

ASTP ONBOARD VOICE TRANSCRIPTION

RECORDED ON THE COMMAND MODULE
DATA STORAGE EQUIPMENT RECORDER

PREPARED BY
TEST DIVISION
PROGRAM OPERATIONS OFFICE



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

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INTRODUCTION

This document is the transcription of the Apollo-Soyuz Test Project (ASTP) voice communications as recorded on the command module data storage equipment (DSE). Data from this recorder are telemetered (dumped) to Space Tracking and Data Network (STDN) sites for retransmission to the Johnson Space Center. The transcript is divided into three columns — time, speaker, and text. The Greenwich mean time (GMT) column consists of three two-digit numbers representing hours, minutes, and seconds (e.g., 22 34 14) for the Julian dates shown at the top of the page on which a new day begins. 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

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 <u>New Orleans</u>
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

20 11 19 CC-H ... And ARIA is going to come up in about 55 minutes
so we'll see you then.

ACDR Okay.

DMP Okay. And let's take a quick look at CMs on 181
there, Vance.

CMP Okay. Let's see.

ACDR ... flight time.

DMP Okay. CM, panel 181.

20 11 45 CMP Yeah. CM 1 POWER, OFF.

20 11 47 DMP Okay. Stand by till I get you that.

CMP Okay. You know, they didn't pack this bag with ...

DMP Understandable, I guess.

20 12 06 CMP Okay. Now, repeat what you want on 18 ...

DMP CM 1 TV STATION POWER, OFF.

20 12 15 CMP Okay; it's OFF.

20 12 16 DMP Okay. TAPE RECORDER, I get that. Then on 400.

CMP All right.

DMP HEAD WHEEL DRIVE MOTOR, ON. Light on?

20 12 25 CMP Okay; ON.

DMP TAPE DRIVE, REWIND.

20 12 29 DMP REWIND.

DMP Okay. Now, 226, circuit breaker COAS/TUNNEL LIGHT-
ING MAIN B ...

CMP Say that one again.

DMP ...

CMP Yeah, I think I can. You see, the tunnel ...

DMP Yeah.

CMP Okay.

CMP Okay. Now say what it is again.

DMP On 226. Circuit breaker COAS/TUNNEL LIGHTING, MAIN B, CLOSED.

20 12 55 CMP CLOSED.

DMP Okay, then 230, OMNI, UP ..., I think. And 74 [sic].

CMP Let her go.

DMP SERVICE MODULE RCS QUAD HEATER A, SECONDARY.

20 13 10 CMP QUAD - QUAD HEATER light is ... HEATER A, SECONDARY.

DMP HEATERS B, C, D TO PRIMARY.

20 13 16 CMP All right that's done.

DMP Okay.

CMP But we still have to get 230.

DMP I'll get the 230 OMNI.

DMP Okay. Then. I got to stow the panel ... the circuit breakers ...

CMP Okay.

DMP Strut unlock lanyard, stow; unstow tool E - -

CMP Hey, yeah, just a second. Sometime - I guess maybe we ought to verify - -

DMP The S-IVB.

CMP - - these things.

DMP Yeah. I'm - I'm not ..., lanyard ... I'm not ...

DMP Yeah, the S-IVB ...

CMP Okay.

ACDR I'll get it.

DMP Tom, did you set up the COAS? Do you need the DAC?

CMP Do we need tool E yet?

ACDR I'll leave it there.

DMP ...

CMP We need you to set up the ORDEAL, Tom.

ACDR Yeah. ... I got ...

DMP Go ahead.

ACDR Already got my altitude set in, about ... average.

DMP Okay.

ACDR You got it? You got ... here?

CMP Okay. We've got it in ... And, ..., right?

ACDR Yeah. But we got to put us some tape on here.

20 14 42 CMP Okay; and we lost the telescope cover.

ACDR We're in good shape.

ACDR Okay; I ... do a VERB ...

CMP Okay. You need the tool E, Tom.

ACDR No, I don't.

CMP Okay. I'll leave it there, then.

DMP Stow - You're getting all this stow actuator for ...

DMP ... Yeah. I'll get that in a minute here. I was going ...

DMP ...

CMP Okay.

20 15 20 DMP The S-IVB's ... up to the vertical now.

CMP So that's the story.

DMP Yeah. It's sitting ... now.

MS (Laughter)

CMP ...

DMP Let me see, I got - I got the ORDEAL ballpark set up.

CMP Okay. Well, I'll wait for it.

DMP Better twist it around the other way.

CMP Okay. ...

DMP ...

ACDR Yeah.

20 15 41 CMP You know what's funny, seeing those optics coverers go.

DMP Yeah.

CMP I saw them leave and that was black and I thought they hadn't really gone.

DMP/ACDR Okay.

CMP Ready for the docking probe.

12 15 52 DMP Breakers are IN.

CMP Okay. I'll go EXTEND/RELEASE until full probe.

DMP Okay.

ACDR Got a barber pole. Okay, hold about 5 seconds ...

DMP Okay, then it says, just go full PROBE EXTEND ...

CMP Okay. Probe gray at full extension. Right.

DMP Yeah.

12 16 17 CMP ... gray ... Now, when you're through go to RETRACT.

DMP Okay.

CMP Okay. Next - next is going to be a MAIN REG check, and I can get down there to help out for that.

DMP Okay.

CMP Then I'll do my P52.

ACDR All right.

CMP What time is it? It's 26, I can start that at 35.

ACDR ... along here, right?

DMP What?

ACDR I think ... everything on EXTEND PROBE.

DMP Okay.

CMP Yeah.

ACDR ... anything now?

CMP Yeah.

ACDR Okay.

DMP Get down there, let me ...

CMP Okay; go.

DMP Okay; ... MAIN REG B valve, CLOSED.

20 17 01 CMP B, CLOSED.

DMP EMERGENCY CABIN PRESSURE, select 1.

20 17 02 CMP 1.

DMP Test pushbutton, push.

20 17 04 CMP All right, here it comes.

DMP Okay. There you go ... Okay.

CMP All right.

DMP Okay. MAIN REG B valve, OPEN.

20 17 17 CMP OPEN.

DMP MAIN REG A valve, CLOSED.

20 17 20 CMP A, CLOSED.

DMP PRESSURE select 2.

20 17 22 CMP 2.

DMP Push to test.

20 17 24 CMP Push to test.

DMP Got that one?

CMP Yeah.

DMP MAIN REG A valve, OPEN.

20 17 30 CMP OPEN.

DMP CABIN PRESSURE select, BOTH.

20 17 47 CMP BOTH.

DMP ... that one.

CMP Okay. Anything else down there.

DMP Okay. Let me see here.

ACDR Vance, while you're there you can hand me the DAC.
I'll just put it ...

CMP All right.

DMP Okay. ... is monitoring okay.

CMP Right.

DMP Okay. And we need, on 377 - let's try - how do
you ... that.

CMP ... Hey, move your feet, Tom, I'll try to get it.

ACDR - if I can get it without moving my feet, here.

DMP Got it.

ACDR Now, get your camera gear.

CMP Okay.

DMP Okay. Let's get on to 377, Tom.

ACDR Okay. ... the flashlight.

CMP I think I'll just give you these three to begin with, Tom. Unless you want me to ... - -

ACDR Yeah. Oh, no. ... find it here. 377?

CMP 377.

ACDR Yeah, hang on.

20 18 55 ACDR Okay. I got ...

DMP Okay. Go ... GLYCOL, NORM - clockwise.

20 19 01 ACDR Go clockwise?

DMP That's right, 30 seconds.

ACDR Okay. How ... clockwise.

DMP Go ...

ACDR I don't have any I don't need.

DMP Hang on, let me - Found a little washer floating by here.

20 19 22 CMP Yeah. Okay, we need the 25-millimeter lens ...

DMP Do we? ...

ACDR Okay, Deke. Suppose to go which way?

DMP Clockwise, NORMAL.

20 19 30 ACDR Okay, clockwise ...

DMP ... then BYPASS, counterclockwise.

ACDR Yeah.

CMP Deke, I'm going to take the little portable timer and put it down here.

DMP Okay.

CMP If you ever need it, it'll be down here, right next to the optics on the left.

DMP Okay, ... BYPASS ...

20 20 02 ACDR BYPASS, counterclockwise. Okay.

DMP ...

CMP Okay, Deke, would you hold this for Tom?

DMP Okay. I'll be around there in just a second. Let me put this washer in my pocket.

DMP Okay. What do you want me to hold?

ACDR ...

CMP ... coming back.

DMP ...

CMP Tom, I've got to get by you.

ACDR Yeah. All right.

CMP ... Okay.

20 20 39 CMP Okay. We got the DAC stuff out, Tom.

ACDR All right. Good. Now - -

DMP Where you going?

ACDR - - the only thing - ... come around in through here. See if we can make it here. Okay. We should be ...

ACDR It's as bad in this thing as if we ... on the ground.

CMP What's that?

ACDR ...

CMP (Laughter) Is it really?

ACDR Yeah. Got to get down there and get the couches ...
Okay. Ready.

CMP ...

20 21 50 CMP Let's see. Where did we - Oh, yeah. I know where
the tape is.

DMP Yeah. I got extra tapes ...

ACDR Well, oh boy, ... it's one of the most important
things we got.

DMP Here, I got one more under the couch here.

CMP Let's see - -

DMP Here it is back here.

ACDR Okay. That looks good.

CMP Why don't we -

ACDR Who wants some tape? I got some right here.

20 22 28 CMP Yeah. Just a second. This ... just came off.

DMP It cuts off by itself.

DMP Just a minute, that - tape is in there.

CMP Yeah. Okay. Can you give me just two pieces, Tom?

ACDR Okay. In work.

CMP Is it still daylight out?

ACDR Oh, no. We're not ...

DMP ... tape.

ACDR I got - I got it. ... mine. Vance, ... a piece of
tape.

