were in the middle of doing that SM activation.

CC-H We understand. And one other item and that was about that umbilical for the exercise. How - you say it's just too long - too short to be able to exercise comfortably up in the DM with the umbilical attached down in the CM.

CMP Bo, it doesn't stretch into the DM, but let us take a look at it tomorrow in the tunnel area, okay?

CC-H Well, we'll take a look at it down here - and see how long it is. It's the DP's that has the - -

CMP Okay.

CC-H - - longest cord.

00 54 48 CMP And do you want the suit hose attached to the VTR all night? Or could that serve as cooling in here?

00 54 58 CC-H I'll check with INCO.

CC-H Apollo, Houston. It seems that we don't need it on the VTR, but we'd like it on the VTR. And we feel that all that heat probably comes into the cabin wherever it is.

CMP Okay. Very good. I slept next to the VTR last night, and I know it's hot.

00 55 51 CC-H Okay.

00 56 47 CMP Houston, Apollo.

CC-H Apollo, Houston. Go ahead.

CMP Okay. I think the argument for - really the reason why I asked if we could have that - those hoses not on the VTRs, it gets good circulation. I think that's why the DM is so cool. We have two hoses circulating air in there. Of course, we can leave the cabin fans on all night. But as you know, they're pretty noisy.

CC-H Roger. We have about a minute and a half here until LOS. And we think that you can turn the three VTR POWER switches to the OFF position for this evening, and leave the hose in the cabin if that's what you wish to do.

00 57 27 CMP Okay. Thank you very much.

00 58 11 CC-H Apollo, Houston. We will see you at Orroral here at 36:41, just a couple of minutes from now.

00 58 17 CMP Okay. Very good.

01 01 44 CC-H Apollo, Houston through Orroral for a little over a minute.

01 01 49 ACDR Okay.

01 02 39 CC-H Apollo, Houston. There are 30 seconds until LOS. We'll say good night to you, and the wake-up time will be as scheduled on the Flight Plan. That's Hawaii at 44:50.

01 02 51 ACDR All righty.

CC-H (Good night.)

ACDR (Good night.)

CMP (See you later.)

CC-H (See you later.)

01 03 05 CMP Canister's changed.

END OF TAPE

## ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

08 07 09   CMP       Houston, Apollo on ATS.

          CC-H       We are with you, Vance. How do you read?

          CMP       Pretty good, Crip. Got a little something to report to you here.

          CC-H       Okay. We've been noticing you on the DSKY and seeing SCS, and we noticed that an alarm - IC DU alarm. What else you got?

          CMP       Well, at 43:20, approximately, we got a program alarm, IC - ISS light, alarm 3777. Came down here, went under SCS control, wide deadband, kind of looked into it, the ball, the FDAI that is, and the NOUN 20 seem to agree. With that in mind, why, we just had a few minutes to wait, so we thought we wouldn't change anything so that you could look to try to determine what caused the alarm.

08 08 10   CC-H       Okay. We're looking at it right now, and it's looking good. Incidentally, Vance, we also showed about 42:32 that apparently you guys had a C&W onboard and reset it, and we never could find anything here. Can you enlighten us on that?

          CMP       That's right. A couple of hours ago we did have an alarm. I came down and looked, and there wasn't anything on the display panel. It was a transient apparently, so we turned it off and went back up. And we have BMAG 1 up now. And we had drifted off a little bit in attitude. I don't know if it happened when the alarm occurred or if it happened mainly as I was in SCS waiting for BMAG 1 to come up. But I sort of wanted to try a P52 to see how it all looked, but noticed that you're not supposed to call a VERB - or a new program with this alarm - with this jet fail alarm EMP running, so decided to wait until you came up.

08 09 26   CC-H       Okay, that disables it. Let's find out what - specifically what course of action we want you to take here.

          CMP       Okay.



08 10 18 CC-H Vance, can you tell us what you think might have been out attitude when you selected SCS control and the fact that the BMAGs weren't warmed up - weren't up yet might have caused that - caused you to go out of attitude, rather?

08 11 03 CC-H Vance, you still reading us okay?

CMP Roger. Loud and clear. I guess you didn't get my last - I said, I think it's possible that we could have drifted off while I was in SCS, waiting for BMAG 1 to come up.

CC-H Okay. That's - that's what we think probably - probably occurred right now. We didn't have data on - on that particular portion of it, so that we could tell - tell exactly what happened. Right now, to make you feel more comfortable at least, everything looks hunky-dory here, and we - had a transient problem of some nature.

08 11 45 CMP Okay. Is it okay with you if I go back to SPACECRAFT CONTROL CMC then?

CC-H We would recommend that. Go ahead.

CMP Okay. And how about BMAG 1? Should I leave it up or power it down again?

CC-H We recommend leaving it up.

CMP I thought so. I - I think that'd be neat.

08 12 59 CMP I'll tell you that alarm sure wakes up a crew. I mean especially the 3777.

CC-H I'm sorry, Vance, I couldn't get all that. Would you say it again about the 777?

CMP I say that - that sort of an alarm sure wakes up a crew.

CC-H Oh, yeah.

CMP And makes them very alert.

CC-H Roger. Understand that. Vance, we suspect that we had some kind of a transient in the CDU right now. We're not - not positive as to what it was.

Day 198

08 13 48 CC-H Vance, can you tell us whether you did a VERB 40 after you saw the alarm?

ACDR Negative. He did not do a VERB 40. And also when we had the - the warning, Crip, we also had that - a orange ISS light for a while.

CC-H Yeah, we understand that, Tom.

CMP Crip, I did not do a VERB 40, although I was tempted to. I did not do a VERB 40 because it looked like the ball agreed with NOUN 20. But I wonder if you'd like one now to make sure they're really synced real good.

CC-H Negative. We were just asking here so we'd understand what our data was showing us.

CMP Right.

08 14 33 CC-H Okay. Our recommendation is to allow you to get a little more sleep because you've certainly got a heavy workday tomorrow. And that's supposed to start off here in - oh, in about another 52 minutes. Why don't one of you get on the headset, such that if we got a problem, we can - we can holler at you or hear the alarm and go ahead and ... secure the speaker box. And try to get some more rest. We're going to be with you through the ATS here for about another 40 minutes if you need to holler at us.

CMP Okay. Very good. I guess we have an EMP to help out on problems like this, don't we, incidentally - if we find that we have - this sort of a problem. Okay, we got another one, Crip. ISSS [sic] and both of them - a light and PNGS light.

CC-H Copy that. We're looking.

CMP 3 and triple 7. And I'll hit a reset whenever you say.

CC-H Your attitude is looking good. Looks like there are no - no problems on that.

08 15 57 CMP Right.

08 16 32 CC-H Well, we show you got another one.

CMP Right. And another one.

DMP Yeah, down below we have the PNGS and the ISS.

08 16 58 CC-H Apollo, Houston. I see you went into SCS there. We believe that you're getting false alarms right now, and we're looking at some way to mask it.

CMP Okay.

08 23 05 CC-H Apollo, Houston. I guess to take out one more variable here, we recommend that we go ahead and terminate the jet on monitor EMP by reselecting POO. It's masked anyway by having the ISS light on. And to make you feel comfortable, we're going to be watching you most of the time anyhow.

ACDR All righty. Real good, Bob. I will go ahead and select POO right now.

08 23 36 ACDR Okay, do you want me to reset the program alarm?

CC-H Yes, you might as well go ahead and reset it, Tom.

ACDR Yeah. We still have just the ISS warning light on.

CC-H Copy.

08 26 33 ACDR Houston, Apollo.

CC-H Go ahead.

ACDR Okay. And now, Crip, our ISS sublight has gone out. I don't know exactly when I reset the master alarm, but the ISS sublight stayed on for a while, and while we were working around here, it suddenly went out.

08 26 53 CC-H Okay. And we're also watching that - we've got a repeater on those lights down here, Tom. And we saw it go out but can't seem to correlate it to anything. But that's being driven by an ICDU failure indication, which seems to be a false one.

08 27 10 ACDR Yeah, let's hope.

CC-H Roger that.

Day 198

ACDR Yeah, there's nothing more that'll wake the crew up than an ISS failed light on the day of the rendezvous.

CC-H Roger. Also, did a pretty good job on G&C.

08 27 42 ACDR And the light's back on again.

CC-H ...

08 29 31 CC-H Apollo, Houston. Tom, we'd appreciate it if you would go ahead and reset that alarm. What we're trying to do - -

ACDR Okay ...

CC-H And, if you could - if you would do that as a matter of course if it reoccurs. The only thing that we've been able to see down here is the possible correlation with some pitch firings. And we're trying to understand that and keep an eye on it although it - can't understand why that would be occurring right now.

ACDR I can't either. Now we're in SCS and wide deadband.

CC-H Yeah. We're watching. That's - that's fine. We - we see you there and it's no problem. Just go ahead and stay there.

ACDR Okay, Bob.

08 30 38 ACDR Hey, Crip. For the ECS ... With those, you know, two sets of hoses feeding in the docking module, it really got cold up there. So we're just going to just operate with one set of hoses into the docking module. Over.

CC-H Okay. We copy that. Just for the record here, can you tell us which set you're going to leave up there, Tom?

ACDR Hang on. The center set: the center hoses.

CC-H Copy that.

08 33 55 ACDR Crip, we just had a roll jet fire, it looks like.

CC-H Rog.

ACDR Do you want me to damp it? Okay, I've gone to MIN - I've gone to MIN IMPULSE and damped the rate. Back to RATE COMMAND.

CC-H Rog. I - I didn't understand why you went to MIN IMPULSE and stopped the rate. Would you repeat that, Tom?

ACDR Yeah. In other words, we're in SCS, and we suddenly heard the thing fire, and then build up a rate and roll of about 0.2 of a degree per second. So I went to MIN IMPULSE. Most level with the yaw rate. I went to MIN IMPULSE and damped it. We're in SCS CONTROL. In other words, if I hadn't have damped it, we would go ahead and finally hit the deadband, it would have pulled it back the other way.

CC-H Roger. Understand. Its just working in the deadband would have been - been okay.

08 36 11 ACDR I'll say one thing, while they got the G&C people working on that. ... not - no time-critical thing - give us a how-goes-it with respect to how we're doing on our budget in RCS and H<sub>2</sub> and O<sub>2</sub>.

CC-H We'll get that up to you.

08 37 10 CC-H AC, Houston. Tom, for your information on consumables, we're right on on H<sub>2</sub> and O<sub>2</sub>. And on RCS propellant, we're 39 pounds below the - the nominal line. And, of course, remember in the Flight Plan Supplement, we got predicted curves on those things if - if you just wanted to take a look at that.

ACDR Okay: good.

08 39 14 CC-H AC, Houston. Tom, can you give me an idea what - how you're configured in the vehicle as far as listening now? Am I keeping everybody awake talking to you or - -

ACDR No. Hey, look after that - no sweat, Crip. Vance has already shaved, and Deke is shaving, and I'm starting to prepare breakfast, while keeping the comm here in the left seat. So after that ISS sublight, nobody's going back to sleep.

CC-H Okay.

ACDR I'm the only one that's on the headset right now.

CC-H Okay; understand that. I guess when Deke gets all squared away - I think yesterday they talked a little about the problem we were having on the furnace. They had to go back there and check the helium a couple times. The thing is acting like it's leaking helium out. Consequently, we're going to have to - to end up deleting that one sample that we were going to do today before we do the joint sample with the Soviets. And I'm going to have to modify - his time line a little bit, and I'd like to talk to him about that when he gets a chance.

08 40 13 ACDR Okay. I'll talk to him as soon as he gets the headset.

CC-H Okay. No rush. We got plenty of time here.

ACDR Okay, Crip. You say they're leaking helium from what, the helium source or from the furnace? Over.

CC-H Well, from the - from the furnace itself. What it looks like is that when you inject helium into the furnace, it starts coming down at the predicted rate that it should. Then - but after it stays in there awhile, it - it acts as though the helium must be leaking out of the furnace because the cool-down rate goes back to - to that that we normally get with the vacuum.

ACDR Understand.

08 41 15 CC-H AC, Houston. Tom, it would help us out a little bit, maybe, on trying to see if we can find a correlation, if you would select MINIMUM IMPULSE and give us a minus pitch command.

ACDR All right. I'll go to MIN IMPULSE on SCS and give you a minus pitch command. Okay, here we go with minus pitch.

08 41 39 ACDR MARK it. There we go.

08 41 44 CC-H Okay. We're looking at it. It didn't seem to generate one for us.

08 46 16 ACDR Pardon me. I just inadvertently hit the - -  
CC-H I'm sorry, would you say again, please?  
ACDR I just inadvertently hit the hand controller. Now I got it locked up.  
CC-H Okeydoke.

08 48 17 CC-H Apollo, Houston. Tom, we would appreciate it, since you're up and can watch things for us, if you would go - go ahead and go back to CMC CONTROL. That'll allow us to see what the attitude errors are and correlate it with - with our jet firings, if you don't think that'll be a problem.  
ACDR Okay, I'll go back to CMC.

08 48 35 ACDR MARK it. In CMC.

08 52 35 DMP Crip, you still with us?  
CC-H Yes, sir.  
DMP Okay. Would you guys like to have the old daily status report?  
CC-H I'll tell you what, we're just coming up on where we're going to have LOS here. And we're going to see you again at Hawaii in about 15 minutes. Possibly, if we can get it from you there, and we'll also talk to you about the - the furnace procedure that we want to - want to use. It calls for you about there to shut down the furnace. We do not want you to shut down the furnace, and we're going to - going to tell you what you - we want you to do. So you can hold up on any activities regarding that until we get with you.  
DMP Okay, great. Thank you.  
CC-H Okay, fine - -  
DMP I'll see you ...  
CC-H We are getting ready to lose you here and again, we'll see you at Hawaii in 15 minutes.

Day 198

09 06 43 CC-H Apollo, Houston talking at you through Hawaii.  
We've got you for 5 minutes.

DMP ... do you read? How do you read?

CC-H Okay. A little weak. How me?

DMP ...

09 07 05 CC-H Apollo, Houston. How do you read?

DMP Okay, Crip, we read you.

CC-H Okay. Understand you're reading me. I'm - I'm still  
getting you very weak. Got several items I need to -  
to run down here primarily regarding the furnace.  
Is - is the AC listening? Tom, I have one item for  
you first.

ACDR Go ahead, Crip.

CC-H Okay, I had you terminate the jet on monitor  
while ago, and the Flight Plan calls out about -  
coming up now that we also wanted you to zero the  
NOUN 26's. And that's it, just do the VERB 21  
NOUN 26 ENTER it and put in all balls.

ACDR Okay.

CC-H Okay. And I've got Deke with me. I can talk to  
him about furnace operations.

DMP Okay, go ahead. Go ahead, Crip.

CC-H Okay. fine. I guess before I start into that -  
that - is - if Tom has got time, he can go ahead and  
initiate the VERB 49 that we've got called out at  
45 hours right over on the next page of the Flight  
Plan. And we can take a look at it here while  
you're doing the maneuvering. That's just to set  
you up for the next ATS pass.

DMP Okay.

09 08 40 CC H Okay. Deke, I don't know whether you heard me talk-  
ing to Tom earlier about the furnace, but that helium  
cooldown procedure doesn't seem to be - seem to have



some kind of a problem with it. What we'd like to do, if you've got time to go up there now and take a look, we'd like to get a pressure reading, please. And also we'd like to verify that the - the ISO and the vent valves of the furnace are closed good.

09 09 06 DMP Okay; stand by. I'll go give it a whirl.

09 10 17 DMP How do you read?

CC-H Just getting a lot of squeal there. We're with you.

DMP Okay, I'm reading ...

CC-H I'm sorry, Deke, you're completely unreadable due to that box - through the box due to feedback. Tell you what, if you'd just note the thing down, and before you - if you're reading me, before you go down in the command module to come back, what we would like to do is to inject air into the - to the furnace. And if you've got the Docking Module Checklist handy, all we want to - need to do is to make sure that the valves on 880 are closed, like we just talked about, the ISO VALVE and the VENT VALVE. And then we need you on the helium supply box to open the two furnace valves and open the FROM DM ATMOSPHERE valve for 10 seconds, and then close it again, and then close the two furnace valves. That's just to put air into the - the furnace and allow us to cool down a little bit more rapidly.

09 12 01 DMP Hey, Crip. Could you give me a ..., please?

CC-H I'm sorry, Deke. I can't read you at all through that - through that box. We're 1 minute from LOS now, and our next station contact will be through the ATS at 45:18.

CC-H Okay; okay. With that attitude, the ATS angles that you've got in your Flight Plan will be okay to pick us up there, and we do not want you to do any furnace prep operations for the SA001. We'll talk about that later.

ACDR Roger. What page of the checklist did you want Deke to go to?

Day 198

TAG Tape 198-02/T-20  
Page 11

CC-H      Okay, it's the furnace shutdown procedures, on - in  
            Docking Module Checklist, 7-6. And we want  
            him to perform steps 2 and 3; steps 2 and 3.

ACDR      Okay. Steps 2 and 3 on page 7-6.

09 13 01    CC-H      That's affirm.

END OF TAPE

## ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

09 39 43 CC-H Apollo, Houston. Talking at you through the ATS. Got you for about 46 minutes. How do you read?

09 39 52 ACDR Read you loud and clear, Bob.

CC-H Okay, fine. I - due to the problem we were having talking to Deke through the squawk box, I guess I got several items I need to run down with him on the furnace, still; and then we can pick up the status report.

ACDR Okay. He's just coming on the headset now.

CC-H Okay. No rush.

DMP Okay, Crip. I went ahead with that procedure per checklist.

CC-H Okay. Understand you did do that procedure on injecting air as we talked about.

DMP That's affirmative.

CC-H Okay. And did you pick that up just about the time - about LOS at Hawaii?

DMP Yeah.

CC-H Okay. That's good.

DMP And I recycled the valves.

CC-H Okay. Good deal. What we're going to do now is if you can - have got your Flight Plan and your Docking Module Checklist handy, I'm going to just have you make some notations in it about how we're planning on handling the furnace ops for the - at least for the rest of the day.

DMP Okay. We're kind of in the middle of breakfast here and we don't have the DM Checklist. We do have the Flight Plan.

CC-H Okay. Well, we - the ones in the DM Checklist are kind of minor. I can give them to you now or if you want to hold up until you finish breakfast, we can do that.

DMP Okay. Stand by. Vance is going to get our spare here.

09 41 38 DMP Okay, Crip. We got it.

CC-H Okay. Before we get started in it, basically what we're going to do is to eliminate this sample, SA001. And we're going to delay taking out the - the sample you got current - currently in there. If you can look - we already talked about deleting the prep you had at 44:55 and we want to delete the prep - or the ops at 45:40, 45:40.

ACDR Okay, Crip. We're going to delete sample 001, right?

CC-H That's affirm.

DMP Okay.

CC-H Okay, fine. And there is a - over at 47:20, you have a - an "End manual heat soak and perform helium injection." What we would like you to do is to add a furnace shutdown, **page D/7-6**, and that will be for MA041, which you currently got in there. I would like to warn you that the thing - the handle where you grab it, or the end of the sample, is going to be down where it's certainly cool enough to touch, but the other end is going to be hotter than normal. However, we still want to go ahead and get it out so it won't interfere with any of your joint operations today. It shouldn't be any problem, just warn you, don't touch the - the end of the sample; only grab the end that's sticking out of the furnace.

09 43 26 DMP Okay, understand. What you're saying is we're going to take those samples out now instead of waiting until we're into the joint activities with the Russians. Is that correct?

CC-H We're going to take the samples you've got in there out at 47:20, that period of time just before you close out the docking module.

DMP Okay.

ACDR Roger. I got that. The furnace shutdown 40 - for 041 at 47:20.

CC-H Okay. That's - that's fine. And if you'll note over at 52:40 in the Flight Plan, we call out a helium injection there. Now that was - just delete it because we haven't got anything in the - in the furnace at that time.

ACDR Roger. I see that.

CC-H Okay. Also, at 56 - -

ACDR Okay. Do you want us to go ahead and do that helium inject or not?

CC-H No, we want you to delete it at that time, because there's nothing in there and no reason to do it.

ACDR Roger.

09 44 32 CC-H Okay. At 56:50, we have a furnace shutdown that we want you to delete, again because there's nothing in there.

ACDR Okay. Got the deletion at 56:50.

09 45 05 CC-H Okay, fine. Since we're talking at you through the ATS and we're getting ready to dump our tape recorder, we're going to have to change our modes on it. I'm going to drop out here for about 30 seconds. I'll give you a call when we've got comm reestablished.