CMP Okay. Thanks.

ACDR Need another one.

CMP Yeah.

DMP Okay; now then. Let me see, ... went off. ...

ACDR Yeah.

CMP Boy, it does take a little dark adapting.

ACDR Okay. ... some lights down there.

20 23 56 DMP Okay; P52.

CMP Okay. Tom, I'm just about to get a ...

ACDR Oh you are. You're working on that ... then.

CMP Yes.

ACDR Okay.

CMP I think it was coming about now. Right about 35.

ACDR 35. Yeah.

20 24 18 CMP Okay; that was star 27, Alkaid; 43 coming next.
Damn it.

ACDR ...

DMP No. We hold up until - -

20 24 57 CMP Okay. There's - That should do it. Okay. All balls.
Here's your NOUN 93, ready to copy.

ACDR NOUN 93: minus 36, minus 1, and plus 137. Okay,
and that's the SCS [?].

CMP Okay, are you still SCS [?]?

ACDR Oh yeah. ...

20 25 19 CMP Okay. ... torquing now at 20 - 35:20.

ACDR Okay. Got that.

DMP Tom, ready to start EMS ...?

ACDR All right.

DMP EMS MODE to STANDBY.

20 25 46 ACDR Yeah.

DMP EMS FUNCTION ...

20 25 50 ACDR Roger.

DMP ...

20 25 54 CMP Okay, and we got a good check on the star.

20 26 10 ACDR 1586.8. Got it.

DMP EMS MODE, NORMAL.

20 26 14 ACDR NORMAL.

DMP Okay. DELTA-V TEST.

20 26 16 ACDR TEST.

DMP Okay. ... on/off.

CMP We're down to 351 and ... even.

DMP Okay. ...

20 26 30 ACDR ... We're at minus 10.5, Deke.

DMP Okay. EMS MODE, STANDBY

20 26 40 ACDR Yeah.

DMP EMS FUNCTION DELTA-V ...

20 26 43 ACDR Yeah.

DMP Set DELTA-V indicator to minus - -

CMP Oh, Tom.

ACDR Yeah.

CMP I need tool E again.

ACDR All right. Stand by. Here it is.

CMP ...

ACDR Right here, Vance.

CMP Got it.

ACDR There you go.

DMP Okay.

20 27 05 CMP Okay, the POTABLE LANK - TANK INLET you want verified OPEN?

DMP Verify it is OPEN, counterclockwise.

20 27 10 CMP Verified.

DMP Okay on 326.

CMP Yeah.

DMP GLYCOL RESERVOIR BYPASS valve, OPEN.

20 27 17 CMP GLYCOL RESERVOIR BYPASS, OPEN.

DMP Counterclockwise.

CMP Go.

DMP GLYCOL RESERVOIR OUT valve, CLOSED, clockwise.

20 27 24 CMP CLOSED.

DMP GLYCOL RESERVOIR IN valve, CLOSED, clockwise.

20 27 27 CMP CLOSED.

DMP PRIMARY ...

CMP Anything else down here? ...

DMP ...

DMP Okay. 379 shouldn't be bad.

ACDR That's right.

DMP PRIMARY ACCUMULATOR FILL valve, ON, counterclockwise.

ACDR Yeah. Oh wait. Vance, hand me that.

CMP Oh. You need the tool E again? Down to the left there.

DMP I think that fell down in there ...

CMP All right. ...

ACDR Okay; want to go to DELTA-V and NORMAL on that EMS test.

DMP Yeah, we stopped there. Go to DELTA-V and NORMAL, right.

ACDR Okay; I'm going to 379.

DMP Okay.

20 28 17 ACDR Okay. ... clockwise.

DMP Actually, I don't know whether we ought to do that, Tom, because ... 40 to 55 percent and we're at 45 now.

ACDR I don't either.

DMP Let's leave it alone.

ACDR Forget it.

DMP Okay; ECS RAD FLOW CONTROL, POWER. ...

20 28 38 ACDR Okay.

DMP PRIMARY GLYCOL to RAD; valve normal, push.

20 28 42 ACDR All right. Normal, push. Okay, in work.

DMP And RAD TEMP PRIMARY. ...

DMP ... Okay, talkback is gray.

CMP And - Okay.
 20 29 06 DMP GLYCOL EVAP TEMP IN, AUTO.
 20 29 08 CMP GLYCOL EVAP ... AUTO.
 20 29 12 DMP POTABLE H₂O HEATER, MAIN A.
 CMP MAIN A, POTABLE HEATER.
 DMP Circuit breaker - circuit breaker ... DUMP 2, CLOSED.
 CMP ...
 DMP Yeah. ...
 ACDR Yeah, yeah. Think that's what it is.
 DMP Okay. Vance, do we have that ... going to OFF? ...
 CMP All right. ... STANDBY on that one, and ...
 DMP Okay, the next thing we got, it says purge burn.
 CMP Okay. Ready.
 DMP RCS transfer to service module.
 20 29 57 CMP Okay, transfer to service module.
 DMP POWER NORMAL 1, OFF. Verify.
 ACDR ...
 CMP Okay. Say that one again.
 DMP RHC POWER NORMAL 1, OFF. Verify. And 2, OFF.
 CMP Okay. That's one for Tom. You got the NORMALs off there, Tom?
 ACDR Say again.
 DMP RHC power normal. 1 - Verify 1, OFF and 2, OFF.
 20 30 19 ACDR NORMAL 1, OFF, and 2, OFF, verified.
 DMP RHC POWER DIRECT, 1 and 2, MAIN A and B.

20 30 24 ACDR 1, 2.
DMP Okay, RHCs 1 and 2, ARMED.

20 30 28 ACDR ARMED.
DMP Okay, simultaneously command plus and minus, using hard stops. Plus or minus roll for 3 seconds.
CMP Okay, that'll come first.

20 30 40 CMP Okay, Deke. Plus or minus pitch, 1 second.
DMP Okay; then RHC 1 and 2, LOCKED.

20 30 58 CMP LOCKED.
DMP RHC POWER, NORMAL - NORMAL 2, AC/DC; RHC POWER DIRECT 1 and 2, OFF.

20 31 05 CMP Off, Deke.
DMP That's all of that.
CMP Okay. What next? RCS check, I'll bet.
CMP Oh, I better get down and get this damn camera ...
CMP Tom, have you got the DAC set up?
ACDR I have the DAC, it's all set. Let me have the ...
CMP Why don't you take it and tell me what you get, okay? Is that okay?
ACDR Okay.
ACDR CM RCS. Okay. Unstow the DAC, 25-millimeter lens. You got that?
CMP Okay.
ACDR ... select Hasselblad. 50-millimeter lens, RHC.
CMP It says the reflex. That's the - -
ACDR Okay. ... than that.

CMP That's the - -

ACDR ...

CMP Yeah, panel - -

ACDR I don't know.

CMP Okay, is that in the - B-5?

ACDR B-5.

CMP Let me get that last. I rather get the TV next.

ACDR All right. All right.

CMP Because we need that worse.

CMP Okay; how about the TV?

ACDR The TV, B-5?

CMP Yeah.

ACDR TV CM-4, TV zoom.

CMP Okay; let's do one thing at a time.

DMP Do you have everything up to ...?

ACDR I don't know. ... here.

20 32 52 CMP Okay, Tom.

ACDR Okay.

CMP Now, one at a time.

20 32 56 ACDR CM-4.

CMP What's that? Oh, that's a window.

ACDR Okay. ... the TV, you need the zoom lens, the monitor.

CMP All right, stand by; I'm going to hand these things to you.

ACDR I'll put them in here. Two cables and a U-mount.

CMP Okay, it's really interesting.

ACDR Assemble the U-mount and the cable on the camera ...

CMP Let me get - I got - I'm going to have everything on a string here, if I'm lucky.

ACDR All right. I got - I've got to go put a shade up.

CMP Isn't this something?

ACDR ... this God damned circuit breaker ...

DMP Okay, Tom?

ACDR Okay.

DMP I'll put that stuff back in a minute.

20 33 56 ACDR All right, I'll start getting it out.

DMP Boy, am I glad to see ...

ACDR Yeah.

CMP It'd be all over the place here.

CMP Okay. Now can I help you, Tom?

ACDR ... Yeah.

CMP Now I can take that and start handing it to you.

ACDR All righty. First the camera - ... camera.

CMP ... Okay, here's the camera.

ACDR Okay. Can you get me the lens out of here, Vance?

CMP Yep.

ACDR Here's the bag.

CMP Here's the lens.

ACDR Okay, now ...

CMP Let me get all these bags ...

20 35 45 CMP You want me to get these out of your way?

ACDR Okay. Let me have the lens. ...

CMP Tell me what you need next.

ACDR Okay, get those - start getting those cables out of there.

CMP Okay, here's the monitor cable.

ACDR ... down here. ... got it ...

CMP ...

ACDR I've already got ... Just wrap it around that ... down there.

CMP Okay. Here's the TV cable.

ACDR Stand by, Vance.

CMP How are we running on time?

20 36 55 ACDR 46 minutes ...

CMP The only thing really - ...

ACDR Okay. Now, Vance, let me have ...

CMP That's the camera ...

ACDR That's in. Okay.

CMP Now, you need the monitor cable.

ACDR The monitor cable. ... the original ... of the camera.

CMP ... Now you've got cable, you've got lens. You've got about everything, Tom.

ACDR Okay. And it's hooked up.

20 37 38 DMP Let me check this caution and warning here. ...

ACDR All right. Go ahead. On the left, arrows pointing to the rear, left.

DMP I got it, Vance. ... over the side ...

ACDR Yeah. Okay. Vance, start hooking this camera.

CMP Okay. Maybe you should stick it in the window first and then I'll route it.

20 38 12 ACDR Okay the cameras are set.

CMP Okay. Deke, I guess it's in your window.

DMP Yeah.

ACDR Wait let me check just the rear part of this.

CMP Okay.

20 38 23 ACDR AVERAGE, SLAVE, and LINEAR; AVERAGE, SLAVE, and LINEAR. It's set.

CMP Okay; we're cased on the lens? Did you recheck it or -

ACDR Okay. Let me check the lens. Step 22, 12, and 15. ... Okay. It says here, Vance - -

DMP I'll probably have to get a light or ... in here a second.

ACDR Okay. That goes in 605.

CMP Okay, f/22.

ACDR Yeah.

CMP 25 and - -

ACDR 15.

CMP 15?

ACDR Yeah. I think it's all set.

20 38 55 CMP Yeah, it's set.

ACDR Okay. Deke, ...

DMP I'm going to have to ...

ACDR Might take it over there and ...

20 39 04 CMP Yeah, why don't you do that.

ACDR Okay. That's back in 605.

DMP Okay.

DMP ...

ACDR Everything.

DMP We'll take the worse one. We'll take the camera -
the bracket.

CMP The camera or the bracket?

DMP The bracket.

CMP The camera's in the window.

DMP ... screw this down a little bit?

CMP Well, let's see what we got here ...

DMP Yeah.

CMP Okay. I'll put the camera back.

DMP Put the camera back.

DMP Okay, now then, ...?

20 40 17 CMP Yeah. Everything's set, Deke. All you have to do is
put it in.

DMP All we have to do is ...

CMP Yeah, it's got to go around the right side, Deke.

DMP Yeah. Down ...

DMP ... got the monitor all set up.

CMP Okay. What lens do we want on the Hasselblad, Tom.
I think it's one that's right here.

ACDR Okay. Let's see ... Set it for ...

CMP Okay. Actuate camera, verify camera ...

DMP Does it say we're supposed to put this camera in
yet ...?

20 41 30 CMP This zero-g business is really something.

DMP Yeah, it is.

DMP How are we coming on time, Tom?

ACDR We've got 20 minutes ...

DMP Okay.

CMP Okay, here's your camera.

DMP Hey ...

20 42 25 CMP Sure. And here's your ...

DMP ...

CMP You want to put it next to the hatch or someplace?

20 42 33 ACDR Ideal place for this little mother.

CMP Yeah, I think we've got everything pretty well in
shape here.

ACDR ... come on back up here and do a ...

DMP Okay, do you want to get this hookup down there ...?

CMP Yeah, I'll get it.

DMP Okay. I'll get back up on the couch.

CMP In the meantime, Tom, ... here's a couple of springs
for the ...

ACDR Okay.

CMP Okay, Deke.

DMP Okay. ...

CMP Okay, hand me the cable. Okay, this goes, would you describe it - it goes to CM 2 ...

DMP All right.

ACDR I'll hand it to you in a second.

20 43 21 DMP Panel 181 CM STATION POWER, OFF.

CMP Just a second, Deke, CM TV STATION 2.

DMP I think the POWER's OFF.

CMP Is it STATION 2?

DMP Yeah. CM 2 STATION - -

20 43 38 CMP Okay, that's all I wanted to know. Okay, POWER's OFF.

DMP Yeah. CM ... STATION receptacle.

CMP Okay. I've got to disconnect - -

ACDR That white connector down there.

CMP - - one other ...

DMP Disconnect DM ...

ACDR That's that white one.

DMP Yeah. Now there's something ... I never knew we had - -

ACDR There's the ...

DMP - - that kind of a ...

DMP It says secure the utility strap in R-5.

CMP Secure what, Deke?

DMP Secure it with the ***

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

ACDR Roger. Through ARIA. We're busy on page 15 - page 3-7 of the checklist and the S-IVB maneuver.

20 44 30 CC-H Roger, Tom. The comm is pretty bad here. Tell me again what page on the checklist you are.

20 44 35 ACDR 3-7.

DMP ...

CC-H Okay. And we'll be standing by.

ACDR ... We haven't completed parts of 2-4, 5, and 6 in the list.

CC-H Okay.

CMP Okay, the command's TV's hooked up. Now the utility strap, I guess I don't understand.

DMP Well, I don't ... The utility strap from R-5 was to secure what you disconnect down there.

20 45 00 CMP Oh, okay.

DMP ...

DMP And CM/DM CAMERA POWER, ON, up.

20 45 11 CMP Stand by. CM/DM CAMERA POWER is verified ON.

DMP TV AMPLIFIER, ON.

20 45 18 CMP AMPLIFIER, ON.

DMP CM 1 TV STATION POWER, ON.

20 45 27 CMP CM 1 TV STATION POWER, ON.

DMP CM 2 TV STATION POWER, ON.

20 45 32 CMP CM 2 TV STATION POWER, ON.

DMP TV STATION SELECT CM to CM.

20 45 35 CMP Okay, it's CM. And do they want CM 1 or 2?

DMP TV STATION SELECT CM 1, CM 1.

20 45 40 CMP CM 1.

DMP Check monitors and adjust camera pointing and lens if required.

CMP ... something to look at it.

DMP Okay. That takes care of all of that.

CMP Okay.

DMP Now, you got the DAC all set up?

ACDR The DAC is set up ...

DMP Okay.

DMP And, only thing, Vance, is that ... cable connector ...

CMP Well, there's supposed to be a routing for the TV cable.

DMP There is?

DMP Okay. The next thing we need out is the HRC.

20 46 11 CMP It's out.

DMP All right. Magazine 6 on camera.

CMP Yeah.

DMP 50-millimeter lens.

CMP I got them.

CMP Cotton pickin' hoses are getting out of here.

DMP Sure are a pain in the ass. Thank you.

20 46 38 CMP I go down there and I twist around.

DMP Go back and pick up systems checks here.

CMP Okay. Go ahead.

DMP Okay, service module RCS monitoring check.

CMP Go.

DMP SERVICE MODULE RCS QUAD HELIUM, four, talkback gray.

20 46 56 CMP Gray.

DMP SERVICE MODULE RCS PROPELLANT, eight, talkback gray.

20 47 00 CMP Gray.

DMP SERVICE MODULE RCS PSM PROPELLANT, four, talkback barberpole.

20 47 05 CMP I can certify that's barberpole.

DMP And SERVICE MODULE RCS PSM HELIUM, talkback barberpole.

20 47 13 CMP Okay, HELIUM's barberpole.

DMP CM[sic] RCS PSM MANIFOLD ISOL, talkback, gray.

20 47 19 CMP Okay, gray.

DMP Okay, RCS INDICATOR selector SM A, B, C, D, and PSM and on all of them you want to check package temp - -

20 47 26 CMP Okay, package temps are all - -

DMP - - 115 to 175 - -

CMP - - within the correct range.

DMP - - PSM zero.

20 47 36 CMP And PSM is zero.

DMP HELIUM PRESSURE, 4100 to 4200.

20 47 42 CMP Okay. And they all are.

DMP SECONDARY FUEL PRESSURE 178 to 192; PSM 130 to 150.

20 47 55 CMP Okay, PSM 130 to 150. On the SECONDARY -

20 48 00 DMP Okay.

CMP Wait a minute; I don't know about that.

DMP SECONDARY FUEL PRESSURE, 178 to 192.

CMP Oh, we don't have SECONDARY on PSM. Okay. Okay, now where are you?

20 48 12 DMP Okay. ... HELIUM TANK TEMP.

CMP All right, and which one on the - Okay, what should the TEMP be?

DMP It doesn't say.

20 48 25 CMP Okay. Well, it's - I think it's all right. Okay.

DMP Okay. SERVICE MODULE RCS INDICATOR switch PROPELLANT QUANTITY. Check quantity.

CMP Quantity.

DMP ...

CMP Well, it's high ...

DMP That's okay.

CMP Okay, that's all good.

DMP That's good. Let's go to CM RCS monitoring.

CMP Yeah.

DMP CM RCS PROPELLANT talkback, two, gray.

20 48 43 CMP Two, gray.

DMP Okay, select CM 1 and 2. Check the TEMP, the PRESSURE ... 80 ...

20 48 50 CMP Okay, that's good.

DMP HELIUM PRESSURE is ...

20 48 55 CMP That's good.

DMP Manifold pressure on 80 to 105.

20 48 59 CMP Okay. 80 to 105 is good.

DMP Great. Right on the nose.

DMP Okay. EPS monitoring. ... right over here. If I can get down here.

DMP You may want to take that one.

CMP What's that?

DMP ... on my side ... I can ... secondary glycol loop check.

ACDR Okay, well that's coming up in the next few minutes ...

20 49 29 CMP Okay.

DMP ... Why don't we terminate ...? Can we do that, Tom, and not screw it all up?

ACDR All right ... a few minutes.

CMP Good idea and - -

DMP ...

CMP I've got a feeling that we may have skipped some stuff after that, better go back and check the checkmarks.

20 49 51 DMP Right. I got to ...

DMP Okay, so we're at 5 minutes?

ACDR Yeah, about 1 hour.

DMP Pardon?

ACDR We're at 1 hour.

DMP 1 hour ... I'm suppose to ... 8 - 9 minutes.

CMP Can I help you on the sequence?

ACDR Yeah, I tell you what, I've already done a bunch of the switch list. I've already ...

20 50 18 DMP 1:01:14.

CMP Okay. 16, MAIN A, MAIN B.

ACDR Go.

CMP Okay, CAL - COAS POWER, ON, up.

20 50 25 ACDR Okay, got it.

CMP Have you got minus 100 in the ...

ACDR Yes. Yeah.

20 50 29 CC-H Apollo, Houston. We are 1 minute from LOS ARIA. I'll give you a call at Vanguard in an hour and 12 minutes.

20 50 35 ACDR Roger. Okay.

CMP EMS FUNCTION, DELTA-V.

20 50 38 DMP Go.

CMP RATEs - MAN ATT to RATE COMMAND.

20 50 41 ACDR Yes. Go.

CMP ATT DEADBAND, MIN/HIGH; THC POWER, ON.