09 46 20 CC-H Apollo, Houston. How do you read now?

ACDR Loud and clear, Bob.

CC-H Okay, fine. Those last two entries that I gave you, the ones at 52:40 and 56:50, are the ones that end up occurring in your Docking Module Checklist. And they're just repeated in there and all I was going to do was to have you delete them out. I guess, just as a point here, normally when - when you're taking and getting ready to put in the sample from Valeriy, Deke, it will - you normally have to pull out a sample. Of course, this situation is - there's not going to be a sample in there.

DMP Okay, copy that.

CC-H Okay, I guess the only other item I didn't get off to Deke earlier, if he had a chance to read the pressure in the furnace before he went ahead and made the - the air inject. We would be interested in hearing what that voltage indication was.

DMP The voltage was zero.

09 47 27 CC-H Roger. Understand it was reading zero at that time. Deke, I guess one other question that we had hanging fire here and normally we wouldn't go into this kind of thing, but since things were getting moved around quite a bit yesterday and we need to make sure it was off, can we verify that the biostack was turned off yesterday morning per schedule? The reason for that, it's got a limited battery life on it and if it was left on, it - we wouldn't be getting to use it post - in the - the post joint phase.

DMP Well, none of us can answer your question, seems like. Stand by 1.

ACDR Yeah. Crip, do you read?

CC-H Yes, sir.

09 48 17 ACDR Yeah, it got turned off.

CC-H Okay.

ACDR It's logged in the Flight Plan.

CC-H Okay. That's - that's all we need to know.

CC-H Okay. And I guess whenever you guys get around to it, we'll be glad to take your morning status report.

09 48 52 DMP Okay, I'll give it to you right now. Okay, ready to copy, Crip?

CC-H Ready to copy.

DMP Okay. On the commander: menu, everything eaten for breakfast; lunch, missed applesauce - couldn't find it; and evening meal, missed the stewed tomatoes, couldn't find them, and had an orange-pineapple - supplement.

09 49 47 DMP Are you ready to go on?

CC-H Roger. Understand on that last that the orange and pineapple was an addition?

DMP That's affirm.

CC-H Okay.

DMP Okay, then going over to the medical log. Day 2 PRD, 11001; sleep, 4 good hours and 2 fair. No medication, and he is full of water. Carrying a full tank. Okay, and ready with the CP whenever you are.

09 50 39 CC-H Press on.

DMP Okay. Breakfast and lunch were standard. Dinner, no cranberry sauce, couldn't find that, and add an extra strawberry drink. And stand by for the medical log here. Okay. His PRD is 48062. Had about 4 good hours of sleep and 1 fair, with no medication, and estimates about 75 seconds on the water gun. Okay. Go to the DP whenever you're ready.

09 51 45 CC-H Press on; we're with you.

DMP Okay. Breakfast, standard; lunch, no salmon or rye bread, couldn't find either one of them. Oh, yeah, we found the salmon later in day. It's still around here somewhere. Okay. In the evening, a couple of problems there. Couldn't find the vanilla pudding, so scratch that. And the macaroni and cheese, I couldn't rehydrate it, and I was going to try to eat it dry and as soon as I opened the package, all those little critters started flying around the cabin, so we stashed that one quickly. And the same happened with the chocolate nut cake, that was all crumbs and a total disaster so we stashed that before it got out of control. I had two pineapple and oranges. Okay, go to the medical: PRD, 61002. And on the sleep, I had 2 to 3 hours of super sleep and a couple fair to poor. I think we should comment on all of our sleeps. We had a **MASTER ALARM** here about 4 hours after we went to sleep and then we had another one later and we all got up for that one and been up since as you're aware of. And I slept in the DM last night, and it's pretty cold in

there. I think that's one reason I didn't sleep too well. Vance slept in the tunnel and that seemed to be perfect. As far as water, I had 15 gulps and I've calibrated and I think about a 5-second flow per gulp, for whatever that's worth. And that is the end of the old status report unless there's something you'd like to know.

CC-H Okay, real good. We - we got all that and appreciate the calibration there. Hey, one item. Apparently, you gents asked about dosimeters yesterday, and to clarify to make sure we're talking about the same ones you were asking about returning and we believe you were asking about the passive dosimeters that are sewed into your CWGs. Is that affirmative?

09 54 13 DMP We're talking about the ones that were on the launch underwear, yeah.

CC-H Okay, fine. What we're supposed to do there is your other CWGs for **entry are stowed in A-1 and we are** supposed to end up bringing back your used CWGs, with the passive dosimeters in them, **in A-1**. So, they are to be saved and returned.

DMP Well, okay. We removed them from the underwear, and we got those that are little hot pockets here because we were assuming we were going to throw that underwear away.

CC-H Okay, you can just put them so that we can find them in **A-1 somewhere and that will be fine**.

DMP Okay.

09 54 57 CC-H Yeah. Deke, in - apparently you guys are having what sounds to me like quite a bit of problems finding certain food items. Anything you think we can do to - to help you out on some of those? Are they just not stored where you think they're supposed to be?

DMP Well, we ended up, I think, with things strung together and pull them out in sequence, and that seems to be working fine. I think what's happening here is that there's some extra items on some of these meals that are stowed separately and those are the ones we haven't located properly.



Day 198

09 55 30 CC-H Okay, we - we'll check into it and see if we can't give you a little bit of help there so you won't be missing so many of those items. On that rehydration problem you had on the macaroni, was it just you couldn't get the water inserted or - or what?

DMP No, you can get the water in all right, but it was pretty dense stuff and there's no way in zero g to get it to mix - -

CC-H To get it mixed up good. Okay, understand the problem.

DMP Yeah. Right. And what we started doing this morning, we pulled out the menu and looked at it because we weren't doing that before, you know, and we weren't sure we missed something at all until we went to log it and discovered, "Hey! I was supposed to have that," and we didn't have it. So we'll try to look at the menu here in the future when we get a chance.

CC-H Okay. I'm with you. One other item I guess I'll mention here and let you do with it as you see time fit this morning ... We scrubbed out that height measurement DTO that was scheduled yesterday because we got so far behind. If you gents feel like you've got time enough to - to get it in sometime this morning, that will be fine and if you don't, well, use your own discretion. If time is short, our priority would be to get Vance, since we've already got a preliminary reading on him, and as our intent is to get a curve of how the change occurs. So if you could only get one, he would be the prime man we'd be after.

09 56 51 DMP Okay, we'll see how we're running on time and do the best we can with it.

CC-H Okay. And we do not need a **waste-water** dump as scheduled this morning; we do not want to dump it.

CMP Roger, understand. And when we chlorinated last night, we again opened the potable and - to perform the chlorination and we didn't close it. I presume you don't mind if we leave it open now or would you prefer to have it closed?

09 57 20 CC-H We would like to go ahead and close it if we could.

CMP Okay.

DMP Are we just coming up on Africa, here?

CC-H That's affirmative.

DMP Man, we're looking at some fantastic scenery here; weren't sure where we were.

DMP We can see fires, grass fires, and that sort of thing burning down here just like you can from 40 000 feet, Crip.

CC-H Roger.

DMP They're all over the place.

09 58 33 CC-H Deke, one item I men - might mention to you on that air injection you did. I guess we want you to understand that procedure because we're probably going to be - be asking you to use it several times and it might be worth your making a note about on your Docking Module Checklist someplace, what you do when you - when you inject air. But, basically, it just those steps that - those two steps in the shutdown procedure.

DMP Rog. Copy. Thank you.

CC-H Okay, the only other item was, we had that little problem with the hatch on the heat shroud for the furnace. And we would prefer here, even though I guess it was on, that we - we'd figure out a way of closing that. Our recommendation is that you take one of your little sticky pieces of Velcro and put a patch on the furnace shroud itself, and the other side on that strap on the hatch that's normally used to retain it to the bulkhead, so that you can just Velcro the hatch closed.

09 59 38 DMP Well, I tell you, Vance came in there to help me after a while, and he's stronger than I am, I guess. He gave it a try and finally got it closed.

CC-H Okay, understand that - that he was getting the - the normal connector to go ahead and close then.

DMP That's affirm. But it binds pretty good, and I think your suggestion is still a good one.

CC-H Okay.

CMP It looked like you could - looked like, Crip, you could trim some of that rubber sealing material right near the hinge, and that might help to let it close. It takes about all the strength a guy's got to close it.

CC-H Okay, I guess you might still look at going ahead and doing that Velcro because we think it would be adequate to go ahead and just Velcro it closed.

10 01 05 CC-H Deke, just to make sure we understood. You - while ago, when you cycled those valves on the furnace for us, the ones that vent overboard, before you cycled them are you pretty positive that - that they were in the closed position?

CMP He thinks so.

10 01 25 CC-H Okay. Fine.

10 12 48 CC-H Apollo, Houston. Don't know how busy you are there, but if you are interested, I could give you a little bit of the - the local morning news. Otherwise, we can hold it up and Bo can repeat his performance of last night and give you some this evening.

CMP Hey, that sounds great, Crip. Need morning and evening news both.

CC-H You haven't heard me read the news yet, so I don't know whether you're going to think it's so great or not. But I'll be glad to give you what I got. Little bit on your - -

CMP You have a - you have a reputation as being a great newsman, from Skylab.

10 13 19 CC-H Oh, yes. I got several reputations from that mission. An item regarding your cohorts up there. It says, "Don't we look like the Jack of Diamonds," joked the Soviet cosmonaut as his partner drifted upside down beside him in their Soviet spaceship.