20 50 43 ACDR THC POWER is ON.

CMP RHC POWER, NORMAL, 2; AC/DC and DIRECT, number 2 MAIN A, MAIN B.

20 50 46 ACDR And DIRECT number 2. Okay.

CMP You got NORMAL and DIRECT. BMAG MODE, three, to RATE 2.

20 50 59 ACDR RATE 2.

CMP RCS TRANSFER, SM, and I'll do that again.

ACDR Yeah, I ...

20 51 09 CMP Okay, I'll do it again. We've got eight talkbacks. Okay, got to load the DAP. Have you loaded the DAP?

ACDR Yeah, but recheck it ...

DMP ...

20 51 26 ACDR This comm is pretty bad, just wait until we're over Vanguard.

20 51 32 CMP Okay, did a VERB 46 ENTER; now a VERB 16 NOUN 17. You got - we have to load that.

ACDR You got all of that? ...

CMP Huh?

ACDR ...

20 51 56 DMP What the hell was that vibration?

ACDR ...

CMP Okay, that's 359, 196, and 1.

DMP Okay.

CMP NOUN 22.

20 52 13 CMP What was that just then? I saw something go by in a rush.

ACDR Looks like a big bunch of shit coming out of the S-IVB.

DMP I see kind of - looks like ion glow out there.

ACDR Yeah. ... coming down the S-IVB. ...

CMP Okay, VERB 63, as they were at the attitude, how are the needles?

ACDR ...

CMP Okay. So, by 49 we should have maneuvered; 59, that's nonpropulsive vent.

ACDR Yeah.

CMP 59, S-IVB maneuver complete. We do have nulled needles.

20 52 52 ACDR Yep.

CMP Thank God.

ACDR Yeah.

CMP Okay, CM separation. Okay, I'll start getting ready on this.

ACDR All right.

CMP Set DET counting up to SEP. That's at 1:14.

20 53 03 ACDR I've done that.

CMP Okay. ATTITUDE SET thumbwheels - 0, 180, 0.

20 53 09 ACDR Okay, I've already done that.

CMP 0, 180, 0.

ACDR Okay.

CMP Okay. CB RCS LOGIC, two, OPEN.

20 53 23 DMP Circuit breaker RCS LOGIC, two, OPEN.

CMP CB SEQ LOGIC, two, CLOSE; verify.

20 53 30 DMP SEQ LOGIC, two, CLOSED.

CMP CB SEQ ARM, two, CLOSE.

20 53 35 DMP SEQ ARM, two, CLOSE.

CMP SEQ LOGIC switches, two, ON, up.

20 53 39 DMP One, up; two, up.

CMP Okay. ARM your RCS and THC.

20 53 45 DMP Okay. THC is ARMED, ARMED.

CMP I'm going to call a VERB 49.

20 53 52 DMP Okay.

CMP And what is our attitudes.

DMP ...

20 53 57 CMP Okay. And, Deke, I'm going to get you a FUEL CELL REACS VALVES to LATCH. And ... GDC ALIGNED.

DMP Okay.

CMP We're standing by for 56.

DMP Okay.

20 54 05 CMP That's good. Okay. How's our monitor look? Where the hell is that?

20 54 34 DMP ... monitor?

CMP Yeah. Yeah, here it is.

DMP Here it is.

CMP ... see if you see anything.

CMP ... out of the way.

DMP Feel that vibration?

CMP Yeah. Well, I wouldn't say that it's great, but it doesn't particularly ... However, it's ...

DMP I'd say that looks like the ... out the window, doesn't it?

CMP ...

DMP ...

20 55 02 CMP Yeah. Yeah. ... in position. Okay, now let's see, where's the checklist?

CMP ... these monitors somewhere ...

DMP ...

CMP Going down to 350.

DMP Yeah. ... the hatch, Vance.

CMP Yeah, I think so.

DMP Right there.

20 55 43 CMP Somewhere, maybe. Actually, it's not a very good ...

20 56 01 CMP How ... our time's doing, Tom?

ACDR We've got about 8 minutes to go.

DMP ...

CMP Yeah, uh huh. And, Deke.

DMP Yeah.

CMP If you don't mind, I'll let you try to ... that monitor.

DMP Okay.

CMP ...?

DMP In my pocket.

CMP Okay, let me get it. Here.

20 57 03 CMP Okay. ... for the book.

CMP I need help.

DMP Okay. Maybe we can write in the other one.

CMP It doesn't matter.

ACDR You want one of these, Deke?

CMP Okay.

DMP We already got the VERB 49 in?

CMP Yes, sir.

DMP All right.

CMP At 56, you're going to put the TVC SERVO POWER on, and I'm going to go down and hit the CM panel - panel 400 ... And at 58, I'm going to go to CM 2 ... And Deke's got ... PYRO, ARM.

20 57 49 CMP Okay. You got about 3 minutes 10 seconds to go. So let's ... 14 - we've got 4 - 16 minutes. ...

DMP ...

CMP Okay. There's a black sky out there.

ACDR It is black.

DMP I think we're over the horizon there.

ACDR No. There it is. ... what's going on ...

DMP ... out there.

CMP ... S-IVB.

DMP Some little ... gadget there. Right outside the window.

CMP That's that ...

CMP Oh, the ... picking up here. ... right of the command module ...

CMP Okay.

DMP Okay. Well, let's see ...

20 59 07 CMP Okay, Tom, why don't you put this TVC SERVO POWER 1 to AC 1/MAIN A. I'll go down and - -

ACDR Okay. TV SERVO POWER 1 ...

CMP Panel 400.

ACDR I got it. Where'd you put the monitor, Vance?

CMP It's up - -

ACDR Oh, almost -

CMP - - behind you.

ACDR Oh, okay.

DMP Okay. ... work on that camera.

CMP And the silver camera - is that thing out?

DMP Yeah, I got the silver camera. ... on the hatch ...

CMP Good. Maybe I can use it if I get a chance. Okay.
Are we at 56, Tom?

ACDR Yeah, 55:31.

20 59 49 DMP Okay. HEAD WHEEL MOTOR, DRIVE, Vance.

20 59 53 CMP I'm going to turn it to RECORD. And I'm just going
to stay down here so that I can get this thing to
CM 2.

DMP ...

CMP ...

DMP Hey, look at those stars. That's not stars, is it?

DMP ..., Deke.

DMP Well, I'll tell you, I just came ... this monitor.
I think I can tell more when I put it out the
window ...

CMP It's black out there right now.

DMP I want to ... what I can see looking out the window.
...

ACDR ... looking real good ...

CMP Okay.

DMP I think the Velcro works beautiful. ...

CMP The lens is set up, right?

DMP Check it.

CMP Okay.

DMP ...

DMP Sure glad we had them tape that stuff, Tom.

21 01 05 CMP Here we go into CM 2 and what else was there to do down here? Was that all?

ACDR I think so.

DMP CM 2?

ACDR Yeah, that was all.

DMP ... TAPE RECORDER: HIGH BIT RATE, RECORD, FORWARD, COMMAND, RESET. Stand by on the PYROs.

CMP ... that high bit rate ...

ACDR Yeah. We - we got everything done except the ...

DMP Okay. ...

21 01 32 CMP Okay. We're at 57:30.

ACDR Okay. I'm going back to INERTIAL on the ...

21 01 49 CMP You got the PYROs, ARMED?

ACDR Okay.

CMP Yeah.

21 01 53 ACDR Okay. ... PYRO A, ARMED; B, ARMED.

21 01 57 CMP Okay, and tape recorder ... You got HIGH BIT RATE, RECORD -

21 02 06 ACDF - attitude and we're going to be doing a 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, of course, we're not seeing much in it. We'll keep an eye on it.

CC-H Roger. Understand.

21 02 38 CMP Okay, Tom, did you want to talk to ground? At 59:30 we'll go to EMS MODE, NORMAL, and I'll hit RCS COMMAND, ON.

ACDR All right.

21 02 45 CMP Not yet. And at 59:58, you're going to thrust plus-X. At zero, you're going to hit the CSM LAUNCH VEHICLE SEP pushbutton.

CMP Yeah.

21 07 01 ACDR CMC in AUTO. Okay, ... maneuver.

CMP Damn, wish that ... would stop.

ACDR Something is stopping now.

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

CMP Roger.

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

CMP Okay, good.

CC-H Roger, Tom.

21 07 34 CMP Okay. If you need the camera ever, let me know.

ACDR No, I'm too busy. Oh, that scared the hell out of me.

CMP I think we hit the hand controller.

DMP All I'm trying to do is keep the TV pointed ... If you need me to do anything else, holler.

ACDR Ah ha, now we're going to get it.

CMP Okay, good.

21 08 05 ACDR It's so much better in the simulator.

CMP Yeah.

ACDR Okay, stand by.

CMP ...
 21 08 30 ACDR Stand by.
 CMP Okay.
 ACDR Don't say nothing, I'm concentrating on ...
 21 09 30 ACDR ... getting cold ...
 21 09 38 DMP ... cold ...
 ACDR ...
 CMP Okay. ... you're hard docked.
 ACDR Right about there.
 21 10 08 ACDR Got contact.
 CMP CAPTURE. CAPTURE. CMC, FREE. No, CMC, FREE.
 21 10 13 ACDR CMC, FREE.
 CMP Okay, good. (Laughter)
 ACDR PROBE, RETRACT.
 CMP Give her 10 seconds.
 ACDR Roll looks beautiful. Roll is right.
 CMP Okay. If you're ready, I'll RETRACT.
 ACDR Okay, RETRACT.
 21 10 27 CMP RETRACT.
 21 10 32 CMP PRIM 1. Do you see it coming in?
 ACDR Yeah. It's coming in.
 21 10 36 DMP Crunch.
 21 10 38 ACDR And we've got a hard dock.
 CMP Oh man; good deal. (Laughter) Crunch. Crunch.