"We're proud of you because you're doing everything so well," the Soviet ground controller replied, as the space duo readied for today's linkup with the three American astronauts. Lieutenant Colonel Alexey A. Leonov and his civilian partner, Valeriy Kubasov, were so busy with space chores Wednesday, they didn't have time to stow away their - the blastoff suits and helmets. But the two cosmonauts promised television viewers to have their tiny cabin tidied up in time "to receive our guests." So it sounds like they're looking forward to seeing you. One of the tasks taking up so much of their time was repairing a balky television camera that had prevented viewers on Earth from watching their activities in space. Leonov and Kubasov got up an hour earlier than planned to work on the camera, which was finally fixed under the direction of experts at their control center. The picture of Leonov with Kubasov floating by upside down highlighted the first day of cabin telecasts to millions of Soviet viewers back on Earth. And we even have a - have an item for the commander, there, from his state. From Hugo, Oklahoma. Searchers Wednesday flew over the brush in airplanes and tramped on foot and horseback, hoping for a sign of two baby elephants. To Dixie Loader, it was like pounding the neighborhood looking for a missing pup. "They are like pets," she said. "They mean something to us other than just working elephants. You know how you have a pet dog or cat and it was - has a sentimental value." Apparently, she was driving a truck loaded with five elephants from Michigan to Mexico, and stopped to rest in the winter quarters of the Carson-Barnes Circus Saturday. ... and Lilly, the smallest of the five, at 4-1/2 feet and 1000 pounds to 1500 pounds each, were spooked and bolted into the countryside. So I guess we got some new wildlife in Oklahoma. An item regarding some weather. We're getting information from San Juan, Puerto Rico, that a cloud of sand, from the African Sahara, is hanging over the Caribbean Wednesday, inhibiting, for the second time this month, the chances of rain to ease the widespread drought. Jose Colon, the Weather Bureau regional director, said the sand cloud, which had blown thousands of miles across the Atlantic, was at a height of about 8000 to 10 000 feet. Colon said the sand was reducing the

amount of the Sun's radiation reaching the Earth and so diminishing the chances of rainfall. The Caribbean region has been suffering from a serious drought during most of 1975, reducing agricultural production and, in the case of Haiti, leaving about 350 000 rural peasants on the brink of starvation. Kind of in contrast to that, another round of rain showers has splattered the east coast Wednesday, dumping up to 6 inches of rain on parts of Georgia. The rains threatened to worsen conditions in flood-torn New Jersey, while state officials pleaded for disaster aid. Flash-flood watches were posted from Virginia through Maryland and Delaware at - and for an area including northern New Jersey and south-eastern New York, including Long Island. So when you guys work your way over there a little bit later today, you might see quite a bit of clouds, apparently. To show you it's getting tough all over, City Hall employees in San Francisco have been advised to bring their own towels if they plan to use the washrooms. It's a budgetary problem. The washrooms are without paper towels because the Buildings and Ground Maintenance Department ran out of money at the end of the fiscal. However, city officials promise that the towels have now been ordered and should be in the washrooms in 2 weeks. It's a tough life.

ACDR Yeah.

10 17 14 DMP Okay, Crip. We noted all that with pleasure.

CC-H Yeah. Not very exciting news, I'm afraid, I got to give you. But apparently, all of it's fairly reasonable.

CMP I heard you used to read the funnies, too.

CC-H I can't read the funnies, because I keep getting choked up. And you can't talk while you're laughing.

CMP Okay.

CC-H They used to tell me that, when I read the news, that was the funnies.

CMP            Could be, yeah. That's great, Crip. And this morning, we had more time to listen to that sort of thing than yesterday morning.

10 18 01    CC-H            Yeah. A little bit more relaxed today. I guess - mainly because you poor guys had to get up so cotton-picking early and tend to your little problem there. I guess - you know, let - let me give you a little bit of information. We're still looking into that. I guess we haven't had a repeat of that ISS alarm. We've noted that we had something almost identical back on John Young's flight, on 16, which we ended up attributing to a diode problem in the ICDU's failure detection logic. And that really wasn't any of a problem other than giving nuisance alarms. We're still looking into it, and any more information we can get - get to you, we'll get back with you.

CMP            Okay, real good. We haven't had it for quite awhile. Do you think it could in any way be associated with the EMP we had running last night?

10 18 53    CC-H            Well - we'd kind of thought of that. But we ended up getting one after, I believe, we did terminate it.

CMP            Okay.

10 20 25    CC-H            Apollo, Houston. We don't need it now, but before you terminate it, I'm afraid we're going to have to ask you for another battery charger current and voltage. The reason for it is that we're - we're dumping data, which we hadn't planned on doing right now, covering up the dump - ... we had planned on a data dump but, unfortunately, it's covering up our battery charge, and to help us keep a status of how much juice we've got in those, we need that information.

DMP            Okay, Crip. I'm reading about 39.2 volts and about 1.1 on the amps.

CC-H            Okay, Deke. Thank you very much.

10 21 17    CC-H            And, if you'd like, you can go ahead and terminate that charge at this time.

DMP            Okay.

10 24 46 CC-H Apollo, Houston. We're coming up on LOS through the ATS. The next station contact will be through Hawaii in 16 minutes. That's 46:21. 46:21.

DMP Okay, Crip.

10 26 17 CC-H As we go over the hill, we're seeing to the C&W.

DMP Solve our MASTER ALARMS and that stuff, hear?

10 26 44 CC-H Can you tell us what it is?

10 39 28 CC-H Apollo, Houston. We're talking at you through Hawaii. Got you for about 2 minutes here.

ACDR Okay. We can read you. Crip, I've got a question.

CC-H Go ahead.

ACDR For the G&C's, if we don't get this thing fixed during rendezvous, and if we're in these program sequences like 33, 4, and 5, and this comes up, is that going to stop the sequence on us? (Music)

CC-H Okay. We have checked that all the way through and it will not interfere with anything as long as the alarms are false, which is - that's the indication that we have, that they are now.

ACDR Okay. (Music)

10 40 18 CC-H For the DP: Deke, would you like to make those minor modifications to your Docking Module Checklist regarding that furnace, or do you understand it well enough such that when you come to them, and - that you will just delete them.

DMP Well, I think I understand it, Dick [sic], but I'd just as soon make them anyway, just so I got them.

CC-H Okay. If you've got that checklist handy, I can tell you where they are and you can go ahead and scrub them.

DMP Okay. Stand by a sec. Go ahead. (Music)

CC-H Okay. First one is on Docking Module Checklist page 2-4.

DMP Okay. 2-4. (Music)

CC-H Okay. In step 7 down there at the bottom, left-hand side of the page, last three lines, we can just delete those out regarding the helium injection.

DMP Roger.

10 41 13 CC-H Okay. And then on page 2-21, I'm - I'm -

CC-H I'm sorry, on 2-22.

DMP Okay.

CC-H Okay. Right below the photo there, it has doing a - "Perform furnace shutdown procedure." You can delete that since we've already got it shut down.

10 41 48 DMP Okay.

CC-H Okay. One thing you should probably note, there. If you've done the shutdown procedure we've called for earlier, you probably got the - the little caps installed in the furnace and the hatch closed, and of course, you will have to open the hatch and remove the caps so you can install MA150.

DMP Right.

CC-H Other than that, that's - that's all we got. I'm going to go ahead and tell you good morning here. And next station contact is going to be through Vanguard in 7 minutes, and I'll be turning you over to Richard and he'll be talking at you there.

10 42 20 , DMP Okay. Thank you, Crip. We appreciate it all.

CC-H Okay. Have a good morning, and a good day, and a good rendezvous. Next station contact again, Vanguard at 46:30 - 46:30.

CMP See you later, Crip.

CC-H Roger.



ACDR Roger. Thank you, Crip.

10 49 28 CC-H Apollo, Houston. Good morning through the Vanguard. Got you for 5 minutes.

DMP Hello there, how you doing this morning, Dick?

CC-H Hi, Deke. Good morning to you. We'd like to have ACCEPT if we could. We're going to get you a new CSM and Soyuz state vector, and when somebody can copy, I've got an NC2 preliminary pad in the Rendezvous Book, page 1-12.

DMP Okay. Stand by. You're way ahead of us. We haven't even got that book out yet.

CC-H (Laughing) Well, there's no - there's no big hurry; there's plenty of time for it, Deke. When you get ready to copy, I'll read it to you.

DMP Okay.

10 51 40 DMP Okay. Go ahead.

ACDR Okay.

CC-H Okay. Starting with NOUN 28. 048:31 four balls; minus 024.4, plus four balls, plus four balls; 340, 047, 359; 011.4, 00:01. Weight, 32178; trims, plus 0.69, minus 0.52; star check, star 14; 178.6, 13.2. And the TPI T<sub>ig</sub> time, 050:53:00.00. Go ahead.

ACDR Okay. Read it back here. Deke and I both copied it. 048:31 four balls; minus 024.4, plus all balls, plus all balls; 340, 047, 359; 011.4, 00:01. Weight, 32178; pitch trim, plus 0.69, yaw trim, minus 0.52; star check, 14; 178.6, 13.2. And the TPI T<sub>ig</sub>, 050:53:00.00. Over.

10 53 41 CC-H Okay, Tom. You got it right. That's a good read-back. The vectors are in. You can go back to BLOCK. We're about 30 seconds from LOS, and I'll be talking you again when we get on the ATS and I'll tell you about the rendezvous. But I can tell you in a short word today that it's just about as close to - we're set up to be just about as close to nominal as we could be. I'll have a few more words for you to tell you what you can expect, but there's no problem.

END OF TAPE

Day 198

TAG Tape 198-04/T-22  
Time: 198:10:54 to 198:12:15  
Page 1

ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

10 54 05 ACDR ... Sounds great; sounds great.

10 54 11 CC-H Super. And good morning to you, Tom. We'll see you at the ATS.

ACDR Roger.

11 10 42 CC-H Apollo, Houston through the ATS. How do you read?

ACDR Read you loud and clear, Dick.

CC-H Okay, Tom. Whenever you have a second, I got a couple of very minor things in the Rendezvous Book, and I thought I'd give you a couple of words about the rendezvous today.

ACDR All right. Go ahead.

CC-H Okay. If we could, why don't we do the book first. The first comment is on page 1-10.

ACDR Okay. We're there.

CC-H Okay. Crip called this up to you later - earlier in the Flight Plan. I just wanted to clean up the book. At 47:20 on the left-hand side, you ought to delete that entry that says "End manual heat soak and perform helium injection."

ACDR Okay. We've got that. Deke's got it, also, I think, in the Docking Module Checklist there.

CC-H Yes. Okay. Yeah, I was here while Crip was talking to you about that. I just wanted to make sure you had a clean book to start this morning. Also, on the right-hand side of the page, on the TV checklist, we need to add a step on panel 400, that's the VTR, to get the POWER INTERLEAVER and POWER TELEMETRY switches, two of them, to ON.

ACDR Okay. We've got everything. We have three OFF now. You want the POWER to INTERLEAVER ON, right?

CC-H That's right. The INTERLEAVER and the TM POWER switches need to go ON. The VTR, naturally, can stay OFF, until it has to come ON per the Flight Plan. Incidentally, while I'm talking about that, I'm not sure what your hose configuration is. But - what we desire is to go ahead and activate that VTR cooling activation on page 1-47 of the systems book, and then we can stop fiddling with these extra two switches.