21 10 43 CMP Okay. We got talkbacks gray and it's beautiful.
ACDR ... hard dock.

21 10 47 CMP Okay. EXTEND RELEASE; coming OFF. And - -
ACDR (Laughter)
CMP - - RETRACT is OFF; PYRO ARM, SAFE, Tom.

21 10 56 ACDR Okay. PYRO ARM, SAFE. All right.
CMP SECS LOGIC two, OFF.

21 11 00 ACDR Roger. Two, OFF.
CMP EDS POWER, OFF.

21 11 03 ACDR EDS POWER, OFF. Go.

21 11 14 CMP Okay. TVC SERVO POWER, one, OFF.

21 11 16 ACDR Yeah.
CMP Okay. Panel 8, CB RCS LOGIC, two, OPEN.

21 11 22 ACDR CB RCS LOGIC, two, OPEN.
CMP CB DOCKING PROBE, two, OPEN.

21 11 26 ACDR DOCKING PROBE ...
CMP Okay. Next page. We're going great!
ACDR Yeah. (Laughter)

21 11 34 CMP Oh man, am I glad to be past this.
ACDR Son of a bitch.

21 11 39 CMP Okay. CB (Laughter) - CB EDS, three, OPEN.
MS (Laughter)

21 11 44 ACDR Okay. Circuit breaker EDS 1, 2, 3, OPEN.
CMP COAS POWER, OFF.

21 11 50 ACDR COAS POWER, OFF.
CM EMS, OFF/STANDBY.

21 11 52 ACDR EMS, OFF/STANDBY.

21 11 54 CMP Launch vehicle SPS INDICATOR switch to GPI.

21 12 00 ACDR All right. GPI.
CMP THC and RHC, LOCKED.

21 12 05 ACDR Okay. We're LOCKED.
CMP You already stopped the DAC. And, I think, PCM BIT RATE, LOW. I'll get the - -
DMP Little nervous there, eh?
ACDR Well, you see, we started INERTIAL ... comes around ... pressure ... pitching up, and ... the harness and the Earth, but I couldn't see the COAS. Like the shade of Gemini 9.
CMP Yeah. Hey, Tom?
ACDR Yeah?

21 12 31 CMP You know when we were coming around, I just didn't realize the big difference between your window and mine. That's why I was telling you, watch it keep coming. Because it was coming out of my window. And I guess it's - probably that I hit the hand control and that gave us the ...
ACDR All right.
CMP Okay. ...

21 12 52 ACDR Okay. You want us to go ...

21 13 01 CMP Man, I feel that ...
ACDR Oh, man. ...
CMP Hey, Deke, I got to get down there.
DMP Okay.

DMP God damn, looks ...

MS ...

CMP What are you looking for?

DMP ... there's a big ...

CMP ...

ACDR ... a panel.

MS Yeah, yeah.

ACDR We're supposed to ...

CMP ...

ACDR Go ahead.

CMP ...

21 14 32 ACDR ... panel over here, this way.

CMP Is that right? Okay.

ACDR God damn! ...

CMP Okay, ...

ACDR Okay, well I'm going up ...

ACDR ...

21 15 34 CMP What time is it, by the way?

ACDR 1:24.

CMP Okay, we're on schedule.

ACDR 1:25.

CMP When I get the ..., Tom, ...

ACDR ...

CMP Thank you.

21 16 00 CMP Yeah, we ought to be there; we're in pretty good shape.

ACDR ...

CMP Okay, I'm going to open the hatch here, PRESSURE EQUALIZATION valve.

ACDR ... go do it.

CMP Hey, here's another washer.

CMP Yeah.

DMP ... down pretty close to ...?

21 17 18 CMP I'll tell you what, Deke, the stuff right now is mainly that ... and if you can catch up ... access ... I'll ...

ACDR Will you give me a Flight - Flight Plan?

CMP Trouble is where ... washer.

ACDR Let me have it, I'll put it up. Right here.

ACDR Man, I've got a ...

CMP Hey, I've got to ...

ACDR ...

CMP Oh, yeah.

ACDR ...

CMP ... (Laughter)

ACDR ...

CMP Oh, that's ...

ACDR Let me have ...

21 19 04 CMP I'll tell you. You know, I don't know much, but I'd say ...

ACDR ...

CMP Yeah. ... a little lower ...

ACDR Yeah. ...

21 19 44 CMP Okay. Hey, Tom?

ACDR Yeah?

CMP I've got a stable pressure down here so we're going to move right ahead and open up the hatch.

ACDR Sounds good.

CMP You've got the drift check ..., right?

ACDR Right here.

DMP Would you hand me a Flight Plan ...

DMP You know what? ...

CMP Yeah.

21 20 58 DMP God damn! ...

CMP ...

DMP ...

DMP ...

DMP Do you want to hold that - that hatch, please? ...

DMP Tom?

DMP Let's see, ...

DMP Can I help you on the checklist?

DMP Can I help you on the checklist?

DMP All right. ...

DMP Hold that ...

DMP Okay.

DMP ...

21 27 27 ACDR Roger. Got a good hard dock - middle lined up, and all the latches are good.

21 27 49 ACDR Okay. Well, we're kind of busy now, we'll pick it up. Couple of quickies in here.

DMP Okay.

DMP Okay, what have you got?

21 29 11 DMP Okay, prepare for CM/DM ... on panel 6. ... POWER; OFF. VHF AM, OFF; FM, OFF; SUIT POWER, OFF; AUDIO CONTROL, NORMAL. Okay, on 274. Okay. ... 274. Yeah. Circuit breaker DOCKING SYSTEM A, six, OPEN.

CMP Six, A, OPEN. Verified.

DMP ... and the other one is ... CM/DM POWER, two of them.

CMP Yeah, all 12 should be OPEN.

DMP SYSTEM A, SYSTEM B. Circuit breaker DOCKING ... You got it? Well, next is connect DM umbilical, page S/2-3. Thank you.

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

ACDR Roger. Read you loud and clear.

ACDR We're on page 4-5 in the Launch Checklist. 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 Vance, where are you? Is that the ... Deke and I had ... down below us and out in front of ...

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

ACDR All right, ...

CC-H Okay.

ACDR Yeah. All right. Well, you're ... on it right now. We're in the middle of this checklist. Deke says the power's off. His comm power is off, and, also, looks like Vance's headset went out. We'll call you on that later.

21 33 21 CC-H Okay, Tom, copy. And, Tom, that - that transmission I heard loud and clear.

ACDR Okay.

21 34 10 DMP Okay. Connect *** I'm back here, post umbilical connection configuration. Panel 6: POWER, AUDIO; VHF AM only, T/R, ...

DMP Okay, then 274: Circuit breaker DM POWER MAIN A, CLOSED.

CMP Okay. MAIN A's going CLOSED.

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

DMP Hey, Dick?

CC-H Yeah, go ahead, Deke.

DMP ...

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

21 35 17 CMP 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 98.

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

DMP Go ahead, Dick.

CC-H Okay, we need O₂ TANK 1 QUANTITY.

ACDR ... TANK O₂ QUANTITY ...

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

ACDR QUAD Alfa ...

21 36 22 CC-H Okay, and the same thing applies to that one.

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

ACDR ...

CMP ... quad Alfa ...

CMP Okay, ...

CMP You got ... Okay, ...

21 37 20 CMP Camera's ...

CMP ... 14040.

CMP ..., I guess, I can ...

CMP Yeah, I'll ...

ACDR Okay. ... the hatch. Put it back ...

CMP ...

ACDR Well, ...

CMP ...

21 39 20 CMP Yeah, ...

21 40 32 DMP I'll tell you, we've got these quantities.

CMP Okay. We're doing fine.

21 43 59 CMP (Laughter) Roger.

DMP I got the ...

CMP That's better.

DMP Well, let's see.

21 49 48 DMP We don't have anything for a little while.

CMP I'm going to go look at stars ...

CMP Boy, ... lightning. I guess it's ...

CMP Okay. ...

ACDR Okay, I'll watch it, too.

ACDR 016 ...

21 52 50 ACDR ... roll is 00 - 001.6, pitch is 017.2, yaw is 359.0.
... Starting the S-IVB ... attitude.

CMP Yeah, we're really not in that ...

ACDR ... 2 hours ...

ACDR Delta-V ...

22 00 00 ACDR You have a ... light on.

DMP Yeah, ...

CMP Okay, ... why don't I go ahead and call? Okay,
VERB -

22 04 25 CMP Yeah.

CMP Yeah, that helped.

DMP We're upside down.

22 15 15 DMP Okay, why don't we shine a little light up there ...

22 15 32 DMP Okay, TAPE RECORDER: HIGH BIT RATE, FORWARD, COMMAND,
REWIND.

22 15 52 ACDR ... at 12:56.

DMP ... I can see these ... light come out when the horizon.

22 16 16 ACDR Sunrise.

ACDR Sunrise at about 24.

DMP Tom, ... look out this window. God damn, I can't ...

ACDR Oh.

DMP ... help with this ...

ACDR All right.

CMP ...

DMP You can look straight across ... Okay, I'll turn this down.

ACDR What, at the aurora?

DMP Yes.

ACDR I don't know what else it could be.

DMP ...

ACDR Yes.

DMP Yeah. I'll be damned. ...

CMP Yeah.

22 17 28 ACDR I've seen a ... horizon time like that. Not near that bright though.

CMP ...

ACDR Oh yeah. I can look out through the hatch window.

CMP Why. When you're coming through aurora ... a little light.

CMP Loud and clear, Dick. And we're setting up here for ... All ready to go.

22 18 00 CC-II Okay. Again the comm ...

CMP Understand. Okay. And we -

ACDR ... see what's our roll angle.

CMP Yes, I went up and take [sic] a look ... tunnel.
That's perfect alinement.

ACDR ...

22 19 13 CMP Yes, look at that. Man, is that pretty!

DMP We took some pictures of the ...