ACDR Okay.

CC-H Okay. Next thing, Tom, if you'll turn the page back to - over to page 1-12, I'll give you some high-gain angles.

ACDR All right.

11 12 54 CC-H Okay. Over there on the left side. Pitch, minus 24; yaw, 149.

ACDR Roger. Pitch, minus 24; and yaw, 149; and that's at 48:20.

CC-H That's - that's right, that's correct, Tom. Okay. Let me just say a couple words about the rendezvous. After doing the little out-of-plane correction yesterday, we're set up right on centerline, looking real fine. The way the trajectory tracking is going, it does turn out that the NC2 burn is going to be just a little bit smaller than you've usually seen it in the - in the sims, but that's no problem. NC2 through TPI T<sub>ig</sub>s are nominal and be very close to where you've been seeing them before. Because of the slightly smaller NC2 burn, when we get to NSR, it will have a little more of a radial component than you have normally been seeing, but that's no problem either. The ball angles will be very close to nominal, all the way in. One comment on the NSR burn. The - it could go either - either way, but it may be as small or at least small enough such - like the burn we did the other day when we had to load a different EMS number other than 13.0. We never really got to talk about that again, but in any case, the numbers that we passed to you to load in the EMS, even though they're lower than 7, are okay to load in there and the numbers

to trim to will be accurate. So I don't think there should be any problem in the rendezvous this morning.

11 14 33 ACDR Okay. Good.

CC-H Also, as you know, we've got a new team on here. We've been looking at what - what's been happening about the false alarms on the ISS during the evening. I've read this report - as to John Young's flight on Apollo 16 and I don't think we're missing any of the same indications, at least, that he had and that turned out to be false alarms; and as Crip told you awhile ago, assuming that they are false alarms, you won't get any interruption of programs you're doing.

ACDR Okay. That's good.

CC-H Okay. I guess that was about it on the rendezvous. On switch configurations, there's one thing we'd like to get done. We've got the secondary loop deactivated. There's one valve we would adjust to get us in a nominal configuration. On panel 377, we'd like the GLYCOL TO RADIATORS SECONDARY valve to BY PASS, and this will put us in a completely known configuration.

ACDR Okay. On 377, to BY PASS.

CC-H That's affirm, Tom.

11 15 46 CMP ... we have the VTR cooling implemented.

CC-H Okay. Real fine, Vance. Thanks for letting us know. Have you - did you do the P52? Could I get that data?

CMP Roger. Tom has it here.

CC-H Okay. I'm in no hurry, but whenever you get a chance.

11 16 30 DMP Okay. Okay. That's star 33 and 42, all balls; minus 15.6, minus 14.7, plus 60. Torqued at 46:36:15.

CC-H Okay, Deke. Thank you very much. Appreciate it.

DMP Sure.

11 17 07 ACDR Okay, Crip [sic]. Panel 377 is in BY PASS.

CC-H Okay, fine. Tom, thanks much.

CC-H And, Apollo, Houston. We notice you're still in FREE. Need to go back and make - reestablish the attitude. Go CMC AUTO.

11 17 44 ACDR You're there.

CC-H Okay.

11 19 04 ACDR Crip, have you got TV on there?

CC-H Tom, I don't - negative. We haven't started down-linking it yet. I'll let you know when we do.

ACDR Okay. We had a green light on, the one on panel 11. Yeah, we probably need to adjust the Polaroid on that, too - as of your directions.

CC-H Okay. As soon as we get a picture and I can talk you into it, we'll do it.

11 21 34 CMP I got both 181 and ... 808, Tom.

CC-H You were kind of garbled; say again, please.

11 24 41 CC-H Apollo, Houston. While we were in FREE there, we drifted a little out in pitch a little bit. We'd recommend going back to the previous nominal attitude that's in the Flight Plan at 45 hours, and probably it's still loaded so you can PRO through it in VERB 49. The attitude, if you don't have it, is 232, 04 - correction - 232, 034, and 000.

ACDR Okay. I got it, and we'll go back.

CC-H Okay. That's good, because this one is going to - it's okay now for comm, but it's going to be bad in a little while. Also, Tom, in about 5 minutes per the Flight Plan, we'll be turning on the down-link TV, and I'll let you know before we do that. And G&C has run the drift numbers from your P52, and, just another confidence factor, the drifts in IMU are so small, he can hardly see them.

Day 198

TAG Tape 198-04/T-22  
Page 5

11 25 40 ACDR Sounds great.  
CC-H Okay.

11 29 34 CC-H Apollo, Houston. In about 30 seconds, we're going to be turning on the TV downlink; and, incidentally, Tom, I've got an explanation of the green light.  
ACDR Okay. Go ahead.  
CC-H Okay. I guess I'll have to admit that I was a little bit confused on it, but the green light on a particular camera is on when two conditions are present. Number 1 is that that is the last camera or the camera that has been presently or last selected by the INCO, and number 2 is that the - that the ... CML or 2 - -  
CC-H Apollo, Houston. How do you read?

11 32 11 CC-H Apollo, Houston. How do you read?  
CC-H Apollo, Houston.  
CC-H Apollo, Houston.

11 34 58 CC-H Apollo, Houston. How do you read?  
ACDR Loud and clear.  
CC-H Okay, Tom. What happened there was when we switched over to television, we did not - we had a weak signal strength, and also the audio was not on the TV side of the downlink. What we'd like you to do is verify that only one camera is in MASTER and the others are in SLAVE, and also verify the - that the INTERLEAVER and TELEMETRY POWER switches on panel 400 are ON.

11 36 27 ACDR Hey, Dick, before I head for the DM, which one do we want in MASTER? Both of them are in SLAVE here in the CSM.  
CC-H Okay. We want the one plugged into CML as MASTER.

11 39 05 CC-H Apollo, Houston. The noise changed on the downlink. I just want to do a radio check with you.

USA Yeah. 5 by.

CC-H Apollo, Houston. How do you read?

USA ...

USA ...

USA ...

USA Okay, go ahead.

USA Go ahead.

11 42 14 CC-H Apollo, Houston. How do read?

CC-H Apollo, Houston.

ACDR Go ahead.

CC-H Tom, we dropped out there because for a minute we lost one of our voice lines. Could you verify that the - you've checked the two panel 400 switches and also that the 1 camera is now is MASTER and the other's SLAVE.

ACDR Roger. Panel 400 is squared away, and the one on CML that's in the tunnel here is on MASTER; all others are SLAVE and the DM closeout is in - taking place now.

CC-H Okay. Real fine, Tom. We're going to be switching back to the TV downlink mode and try that again; I'll be dropping out for about 30 seconds or so. I'll call you back.

ACDR All right.

11 44 04 CC-H And, Apollo, Houston. I'm told that I'm GO for voice again and I - we are getting a TV picture, and we probably can correct the Polaroid filter when you have time.

ACDR All right. Stand by.

CC-H Okay, Tom. Right now, it's a very dark picture.

CMP Okay. We'll rotate it, Dick, and let us know.

CC-H Okay. Why don't you give it a turn and then let us just look at it here for a second.

11 45 18 CC-H Apollo, Houston. I guess that direct - that direction on the Polaroid filter was okay, but we need to turn it some more.

ACDR How's that look?

ACDR Hang on, Dick. We're trying to get hatch 1 back up to the tunnel. We'll be jiggling the TV camera.

CC-H Okay, Tom. Understand you are messing with hatch 1. When you get back to that TV camera on panel 11, you might check the f-stop full open and that you're in AVERAGE. Because it is real dark.

11 50 51 ACDR Okay, Houston; Apollo. We've got hatch 1 closed locked and the PRESSURE EQUALIZATION valve CLOSED.

CC-H Okay, Tom. Thanks for letting us know. Back to that TV camera in panel 11, the - it's got a real dark picture. We'd like to check f-stop full open and AVERAGE.

ACDR Houston, are we over Russia now?

CC-H That's affirm. As a matter of fact, when we were - while you were messing with the hatch, we were - you just passed over the launch site. We saw a view of the Aral Sea and the coastline there. Reminded me of that airplane flight we took and that - now you're just about at the - about 52 degrees right at the highest point in latitude and west of the launch site over there by several hundred miles.

11 52 16 ACDR Okay. They got a forest fire on top of a mountain out here that you can sure see at this point.

CMP See some - a contrail, too.

CMP It looks like pretty rugged country - this part of the world right here - a lot of mountainous country.

CC-H Roger.



ACDR Dick, ... you're watching the TV out the window then?

CC-H Yeah. We had shifted to that - the window TV because the inside television was - the picture was so bad we weren't getting anything and - and INCO was just shifting back and forth while you were doing something else.

ACDR Rog. You have a pretty good picture on it - out the window?

11 53 06 CC-H We did on the out-the-window. We've - he's getting ready to get back to me here so we can adjust the inside one. Incidentally, I was telling you about the green light and I - I dropped out there. It turns out that the green light is on when the camera is selected and the power is on at the CMI or 2 station which are - what - whichever one is appropriate. But it's - it's that - it could be on when we were not downlinking TV, which was confusing me. So - so the CAP COMM will just be extra diligent in letting you know when we are downlinking.

ACDR All righty.

ACDR Okay. How's your picture now?

CMP Okay. How - -

CC-H I'm sorry; you all said something at the same time.

CMP On the average, how's it look now? And we're giving you all the light we can - f-stopwise.

CC-h Okay. Stand by just a second, please.

11 54 32 CC-H Apollo, Houston. Without window shades, I think this is going to be about as good as we can get it. We can see a lot of light from the - from those two windows, which is making the view pretty poor, but just for your information, in this position, the - that camera should always be in AVERAGE with f-stop full open. Maybe if you could tilt it down just a little bit maybe and get the two windows out of the field of view -

Day 198

CC-H Yeah. That's much better. When you get one of them out the - Tom, your window is still in the field of view a little bit.

11 55 10 ACDR Okay.

11 57 05 CC-H Apollo, Houston. We're 2 minutes from LOS ATS. Vanguard at 47; well, at - right at 48 hours. We'll see you down there.

DMP Okay, Crip. Or - whoever you are down there.

CC-H Roger. Whoever you are up there, Deke.

DMP Good comeback.

DMP We're in the middle of Constellation Orion here. We were so impressed we forgot what was going on.

CC-H Roger.

11 57 44 DMP Done.

END OF TAPE

Day 198

TAG Tape 198-05/T-23  
Time: 198:12:15 to 198:13:45  
Page 1

ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

12 20 26 CC-H Apollo, Houston. Hello at the Vanguard for almost 7 minutes and I've got three pads sitting here for you. We are going to update the NC2 final pad. That's the first one, page 1-12 when you're ready to copy.

CMP Okay, ready to copy.

CC-H Okay. Starting with NOUN 28. There's very minor change in this one. 048:31 four balls; minus 025.0, plus four balls, plus four balls; 340, 047, 359; 012.0; 00:01. Go ahead.

CMP NC2 final pad readback. 048:31 all balls; minus 025.0, plus all balls, plus all balls; 340, 047, 359; 012.0, 00:01.

CC-H Okay. Good readback, Vance. Same page, I want to correct the high-gain angles a little bit. The pitch should be minus 30, minus 30; yaw of 154 - 154. When you get those, if you'll turn back and read me down the P52 data, I'd appreciate it, then we'll get the other pads.

12 22 16 DMP Roger. P52. Okay, stars 33 and 42; NOUN 05 was five balls; NOUN 93, plus four balls 5, minus three balls 19, plus four balls 6; torqued at 47:47:30.

CC-H Okay, Vance. I copied and while you're there, would you give me the data from the COAS line-of-sight determination on the right side there.

CMP Roger. Shaft 359.59; trunnion 57.448.

CC-H Okay, Vance. Copy. If you'll turn two pages over, on page 1-14, I've got an NCC preliminary pad.

CMP Ready to copy, Dick.

CC-H Okay. 049:15 four balls; plus 034.6, minus 005.0, plus 004.6; 179, 036, 352; 022.3, 00:02; weight 32096; trims plus 0.69, minus 0.52; star check: star 37; 269.8; 31.2. Go ahead.

DMP Roger. Readback, NCC preliminary pad. 049:15  
all balls; plus 034.6, minus 005.0, plus 004.6; 179,  
036, 352; 022.3, 00:02. Weight, 32096; pitch trim,  
plus 0.69; yaw, minus 0.52; star check 37; 269.8;  
31.2.

CC-H Okay. Good readback. Turn the page again and I'll  
give you an NSR preliminary pad.

CMP Ready.

12 24 51 CC-H Okay. Starting with NOUN 81. Plus 012.5, minus  
002.9, minus 011.4; 189, 296, 350; 005.9, 00:01;  
0.6, 11.2. Weight, 31982; trims, plus 0.69, minus  
0.52; burn attitude checks, star 04; 175.9; 23.7.  
We've got a little over a minute until LOS. Go ahead  
with the readback.

CMP Okay. NSR preliminary readback. Plus 012.5, minus  
002.9, minus 011.4; 189, 296, 350; 005.9, 00:01;  
0.6, 11.2. Weight, 31982; plus 6 - plus 0.69, minus  
0.52, burn attitude, star 4; 175.9; 23.7.

CC-H Okay, Vance. You've got them all. They were good  
readbacks. The - we're about 30 seconds from LOS.  
The next acquisition is at the ATS, at about 48 plus  
22. So we'll see you there. You'll also notice on  
that NSR preliminary pad - that the delta- $V_C$  tailoff  
is 11.2. And that's what I was talking about earlier,  
about being less than 13.

CMP Yeah, okay. Thank you.

12 26 48 CC-H Okay. Real fine.

12 42 53 CC-H Apollo, Houston through the satellite. How do you  
read?

DMP Oh, 5 by. How do you read us, Dick?

CC-H Loud and clear, Deke.

DMP Okay.

12 45 12 CC-H Apollo, Houston.

ACDR Go ahead.

CC-H Tom, it looks to us - in looking at the CMC downlink that you've loaded your solution, and not the ground's solution, with regard to NOUN 81 delta-V's in the CMC, and we want to be sure and burn the ground solution. We can either go back through the prethrust program real fast and load the pad values, or talk about leaving some residual.

ACDR We'll go back and reload, even though we did it one time.

CC-H Okay. Why don't you go back through it again and check them and make sure that the delta-V's are loaded per the pad NOUN 81.

CMP Okay. We'll do P30. Okay?

CC-H Okay? Yes.

CC-H Yeah. And you'll reload P30 as you go through, if you need to.

12 46 31 CMP Okay, we got her in.

CC-H Okay, Vance. We're watching you as you go through the program.

CMP Okay, we're at attitude and ready.

CC-H Okay, Vance. Thanks a lot.

CMP Roger.

12 47 51 DMP Okay, they're all good.

12 48 50 CC-H Apollo, Houston. We are right with you, watching. The - the gimbal trim check looked real good to us.

ACDR Okay.

12 51 05 CMP Okay.

CMP Okay. Residuals plus four balls 10, and minus four balls 2.

CC-H Okay. Got it.

CMP Okay. It was a good burn. Burn jerked your TV camera around a little bit.

CC-H Okay.

CC-H And what was the delta- $V_C$  after the trim, please?

CMP Minus 12.9; on time and on attitude.

CC-H Okay. Real fine. Thanks, Vance.

12 52 05 CMP Good.

12 55 14 CMP 8 - RECEIVE, 5, T/R, full decrease; AUDIO, 5, T/R, full decrease; AM OFF, BACKUP -

12 56 55 CMP (Soyuz, Apollo. How do you read?)

12 57 11 CMP (Soyuz, Apollo. How do you read?)

13 00 18 MCC-H CAP COMM, INCO, MOCR 2.

13 00 45 CMP Houston, Apollo.

CC-H Go ahead.

CMP Okay, Dick; we've got Soyuz in the sextant.

CC-H Hey, super. Have you got a good view of him, Vance?

CMP He's just a speck right now.

CC-H Okay. As you know, we're really - we and the Moscow Control Center and a lot of other people listening are sure interested in how this rendezvous goes and how the ... gets closer, so just keep us advised.

ACDR Okay.

CMP Right now he's hard to distinguish from the stars, except the stars are moving relative to the background and he is not.

CC-H Roger that.

13 02 40 CC-H Apollo, Houston. We can see you beginning to take marks here. I've got a couple of minor checklist changes in the Rendezvous Book. They're over on page 1-18 and 1-19. If anybody's got time here at this - while we're kind of quiet, I'd like to go ahead and get them in. Page 1-18.

ACDR Go ahead.

CC-H Okay. Tom, they're - let me explain them to you first. They're additions to the VTR/DAC switch list over there on the right-hand side of the page. And the reason we're putting them in is to - that Santiago pass is going to be very short, and we're not sure INCO can get in a command. So what we want to do is to add to the VTR/DAC switch list. On panel 181, we want the TV SELECT to go to CM, and we want the CML, CM2 switch to go to CM2. And then I've got another correction on page 1-19.

ACDR All right. On panel 181, TV SELECT to COMMAND MODULE and CML, CM2 switch to CM. Over.

CC-H Roger, Tom. That's correct, and on page 1-19, also on the right side of the page on the VTR/TV switch list, panel 181, we want both the TV SELECT switch and the CML switch to UP TELEMETRY, center.

ACDR Okay. How about hitting that again, Dick, please.

CC-H Okay. Panel 181, TV SELECT switch to UP TELEMETRY, center. And also the CML, CM2 switch to UP TELEMETRY, center. And that's to be done at - in the VTR/TV switch list.

ACDR Okay. Readback on panel 181. TV SELECT UP TELEMETRY center and CML, CM2 UP TELEMETRY center.

CC-H That's correct, Tom. Thanks a lot.

13 05 10 CC-H Incidentally, Tom, during that last transmission, there was a - there was a big squeal and ...

DMP Soyuz, Apollo. (How do you read me?)

SFE Very well. Hello, everybody.

DMP (Hello, Valeriy. How are you?)

DMP (Good day, Valeriy.)

SFE How are you? (Good day.)

DMP (Excellent.)

13 05 42 SFE ...

DMP (I'm very happy. Good morning.)

CC-H Apollo, Houston. Didn't mean to cut out Deke there, but we - there was a loud squeal when I talked to you, Tom, last. We want to make sure that that - your speaker box is off; probably feedback.

SCDR Apollo, Soyuz. How do you read me?

DMP (Alexey, I hear you excellently. How do you read me?)

SCDR I read you loud and clear.

DMP (Good.)

ACDR Okay, Houston. Go ahead; you said there was a loud squeal.

CC-H Yeah, Tom. When I was talking to you before Deke and Alexey started talking, there was a loud squeal, feed - feedback when you were talking; I'm assuming that might be because - that your speaker box is still on and it ought to be off.

ACDR Okay. We'll check and see.

CC-H Okay. Super.

13 06 38 ACDR No - -

CC-H Why don't - -

ACDR The one on the docking module might possibly be, but this one's off.

CC-H Okay, Tom, and I didn't hear the squeal that time so we'll go as is.

ACDR Yeah, the one in the DM is on. That's right. But it shouldn't bother us here.

CC-H Okay.

13 07 11 DMP (Soyuz, Apollo. Ready to connect to VHF AM.)

USSR Okay. We're ready, Deke.

DMP Okay. (Soyuz, Apollo. VHF AM. How do you read?)



USSR ...

DMP (Repeat, please. I didn't hear you.)

USSR ... reading you ...

13 07 46 DMP (Fine.)

ACDR (I am trying.)

13 09 20 CC-H Apollo, Houston. At about 45 seconds per the Flight Plan, we're going to go to a TV downlink mode through the ATS, and so I'll be dropping out in about 30 seconds. I'll give you a call when we're locked back up.

ACDR Roger.

DMP Okay, Dick. And we've got good comm with Soyuz on AM.

CC-H Roger, Deke.

13 13 35 CC-H Apollo, Houston. We've got the TV picture now, Tom. And we're go for voice. How do you read?

ACDR Roger. I read you loud and clear. How me, Dick?

CC-H We still have that squeal. I'm not sure where it's feeding back, but I am reading you but with a squeal in the background. Also, if you have the time, I think it would - and you wouldn't mind putting a shade over that left-hand side window, to your left, it would sure help the TV - yeah, that one.

ACDR Like that?

CC-H Yeah. If you could - a window shade over that window would improve the TV tremendously.

DMP You know, Dick? We left the speaker box on up in the DM. I don't know whether that may be giving us the problem or not.

CC-H Okay. I - I think the squeal is primarily coming when Tom transmits. When you transmit, it's - I'm not sure we're hearing any, Deke.