CMP Yeah.

DMP Now you got the ...

ACDR Yeah. Got it right here. ...

CMP Look at the speckles going away.

CMP Okay, we're up to 1515, SERVO POWER 1, AC 1.

DMP All right. Go.

CMP And I hope I don't get your ...

22 19 57 DMP The Government should give you an honor. It looks
good ...

22 20 11 DMP Man, get this ... up. We've ought to have ...

DMP It's really tough getting down there and back.

22 20 26 CMP Okay, we're coming up on 58. ...

22 20 38 CMP That's the time to be - ARM the PYROs.

22 20 53 DMP Okay, ... PYROs.

TIME SKIP

22 56 17 ACDR 1 second probably be here - going to be about
18 seconds.

DMP ...?

ACDR Okay. I'll put it in a bag for you.

ACDR Think I'll leave my biomed on tonight. ...

ACDR ... Aw, we've got about ...

CMP ...

22 57 35 ACDR Okay. Coming up to ... We're going to get ATS at
about 18. Check on ATS. You going to get your
checklist?

CMP Yeah.

ACDR Okay. Acquire ATS high gain: MANUAL, WIDE, minus 78,
and yaw 34. ...

CMP Pitch is minus 78?

ACDR Yaw, 34.

CMP When do we power it up?

22 58 12 ACDR We're going to acquire ATS at ... We've got ATS
coming up.

CMP ... 19.

DMP Well, the high-gain pitch rate is on page

ACDR Can I help you on that, Vance?

ACDR ... we've got a bubble ...

ACDR You leave the - get the bags ..., Vance? ... keep
the back circuits ...

ACDR Hey, Vance. Check the bags for the ... your helmet?

CMP ...

ACDR Yeah. Great ... it out for me.

DMP Yes. That's a noisy son of a bitch.

ACDR Yeah, is sure is. Okay. ...

DMP Man, that God damn ... is a noisy son of a bitch, isn't it?

ACDR ...

DMP I can hold some of that for you, Vance.

ACDR ...

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.

DMP Go ahead, Dick.

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

ACDR Did you get those.

DMP Yeah. ...

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

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

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

CC-H Okay.

ACDR Are we locked on?

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

ACDR ... ATS ...

CC-H Roger, Deke.

DMP ...

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

CC-H Loud and 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 ...

23 05 53 CC-H Okay.

23 06 06 ACDR Go ahead ...

TIME SKIP

23 51 12 ACDR Go ahead.

ACDR Roger. ...

ACDR Roger.

CMP Hope it wasn't too bad.

ACDR (Laughter)

ACDR That ... going to be of any difficulty.

ACDR Trying to get ... for a ...

CMP Huh?

ACDR Did the S-band ...?

CMP Yeah.

ACDR ... we're okay.

23 52 33 ACDR Well, we could turn that down if we have to.

CMP Yeah, it could be bad if - Do we have a ..., Tom?
... got it.

CMP Deke, you got a minute?

CMP You mind plugging that in down there ...

CMP Well, it should be strapped to the side walls or the -
kind of directly in front of you or I can snap ...
Yeah. That's a good safe place for it ...

CMP Yeah, it could be. But there is a procedure, and I
ought to remind everybody what it is. It calls for
cleaning out the urine receptacle. You'll - yeah.
It's all right. Urine dump ... Verify. Should be
experts on that. Yeah. Okay. Connect plumbing.

CMP ...

23 55 13 CMP ... It should go. That's ...

ACDR ...

CMP Say what? Yes.

ACDR Vance, ...

CMP Yeah.

ACDR ...

CMP Sure.

ACDR ...

CMP Okay. ... Yeah.

23 56 23 ACDR I had a hard time ...

CMP Yeah, ...

CMP ...

ACDR ...

CMP Okay. Yeah, go ahead. ...

CMP ... taken off. ...

CMP ... me a hard time. ... connect it back. Okay?

ACDR Okay.

CMP I'll get this ... out of the way.

CMP Okay. Ready to go, Tom. Now, ... in the LEB. Okay.
What's your ...?

CMP Oh.

23 59 49 CMP Yeah. Over Orroral Valley.

#

DAY 197

00 02 13 CMP I'll set up the ...

 ACDR ...

 CMP ...

 ACDR I ... EMP ...

 CMP ...

 ACDR ...

 CMP ...

 CMP ... turned it off yet?

00 11 44 ACDR No. ...

 CMP Okay.

 CMP ...

 ACDR Hello, Houston, Apollo ...

00 13 26 CC-H Apollo, Houston. How do you read?

 ACDR Roger. Loud and clear.

 ACDR Houston, Apollo.

 CC-H Apollo, Houston. I'm sorry; we dropped into a real
short keyhole there. How do you read me now?

 ACDR Loud and clear, Dick.

 CC-H 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. Ready to copy.

00 14 31 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.

00 15 59 CC-H Roger, Tom. That's a good readback. Let me tell you just a word about the trajectory here. We have - we've got 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 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 change of plane maneuver tonight.

00 16 36 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.

00 16 46 ACDR Roger. BLOCK.

00 16 47 CC-H Okay. Two more things. We - we're ready for the VTR POWER switch, that's just one switch on panel 400, to go OFF. And we're wondering - -

ACDR You cut out, Houston.

00 17 07 CC-H Okay, Tom. We wanted the VTR POWER switch to OFF, and we - we're wondering how you were doing in getting the suits off.

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

00 17 18 CC-H Okay. I'll leave you alone.

CMP ...

00 17 24 ACDR Okay. VTR POWER switch is OFF.

DMP ... bag.

CMP I put mine in the ... bag. And I put it there temporarily because I needed the ... for exercise. We weren't using that for ... yet.

ACDR ...

00 18 20 ACDR ... upside down ...

CMP Okay.

CMP ... out of plane.

ACDR ...

CMP ...

ACDR Yeah.

00 21 42 CMP Throw it away?

ACDR Throw it away.

00 21 47 CMP ...

ACDR ... better let the air out of it ...

DMP ...

CMP Could be.

DMP ...

CMP ...

ACDR ...

00 25 56 ACDR Would you believe? ...

CMP ... supposed to be ...

CMP Should be ...

CMP It's already set up, Deke. Yeah. I got it while you were in the ...

ACDR Okay.

CMP ...

DMP ...

CMP Okay.

00 31 02 CMP Would you like to go back and get it, Deke?

CMP Oh, ... I'll get it for you. Got one right here. Here we go.

ACDR It's warm in here.

00 33 40 CMP Yeah.

CC-H *** How me?

00 35 00 CMP Loud and clear.

CC-H Roger. We're standing by, and we'll have you on 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 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.

CMP Understand.

CMP Just the outside this time. Yes, I did both ... I don't know why that is.

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

CMP Loud and clear.

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

00 36 50 CMP Okay; you've got ACCEPT and POO, and we're getting an echo from you.

00 36 55 CC-H Okay. I'm reading you loud and clear, Vance.

TIME SKIP

01 22 50 CMP TVC SERVO POWER ... 1/A, 2/B. RCH [sic] POWER, NORMAL, two; AC, DIRECT, OFF; BMAGs at 1/2. SPACE-CRAFT CONTROL, SCS. ... your GIMBAL MOTORS.

ACDR ...

CMP Okay, clockwise, no MTVC. GIMBAL MOTORS, PITCH 2, YAW 2, START.

DMP ...

01 23 49 CMP And your trim is plus 7.7 and minus 20.5. You're having - CMC, and then check MTVC.

DMP ...

CMP Okay, AC/DC and MAIN A, MAIN B ... RATE 2. Ready for test?

01 24 43 CMP RATE, HIGH.

DMP All right.

CMP RHC and THC, ARMED.

DMP Both.

CMP Okay. Let's check your EMS. At 67.2, that will be 54 point something.

01 25 04 CMP Okay, Deke, SPS ...

DMP Huh?

CMP Standing by. ... second burn.

01 25 26 CMP 54.2 was right. ... They hit it right on the head.

DMP ...

01 25 39 CMP Yeah, those must be pretty big swells.

ACDR ...

CMP ...

ACDR ...

CMP Yeah, isn't that nice? ... Okay, how does everything look for NCI? Going to burn BANK B. ...

CMP Do you see the power change? ... change ...

ACDR Yeah.

01 26 36 CMP Yeah, look at that. That's over the land ...
DMP ...

01 26 53 CMP You aren't ...
DMP ...
CMP Sure go
CMP Houston, Apollo.

01 27 15 CC-H Apollo, Houston. We read you clear but weak.
CMP Okay, everything's going good. We're set up for
NCl in about a little over a minute. ...
CC-H Roger. Understand you're standing by for the burn,
and just a reminder for BANK B.
CMP Roger. Understand. ... is NORMAL.
ACDR EMS, NORMAL.
CMP THC POWER, ON.

01 27 45 ACDR POWER, ON.
CMP Okay. ...
CMP ... BANK B, ON.

01 28 08 ACDR B, ON.
CMP Okay, ... ullage; ready -

01 28 14 CMP MARK.
ACDR ... ullage.
CMP I'll give a countdown. 8, 7, 6, 5, 4, 3, 2, 1, 0.

01 28 38 DMP ... OFF ... Okay, ... 1 coming OFF ...
CMP There's your trim.
DMP ...

CMP ...
 DMP Okay.
 01 28 57 CMP That's quite a jolt, isn't it?
 DMP Yeah.
 CMP Okay, ... remaining on residuals.
 DMP ...
 01 29 11 CMP ... Okay, it's minus 0.1, plus 0.1, minus 0.1 ...
 ... 14.1.
 ACDR Okay. Got it.
 01 29 41 CMP Got the ROLL, the GIMBAL MOTORS, the SERVO POWER?
 ACDR Got it.
 CMP AC BUS TIES, OFF. ... Got to get the - -
 ACDR ...
 CMP Yeah. And at 59 plus - -
 ACDR ...
 CMP Okay.
 ACDR ...
 CMP Yeah. Pitch rolled over. The attitude we've got,
 Tom. The attitude.
 ACDR ...
 CMP Is that it?
 ACDR ...
 DMP ...
 ACDR ... Man, that is something!
 CMP Yeah. Look there. Wow! I never thought the ...
 would even look like that. ...

ACDR Well, that's why ...

01 30 57 CMP Yeah.

ACDR ...

CMP (Laughing) Yeah.

ACDR ... You've got to put this light out, here.

CMP Oh, yeah. ... far away. I'll put this light out and make it cool in here. We don't need the heat.

ACDR ...

01 31 18 CMP I never have either. That's the trouble. I think I'd want to take a picture of every place in the whole world.

CMP Okay. ... Don't have much to do for a while. ... Okay! Yeah. Let's see, "If NPC not required, maneuver to SI plux-X forward attitude."

01 31 58 CMP VERB 49 ENTER; VERB 25 ENTER. Okay. Plus 12.00 ENTER; plus 14.00 ENTER.

ACDR 140?

CMP No. 14.0 ...

01 32 17 ACDR Well, okay. ... 14.00 ENTER.

01 32 24 CMP Right. Okay. Now, VERB 43 ENTER - -

ACDR Hold it. Look at the book.

CMP Yeah. First, let me find it. Plus 12 degrees, plus 14 degrees, plus 332.

ACDR Plus 332. Okay. ...

01 32 49 CMP PRO.

ACDR Did we do it?

CMP Yeah. ...

ACDR ...

CMP ...

ACDR ...

01 33 15 CMP Okay. We've got a height measurement of the AC and DP "if time permits" and me in any case, I guess; in Experiments Checklist on page 1-59.

ACDR ...

CMP Tom, look outside. Look how bright the lights are.

ACDR What island - -?

CMP ...

ACDR What island is that? Is that the Galapagos?

01 33 47 CMP We're heading for Hawaii, Tom. ... You have to kind of learn how to - It's upside down. Yeah. We'll get that ... Okay. As soon as we get this stuff done, it's ... That's right. Well, ...

DMP Oh, man, this stuff's ...

ACDR ...

CMP Okay. It's a beautiful world.

01 35 46 DMP Okay. I guess you want me to strip, or something like that.

ACDR ... ?

CMP ... Yeah. About to break me.

ACDR ...

CMP Yeah.

ACDR ... A-6.

CMP Which one do you want to do first, Deke? Your leg or your sitting?

DMP I'm going to do the ...

CMP ... with some spirit.

DMP ...

DMP ...

01 38 26 ACDR Vance, will you ...

CMP ...

ACDR ...

CMP I think I know where it is.

ACDR Okay. ... Help me get that junk straight ...

01 39 44 CMP Okay. I'm ready for Freddy.

ACDR Okay. ...

CMP No. Do you want me to take ...?

ACDR ... Okay. ... How about putting ...

CMP No.

ACDR I've forgotten how to ...

CMP ...

ACDR ...

CMP ...

ACDR You've got to ...

CMP ...

ACDR Okay. ... Okay.

01 44 17 ACDR Height, 130. ...

CMP Tell you what I'll do, Deke. ... and then I'll -
You getting the left leg or the right one?

01 45 23 CC-H Apollo, Houston through Hawaii for 2 minutes. How
do you read? Still have a couple of items. Is
there someone free to copy?

ACDR Yeah. Go ahead, Bo.

CC-H LM ascent data; look on page 1-6 of the Rendezvous Book - that's 1-7 of the Rendezvous Book: 27818.

ACDR ...

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

ACDR Roger. Purge burn at 6:30.

CC-H Your LM ascent data on page 1-7 which is about the center *** 27818.

CMP Get him to ... Get a ...

CC-H ***ger. That's 27818.

ACDR Okay; 27818.

01 46 48 CC-H Roger. And on panel 377, we'd like you to put the GLYCOL TO RADIATORS SECONDARY to the NORMAL position.

CMP Get it yet?

ACDR No.

CC-H *** to cool you off some. *** back with that problem when we have next communications pass.

DMP Okay. You're intermittent, Bo.

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

DMP Okay. Now, what's the position he wanted? ...

01 47 48 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.

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

DMP Well, it's oscillating and ...

CC-H *** 60 to 80 percent, right?

DMP Yeah, ...

ACDR Okay. ...

CMP ...

ACDR (Laughter) Oh, yeah. ...

CMP Okay.

01 54 22 ACDR Okay. While we're at it, why don't you take ...

ACDR ...

ACDR We're right on normal ...

ACDR Yeah. ...

ACDR Okay. ...

CMP Okay.

ACDR No, we're not. We're over the ...

ACDR Yeah, we'll ...

CMP ...

ACDR ... high gain ... pitch ... yaw.

01 58 10 ACDR High gain: pitch, minus 54; yaw, ...

CMP Pitch, minus 54 ...

CMP Well, I guess I'll give it a try.

ACDR In that case, ...

CMP ...

ACDR ... Okay. ...

ACDR ... down around ...

DMP ...

ACDR ... the other ...
CMP Deke, you didn't see any other ...
CMP Here they are. ...
CMP ... band of air sort of thing ...
02 01 27 ACDR Hey, Deke, you guys feel warm?
DMP No. Not anymore.
CMP Okay. I've got the ...
DMP Something like that.
DMP ... Okay. I'll get it out of the way.
ACDR Yeah. ... won't have to ...
DMP ... O₂ ...
ACDR ... Maybe ...
DMP Okay.
ACDR That's coming out of here like ... back by the hatch ...
02 06 28 CC-H Apollo, Houston through Bermuda. How do you read?
Roger. Would you please go ACCEPT so we can give
you the rendezvous REFSMMAT.

TIME SKIP

03 22 10 CMP ... we have a ...
ACDR Houston, Apollo. Well, Bo, we have a problem. ...
03 22 56 CMP Okay, Bo, everything's ... checklist ...

TIME SKIP

04 40 22 CC-H Apollo, Houston through Guam for 2 minutes.
CMP Okay, fine.
CMP Tom - -
04 41 08 CC-H Apollo, Houston through Guam for just a little over
a minute.
04 41 15 CMP Roger.

TIME SKIP

05 08 10 CMP ... down here, ... the only ... is ...
CMP Okay. That's right.
DMP Yeah. ...
CMP No, it's better than the ...
DMP ...
CMP ...
CMP ...
05 09 22 CC-H Apollo, Houston through MILA for 3-1/2 minutes.
CMP Roger, Bo. ...
05 12 37 CC-H And there's about 30 seconds until LOS.
CC-H And we're going to say good night now unless you
need to talk to us again at Quito where we get into
ATS coverage.
CMP Okay. See you in the morning - or somebody.
05 12 54 CC-H (Good night.)
CMP ...
CMP Yeah, ...
ACDR ...

05 13 58 CMP Yeah.

 ACDR ...

 CMP On the ... you know ...

05 18 31 CMP ... problem ... cabin pressure ... oxygen ...

05 18 59 ACDR Hello, Houston; Apollo.

 CMP ... So anyhow, I - I ... Now if I had a ... It's
not going to lock up by itself ...

 ACDR ... problem. ...

05 22 56 CMP Well, I ... catalog ...

05 23 32 ACDR Hello, Houston; Apollo.

05 23 37 ACDR All right, Bo. We got a problem. We can't get the
probe out to stick that wonderful little freezer up
there.

TIME SKIP

15 29 01 CMP Okay, Deke.

 DMP What? ...

 ACDR ...

15 29 26 CMP Yeah. ... see where it says 27:09, there?

 CMP So I help Deke with activation. We're supposed to
turn on the UV lamp pretty soon.

 ACDR ...

 DMP Well, we're only about 20 minutes behind, I think.

 ACDR ... We've got to get out of A-6 ... handheld DAC.

 CMP Okay. A-6 Okay. All right.

 CMP Say that again, Deke.

CMP Okay.

CMP I'll get in - I'll get your book here in a minute and help you.

ACDR Oh, shit! To get the fish out of A-6 I got to get the hatch out.

CMP You can just slide it over - under A-5. We've just got to shuttle it around where we don't need it, I suppose.

15 32 00 CMP Okay, Deke. Do you want me to read the procedures to you for - to speed up or - -?

DMP ...

CMP Huh?

DMP ...

CMP Okay. Yeah.

CMP Hey, on this zone forming fungi, are we supposed to leave the covers open?

CMP Okay.

ACDR ... flashlight ... battery went dead. Will somebody get me a ... I don't have time to ...

CMP Okay. I think they're - oh, we can find out later. Here's one.

ACDR Where you at, Vance?

CMP Right over the ...

ACDR ... flashlights.

CMP Okay. I think we'd better ask them about the covers.

15 32 53 CMP Houston, Apollo.

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

CMP Right.

ACDR We need to get some climbing(?) cables out ...

CMP Okay. That's what we thought. Thank you.

ACDR We activate the - -

CMP ... the MOCR. Oh, we didn't, huh. Okay.

DMP ...

CMP Okay. Yeah, we got to go back and do a wholesale recheck, I guess.

ACDR Okay. Deke, you have the foaming demonstration and the wicking back there, don't you?

DMP Yeah.

ACDR Can we eventually transfer those looking ahead?

CMP Did you get that, Deke?

15 34 09 CMP Okay.

ACDR The wicking and the foaming ... transfer them to the docking module? Over.

CMP He wonders if the wicking and foaming get transferred up to the docking module.

DMP ...

CMP Eventually. Not now, Tom.

ACDR Okay. There's supposed to be some fish in here someplace.

15 34 43 CMP Okay. Now.

CC-H ...

CMP Roger. Understand.

CC-H ...

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

ACDR Hey, Vance?

CMP Yeah.

ACDR ... the camera setup. Here. I'll just give you the whole thing ...

CMP Okay. Just a second. Let me - let me ...