DMP Okay.

13 14 56 DMP (Soyuz, this is Apollo. We are ready to begin comm check on VHF AM. Are you ready?)

DMP (Soyuz, this is Apollo. How do you read me on VHF AM?)

DMP (Soyuz, this is Apollo. How do you read?)

13 15 39 CC-H Apollo, Houston. One thing that you might check on the switches, Tom, about the squeal that's coming out of you, is the setup on panel 10. Make sure that the INTERCOM and the S BAND are both full decrease, since you're - you got an intertie to that panel.

ACDR Okay, checking. Both are decreased - -

CC-H Okay.

ACDR - - INTERCOM and S BAND.

CC-H Okay. Thanks, Tom.

ACDR Okay. Is there any squeal now?

CC-H It's - it sort of comes and goes. That time, I didn't think it was very bad at all. At - in - in any case, I can certainly hear you.

ACDR Okay. How do you read now, Houston?

CC-H I read that transmission loud and clear.

13 16 51 CC-H Apollo, Houston. I've got an NCC final pad when you can copy, page 1-14.

ACDR All right, I'm ready to copy.

CC-H Okay, Tom. Starting with NOUN 11. 049:15:04.80; plus 034.2, minus - -

ACDR Start all over, somebody was cutting us out.

CC-H Okay. I think they are. Stand by.

13 17 35 DMP (Excell - Good comm check on VHF FM.)

USSR I hear you loud and clear on VHF AM - -

DMP (... - -)

USSR - - I hear on VHF FM.

DMP (- - I will speak over VHF FM in 5 minutes.)

ACDR Houston. How do you read?

CC-H Apollo, Houston. Say again, please, Tom.

ACDR Okay. We were cut off by some interpret, some background line; go ahead and give me the whole pad again for NCC final, please.

CC-H Okay, Tom. I was waiting to see if we could find out where the problem was before I read it up to you. Maybe we could get clear comm, hang on just a second.

CC-H Tom, that interference is probably on VHF FM. On panel 9, if you'll turn down your FM volume to full decrease, you can probably - can get rid of it.

DMP Hey, Dick. It is ... turned mine off, and I still get it. It's not on AM either.

CC-H Okeydoke.

13 19 05 ACDR It's really bad, Dick.

CC-H Roger. Understand. Stand by.

ACDR Okay. It's cutting in and out. Try to get your transmissions in between it.

CC-H Okay. Let me go ahead and start again with NOUN 11. And I'll try to break it up. 049:15:04.80; plus 034.2, minus 004.3, plus 004.1; 179, 037, 353; 021.7, 00:02. Readback.

ACDR Roger. 049:15:04.80; plus 034.2, minus 004.3, plus 004.1; 179, 037, 353; 021.7, 00:02. Over.

CC-H Okay, Tom. Good readback. Turn the page. I've got a final NSR pad for you.

ACDR Go.

CC-H Okay. Starting with NOUN 81. Plus 013.0, minus 003.1, minus 013.6; 189, 299, 351; 006.1, 00:01; 0.80 - correction; delta-V<sub>c</sub> tailoff 13.0. Go ahead.

ACDR Okay. Plus 013.0, minus 003.1, minus 013.6; 189, 299, 351; 006.1, 00:01; 13.0. Over.

CC-H Okay, Tom. Let me make sure - let me read you the last two again - the delta- $V_C$  at ignition is 0.8, and the delta- $V_C$  tailoff is 13.0. Did you read those back?

ACDR Roger. 0.8 and 13.0.

CC-H Okay, Tom. Good readback both pads. Thank you.

ACDR Houston, Apollo. I think what's happening is you're getting feedback all the way through, back to Houston, and back up on S-band. I've got AM and FM both off.

13 22 20 CC-H Roger, Tom. Thanks, and we'll continue to look at it. When we figure it out, I'll get back to you.

ACDR Okay.

CC-H And, Apollo, Houston. We're going to be going out the TV downlink mode, I'll be dropping out about 30 seconds. I'll call you back.

13 22 39 ACDR Roger.

13 23 28 DMP Okay. (Soyuz, this is Apollo. I'm ready for comm check on VHF FM.)

USSR AM?

DMP (FM.)

USSR ...

DMP (Correct.)

DMP Okay. (Soyuz, this is Apollo. VHF FM. How do you read?)

USSR Apollo, Soyuz. I read you 3 by 3 on VHF FM.

DMP (All right. I heard you 4 by 4.)

13 24 16 CC-H Apollo, Houston. We're back up on the air-to-ground.

ACDR Okay.

USSR ... VHF FM.

Day 198

DMP (Alexey, I heard you poorly just now. Maybe we will be better in 5 minutes.)

USSR ...

13 26 19 ACDR (Soyuz, this is Apollo. I hear you excellently.)

USSR ...

ACDR (We, too. We hear you excellently on the VHF AM and we'll try on VHF FM.)

CC-H Apollo, Houston. We're going to ... and drop out about 30 seconds, I'll call you back.

CC-H Apollo, Houston. We're back up on the air-to-ground.

CMP Roger.

13 27 02 CC-H And, also, if anybody has a chance, on page 1-15, I've got an update of the high-gain angles.

ACDR Okay, go ahead, Dick.

CC-H Okay. Left side of the page, down at the bottom, pitch, minus 05; yaw, 314.

CMP And we've got good agreement taking the CMC solution.

CC-H Good show.

ACDR Okay. Pitch, minus 05; yaw, 314.

USSR Soyuz, Soyuz, Deke or Tom?

DMP (Good, Soyuz.)

13 30 01 CC-H Apollo, Houston. We're a couple of minutes from ATS LOS. ... drop out just a short time, and we'll call you at Guam.

ACDR Okay.

USSR (They're playing - too much. Good. They're playing ...)

13 31 50 ACDR Houston, Apollo. How do you read?

CC-H Loud and clear, Tom. We're close - about 30 seconds from LOS ATS. Go ahead.

ACDR        Okay. We're getting up to 3 minutes to the burn.  
Recheck ... read me back through your S-band.

CC-H        Okay. I copied that. We're not real sure, it's  
probably some configuration problem we got, but we'll  
find it.

13 32 17    ACDR        All right.

13 35 17    CC-H        Apollo, Houston. Guam for 6 minutes.

CMP/ACDR    Roger, Dick.

DMP        (Soyuz, this is Apollo.)

DMP        (Soyuz, this is Apollo.)

DMP        (Soyuz, this is Apollo.)

CC-H        And, Apollo, Houston. When you guys get squared away,  
stand by for burn status report.

CMP        Roger.

DMP        (Soyuz, this is Apollo. How do you read?)

13 36 52    ACDR        Houston. How do you read?

CC-H        Loud and clear, Tom.

ACDR        Okay. Burn was on time. Burn status was - -

CMP        Okay - -

ACDR        - - minus 1, minus 1 - -

CMP        Right. Minus four balls 1, minus four balls 1, minus  
four balls 1. The EMS was set at 23.0 for G&N  
solution and was turned out to 13.2 and it was on  
time, on attitude.

CC-H        Okay, Vance. Copy.

DMP        (Soyuz, this is Apollo. How do you read?)

13 37 25    USSR        Very well. How do you read me?

DMP        (Very good, Valeriy. The MCC complete. Turn on your  
ranging, please.)

DMP Okay. (Soyuz, this is Apollo. Ranging now established. 120 miles.)

USSR I read well. Range is 101 mile.

USSR 12 miles.

CMP (Valeriy, we've seen you through the sextant a long time ago.)

USSR Roger.

ACDR Okay, Dick. We locked on them on ranging at about 120.40 miles.

CC-H Okay, Tom. Thanks a lot for letting us know.

DMP (Soyuz, this is Apollo. Turn on your ranging. How do you read?)

USSR Say again, please. I did not understand you.

DMP (Yes. I'm talking about ranging. How do you read?)

DMP (Soyuz, Apollo. How do you read?)

USSR I read you badly. 3 by 3.

13 40 20 DMP (Roger. Understand.)

DMP (Talking on the ranging.)

CC-H Apollo, Houston. If someone is over - -

USSR ... RANGING, OFF.

CC-H - - close to panel 3, I'd like one switch thrown.

13 40 33 ACDR Go ahead, Houston.

CC-H On panel 3, I'd like the S BAND NORMAL POWER AMP switch to LOW.

ACDR Okay. You got it, Dick.

CC-H Okay, and we're about 30 seconds from LOS. I'll give you a call coming up at Santiago at 49:52. See you there.

DMP        Okay. And we've completed all of our comm checks with Soyuz. The ranging isn't the greatest, but we're getting their ranging data.

13 40 57    CC-H        Roger, Deke. Thanks.

MCC-H       CAP COMM, INCO, MOCR 2.

END OF TAPE



Day 198

TAG Tape 198-06/T-24  
Time: 198:13:45 to 198:15:15  
Page 1

ASTP AIR-TO-GROUND VOICE TRANSCRIPTION

14 12 30 CC-H Apollo, Houston. Standing by.

ACDR (Soyuz, this is Apollo. NSR completed.)

CMP Okay, Houston; this is Apollo. We just finished NSR. Residuals were all balls, plus all balls 1, minus all balls 1. EMS is reading minus 12.8; we shut it up on the G&N. And we burned the G&N ... solution; good attitude and on time. And we'd like to report that we could see Soyuz through the sextant shortly after NCC.

CC-H Okay, Vance. Would you read me the residuals again? I only copied two of them. If you'll give me those again, I'll have it all.

ACDR Roger. ATT, 0; Y, minus 1; Z, plus 1. Over.

CC-H Okay, Tom. Thanks a lot.

CMP Okay. ...

CC-H Apollo, Houston for Tom, when - Apollo, Houston for Tom, when he has a chance.

ACDR Go ahead.

14 14 20 CC-H Okay, Tom. Talk about the RCS budget here for a minute. You're looking - we're right on the nominal; you've got plenty of gas. In case you do have any problems, remember the PSM goes empty when it's reading about 7 percent, and the redline on RCS for the quads is 35 percent.

ACDR Understand, Dick.

CC-H Roger. And, Vance, I cut you out. Go ahead.

CMP Roger. I don't know if you've been using the TV camera and station at 11 - at stage 11, but every time we make a burn, why it acts just like it suddenly is dropping to the floor. It turns sideways, and we have to reset it each time.

CC-H Roger, Vance. Understand.

14 15 22 DMP (Soyuz, this is Apollo. NSR completed.)  
SCDR I don't understand you, Deke.  
DMP (Maneuver NSR completed.)  
SCDR NSR completed?  
DMP Roger.  
ACDR Houston, Apollo. Do you have any different angles for the ATS than what we - is in the Flight Plan?  
CC-H Yes. The - the pitch is minus 05; yaw, 314. I read them up but maybe get - they got in another book. Minus 5 and 0 - and 314, Tom.  
ACDR Okay.  
DMP ..., Dick, and it's - and it's set up that way.

14 16 01 CC-H Okay. Super.

14 16 08 CMP (Alexey, ... 57.)  
SCDR A range of 18 - 8 miles.  
CC-H Apollo, Houston. We may have a short dropout between Santiago and ATS, but if we do, we'll see you on the ATS.

14 17 11 CC-H Apollo, Houston through the satellite. How do you read?  
CMP 5 by, Dick.  
CC-H Okay. Incidentally, on the comm, we have rechecked our configurations on the ground; they're all - they're correct now. If the problem of the comm interference happens again, one thing you might try is to turn OFF the PHONE MIC INTERCONNECT [sic] switch on panel 10 and see if that cuts it out; and let us - and then let us know about it. We'll continue to work the problem.  
CMP Okay; we haven't heard it lately, Dick.

Day 198

CC-H Okay. I'm hoping we have it corrected.

14 19 42 MCC-H CAP COMM, INCO, MOCR 2.

14 29 01 CC-H Apollo, Houston. Per the Flight Plan, we're going to be switching over to TV mode, so I'll be dropping out for a few seconds. I'll call you back.

ACDR Okay.

CC-H Apollo, Houston through the satellite again. How do you read?

DMP 5 by, Dick.

CC-H Roger. And I had one question for Vance in regard to the NSR burn, if he happens to remember it. Vance, do you remember what you loaded prior to the burn in that EMS for delta-V?

CMP Stand by 1.

CC-H Okay. It's - it's not something that you were - that you normally would have written down in the Rendezvous Book. And if you don't remember it, don't worry about it.

CMP Little delta-V - -

ACDR Minus 13.

CMP - - minus 13; and it strikes us that it was 9.8, but I'm sure it was 9 something.

14 31 39 CC-H Okay. Copy. Thank you much.

CC-H Apollo, Houston. We've got television downlinking again. We still have a light problem. Looks like when we readjust the TV camera after the SPS burn, we may need to readjust the polarizing filter, and also, that hatch 3 window is drowning out a lot at the top. If you'd have time to put a cover over that, if you could stand to do that, we'd appreciate it.

ACDR Okay. Stand by. We're in the middle of a snack period now. We'll take a look. I don't want to

knock out too much light coming up for rendezvous from the overhead, but we'll take a look at it.

CC-H Okay; we don't either. You do what's necessary. Just thought we'd let you know what the picture looked like.

ACDR Okay. Side window doesn't hurt us a bit over here.

CC-H Okay.

14 35 34 DMP Besides the window, TV working down there, Dick?

14 35 39 CC-H Roger, Deke. I think what we're seeing is all ocean. Well, I guess we're seeing the African coast now coming up, and it does look good to me.

DMP Okay. It looks great from here. I didn't know whether you were seeing it that well or not.

CC-H Yeah, it just came into view. When you first asked me, all I was seeing was water, and I couldn't tell whether that was water or - or nothing.

DMP Okay; and I'll ... it over there a little bit.

CMP Marking is going real smooth, Dick. The computer seems to really know where we are.

CC-H Good show. I'm glad to hear that, and I've got a TPI preliminary pad when somebody can copy on page 1-17.

DMP Okay. Stand by a second.

CC-H Okay. Whenever you have a chance.

DMP Okay. Go ahead, Dick.

CC-H I'm sorry; you were cut out by somebody in here. Are you ready to copy?

DMP Roger. Ready to copy.

14 37 16 CC-H Okay. Starting with NOUN 37: 050:56:42.61; plus 19.4, plus 00.6, minus 10.3; plus 21.9/57, plus 00.6/04, minus 00.3/01; 008.9, 00:01; 359, 021, 000; 3.6,

13.0. And let me correct one. I think I read the NOUN 22 yaw incorrectly. It should read 001. Why don't you go ahead and read that back?

DMP Okay. 050:56:42.61; plus 19.4, plus 00.6, minus 10.3; plus 21.9/57, plus 00.6/04, minus 00.3/01; 008.9, 00:01; 359. Okay; and I changed the next one. What's that, Tom?

ACDR Yeah, okay. That's 021, and that's 001; and 3.6. And ... 21.

CC-H Roger. That was a good readback. I didn't copy the last number, which should be 13.0.

DMP Rog. 13.0.

CC-H Okay; and the weight - -

DMP We're getting all that racket again, Dick, and we're missing some of your transmission.

14 39 29 CC-H Roger. I'm hearing it, too. The weight - I'll try to get in between it. The weight is 31914. And the trims: plus 0.62, minus 0.47. Go ahead.

DMP Okay. Weight is 31914; plus 0.62, minus 0.47.

CC-H Roger. And the docking attitude pad on the next page is nominal; no changes.

ACDR Hey, Dick?

CC-H Go ahead, Tom.

ACDR Hello, Houston.

USSR ...

ACDR Okay. Relay through Moscow to Soyuz that every time somebody comes on with a - a various transmission, our range is busting lock. Over.

14 40 12 CC-H Roger. We will do that. Thank you.

14 40 18 ACDR (Soyuz, this is Apollo.)

CC-H Apollo, Houston. While it's quiet. It was obvious to us that during all the noise there, that what we were hearing here was some sort of VHF tower interference - some control coming across Europe. And, Apollo, Houston. Tom, if - I saw you trying to transmit. I didn't here that. I - I was watching TV.

14 42 18 CC-H Tom, Houston. How do you read? Okay, Tom, Houston. I can see that you are reading me, but you're not transmitting down. We'll look at the problem. I can - I can see you are reaching for the mike on the TV. I know you're hearing me, but I'm not hearing you. I understand.

ACDR Our VHF keeps breaking lock.

CC-H Roger. I understand, Tom.

ACDR Okay, Dick. We must have got out of the area there where all the transmissions - we could hear it both in French and English and a little bit of Russian. Our tracker - our VHF is locked on good now.

CC-H Okay. I hope it stays that way, and I read that transmission loud and clear from you.

ACDR Okay; and the - the docking attitude pad. Is that going to be nominal?

CC-H That's affirm. It is nominal.

ACDR Okay. I couldn't hear you when this other stuff came through.

14 44 52 CC-H Okay.

CC-M (Moscow, Soyuz. How do you read me?)

14 47 05 CC-H Apollo, Houston. We're going to delete the downlink TV and go back to the air-to-ground voice mode.

ACDR Okay.

SCDR Apollo, Soyuz. What is the range now?

ACDR (Right now, 48 miles.)

SCDR 48 miles.

14 49 20 SFE Okay; I'm GO on docking; on time.

ACDR (Okay, Roger. I understand you. GO for docking.)

USSR ...

CC-H Apollo, Houston. When you have time to top - copy, Tom, I've got a final TPI pad.

ACDR Okay. Stand by. I'll be ...

CC-H Okay.

ACDR Okay. Go ahead. Ready to copy.

CC-H Okay. Starting with NOUN 37: 050:59:43.48; plus 18.7, plus 01.1, minus 11.9; plus 22.0/57, plus 01.2/08, minus 02.1/10; 009.2, 00:01; 358, 013, 002; 3.9, 13.0. Go ahead.

ACDR All right, on the readback: 050:59:43.48; plus 18.7, plus 01.1, minus 11.9; plus 22.0/57, plus 01.2/08, minus 02.1/10; 009.2, 00:01; 358, 013, 002; 3.9, 13.0. Over.

CC-H Roger, Tom. That was a good readback. And, Tom, Houston. Be advised we have confirmed for sure that the interference here you've been hearing is interference from ground station. That last voice that was interfering just a few minutes ago was interpreted, and it was a weather bulletin being - putting out. Must have been Moscow Metereo.

ACDR Okay. Thank you. The weather's pretty clear up here.

14 53 02 CC-H Roger.

14 55 56 CMP Hey, Dick, did you ...

CC-H That's affirm, Vance. We did.

CMP (Soyuz, this is Apollo.)

14 58 34 SCDR ... How do you read me?

ACDR (We read you well. Soyuz, this is Apollo. We now see your beacon. Some minutes ago.)

SCDR Soyuz beacon on.

ACDR (All right, I see it now.)

14 58 59 SCDR Thank you very much.

15 05 36 CC-H Apollo, Houston. Tom, when you get a second, like to just talk about the various solutions as they are coming up.

ACDR Okay. You saw our  $T_{ig}$  time: 50:56.

CC-H That's right, Tom. Just wanted to say a couple of words. We think you're doing real fine onboard. Both the  $T_{ig}$ s are slipping in the - the same direction. There is a difference between the pad  $T_{ig}$  and the - and your onboard  $T_{ig}$ . Another thing I wanted to say was if it did turn out that ours was correct, but you - because of the loading limits - you burned yours, the first midcourse could be in the area of X about 9 and Z about 15 feet per second; and - and we wouldn't be surprised at that. We don't think ours is right; we think your onboard  $T_{ig}$  is right, so we don't think you have any problem at all.

CMP Understand.

CC-H Okay, Vance. We still have about 3 minutes here until LOS. I'll just make this LOS call from ATS and give you a call when we come up at Santiago at 51:26. See you there.

CMP Righto.

CC-H Okay.

ACDR Do we still have contact, Dick? You can read that. It looks like we agree right on. At X, we're within, oh, a half - about 1 foot per second - no, a half a foot per second; Y, within a little over 1; and Z. So we're right on. The times are there. We're - we're home.



CC-H Roger. We're confident the way you are, Tom. Also, one thing before we go over the hill here. After we get ATS on this next pass and if this interference comes up and it's bothering you, let me let you know that it's not bothering me too much so don't worry about me. But if it's bothering you so much you - we think probably you could get rid of it onboard by - on panel 10, going PHONE/MIC INTERCONNECT [sic] to OFF, and then whoever's being bugged on their audio panel, turn his VHF FM and AM either OFF or VOLUME, full decrease.

ACDR Okay.

15 08 12 CC-H But I can put up with it; I - I'm - it's easy for me to get in and out between the interference.

END OF TAPE