15 36 37 CMP Okay. Now I'm ready, Tom.

ACDR Okay. Hey, I'm going to ...

CMP Okay. Well - -

ACDR ... get other stuff out.

CMP Okay, but let me give this bag back to you.

ACDR You got ... in there, too.

CMP Do you need it?

ACDR No.

CMP Do you need that for ...

ACDR ... bag ...

CMP Do you need that for your - experiment? Yeah. I guess you probably do need ... Okay. I'll put your bag up here someplace.

15 37 28 CMP I'll put it in F-2.

ACDR ... looking for the ...

CMP Oh, I'm sorry. Yeah - no, you're out of the way.

CMP Now, has anybody seen the Nikon camera it's not in its poke?

ACDR The Nikon is down here in the TSB.

CMP Yeah, ... Okay.

ACDR Here you are, Vance.

CMP Okay. Thank you.

15 39 00 CMP Deke, do you remember if that bracket's in the bottom or the top of U-1? That bracket to the Nikon - you know if - that extender - you know if it's in the top or the bottom of U-1? Okay.

15 39 47 ACDR We'll never get all that stuff ... around ... - We'll never get this ... fixed up.

CMP Well, that's why we're going to have to put some of it over in A-5. That's something that we told them we'd do on the ground, I guess.

CMP Well I'll be damned if I can find that extender.

15 40 53 DMP Well, I sure don't see the extender in U-1. Let me try F-1. Not in U-1; let me try F-1, here. Huh? Not in - Okay.

CMP My God, if it had been a snake, it would have bit me, But I sure couldn't find it. Okay, thank you. Look at these ... Look at these ... (Laughter)

CMP Gene, thank you.

15 42 58 CMP And, Deke, you know where the Experiment Checklist - could that be looked for?

ACDR I've got it down here. I'm looking at the fish.

CMP Okay.

DMP I just got the fish out. I'm going to put that back - ... the fish box - Right now I don't know what in the world's going on.

15 43 18 CMP Oh, maybe you can stuff it down to the side there or something, or put it in the TSB.

15 44 03 ACDR Yeah. Yeah. I don't know ... You mean bungee, one of these. Oh, I'll be damned. Wouldn't you know it. ...

15 45 33 CMP Hey, Tom. Going to have to get to that ... get some stuff later, I guess ... Let's see.

ACDR Yeah.

15 46 23 CMP Oh, wonder ...

 DMP Yeah.

 ACDR Okay.

15 46 44 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're about 20 minutes behind the time
 line. Deke is getting ready to go into the DM.

 CC-H Okay. Super.

 CMP We've just opened hatch 2.

 CC-H Okay. Thank you.

 CMP I guess I don't see the ZFF on here. Wonder what
 the ZFF ... on the sleep - for the postsleep orbit.

15 47 40 ACDR Let's look in the Flight Plan. ...

 CMP No. I'll look in the postsleep to see if it's there.

 ACDR Okay, ... two of them. There's another one in the
 ... Yeah. Where? Over here?

15 48 49 CC-H Apollo, Houston. We're 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.

 CMP Did any - did anybody give the old crew status re-
 port?

 ACDR Yes. Deke did it.

 DMP Yeah, ...

 ACDR ... just barely looked at it.

15 49 58 CMP Okay. That goes down in ... You got to leave it off all the time ... there's a little container in A-5.

15 50 06 ACDR A-5. ... in my pocket.

CMP Okay, Deke. Need any help?

DMP Yeah.

15 50 13 CMP Okay. I'd like to read out the checklist, and I'll check that everything's ... on the wall.

CMP Yeah. Is - is all the checklist done? Okay. We'll - we'll -

15 50 54 CMP And if you want, I'll read your checklist to you.

DMP ...

CMP It's up to you.

DMP ...

CMP Okay. And, Tom?

ACDR Yeah.

CMP Who said that we would do ZFF? I couldn't find it any place. Did - did one of you guys read it?

ACDR This morning?

CMP Yeah.

ACDR That's back in the Flight Plan. We had one last night.

CMP I know one every 12 hours, but I just didn't - Well, I looked through the Flight Plan.

ACDR It'd be right after wake up.

CMP Yeah.

15 51 50 CMP Okay. It's mine. What is it? (Sneeze, sneeze) Okay 8 - it's what? 8B is DM cabin pressure and it's over 1.3. 8A is 1.6.

15 52 43 CMP Okay. That's circuit breaker, all checked. Okay, DM POWER MAIN B or A, CLOSED? CLOSED now? Well A is CLOSED. Now I'm going to CLOSE B. Yeah. It's verified CLOSED. And ... where do you want B?

15 53 15 CMP Well, it's not. DM POWER. Okay, I'm closing it. Now you got both of them CLOSED. ...

 ACDR ...

15 53 54 ACDR Do you smell something funny in here?

 CMP Yeah, it's - just glue [?].

 ACDR Glue?

 CMP Yeah.

15 54 26 ACDR Vance, here's your flashlight back.

 CMP Thanks.

15 55 07 CMP All right. Say what it is, Deke.

 CMP Okay. I'll hand you the chart if you'll hand me the book. I'll do it and bring the book back. Okay?

15 57 52 CMP Hey, it's cool up there. Okay, do you want me to start reading, Deke? Maybe you can ...

15 58 13 CMP Yeah. Don't think I'd worry about it too much. Okay. CB's LIGHTING 1-DM A and 2-DM B, CLOSE. You're supposed to have done that. LIGHTING 1 and 2 start and then on.

 ACDR Hey, Vance?

 CMP Yeah, Tom.

 ACDR What's that ... smell up there? ...

 CMP No.

 ACDR God damn. Something's smelling like mad. Come down here for a minute. ... Hey, come here. That regulator's smelling like a son of a bitch. Come here.

CMP All right. Yeah.

ACDR What's your cabin pressure? Hang on. You hear that?

CMP Yes.

15 59 03 ACDR See what the cabin pressure is. 425.

CMP Wow.

ACDR Clamp this valve shut.

ACDR What was that our ... on the pressure? ... Hey, Deke. Deke. Hey, Deke! We're down to 425 in the cabin. We're down to 425 in the cabin. We got a God damn leak! What - what does that read up there? What's the cabin pressure up there? Okay. You guys ... I kept hearing it.

15 59 54 ACDR Get all those valves - all those valves locked - closed up there. Lock them closed.

CMP Where?

ACDR Has Slayton still got that vent ...?

CMP Oh, shit! Get it?

ACDR Okay. Man, I was wondering what the fuck, until I kept hearing this, and I figured you guys were making all the racket. And then suddenly ... so I checked you.

CMP Okay. Wow.

ACDR You got that squared away. Okay.

CMP Okay. Is it - EMERGENCY REG stopped - stopped pulling, huh?

16 00 42 ACDR Yeah, we're - we're at 4-1/2. Think we ought to ground contact and give them shit.

CMP Yeah.

ACDR (Laughter)

CMP Okay. You want me to start reading to you, Deke?

ACDR ...

CMP All right. You got the trans - Okay, you got the transfer down there, Tom?

ACDR The what?

CMP The transfer checklist like Deke's got. Have you got another one down there?

ACDR It's right in there.

16 01 20 ACDR ... Okay. Well, I'm still ... the fucking fish eggs, which is - -

CMP Okay.

ACDR ... which is probably the ...

CMP I'll go get the UVA cable.

ACDR Do you know where that is? ... The thing is, I can't leave the fucking fish eggs ... low priority.

CMP Okay. Yeah, you really ought to have it, Deke.

ACDR Yeah, go ahead ... to get the ... What did he have, the vent on for the DM?

CMP Yeah, ISOLATION. We'll have to hurry[?].

ACDR You're darn right. ... I thought you guys were ... made me feel like my ears were popping and I'll just go down and check the ... check the pressure.

CMP Okay. What page you on, Deke?

CMP Okay. I'll find it. I got it.

16 02 31 DMP I'm on comm now, finally.

CMP Okay.

DMP Okay. We're on page 1-3.

CMP Okay. How's the cabin ...

DMP That's what's wrong with that God damn checklist with you on comm here. I'm going to - Well, we're more than half. That's pretty good.

DMP Yeah, it'll build up when the regular ...

DMP It'll build up as soon as we get things going in here. Okay -

DMP AUDIO 1, ON. Okay, got all the UV stuff down in the CSM there.

CMP Okay. Let's see, the UVA cable's in that bag.

ACDR ... bag on top of A-1.

CMP Yeah.

DMP Yeah. I'll keep going up here.

ACDR ... this fish egg thing ...

CMP Okay.

ACDR ... a little while.

CMP Where do you have to do it?

16 03 24 ACDR Right on the LEB below the ...

CMP Well, I'll try and get out of our way here.

DMP Okay. I'll try that speaker box here. ... speaker box.

CMP Good.

ACDR Loud and clear.

16 03 58 DMP Okay, O₂ REGULATORS ... A coming ON ...

CMP Tom.

ACDR Yeah.

CMP Here's the camera for the ZFF, too. I guess that ought to be done sometime. It's in the checklist.

ACDR Hang on.

DMP I guess it was ... but I didn't check the light.

ACDR I don't see it ... Yeah, ZFF photos. ... DP back at 25:30.

CMP Okay. I guess that - you can stick that up on the ...

16 05 02 ACDR Yeah. I'll do that. Is there a bracket underneath that son of a bitch?

CMP ... yeah. And it's on the camera, and the camera's right on ...

ACDR The bracket is on the camera?

CMP Yes. I put it on when I ... - -

ACDR Joint Ops Checklist. Where's the Joint Ops Checklist?

CMP Well - or the Experiments Checklist. You've got that. Have you got the Experiments Checklist?

ACDR Yeah, but I can't get to it. It's down ...

ACDR Ah - it isn't in here ...

16 06 01 CMP It should be at the end there someplace.

ACDR Experiments?

CMP It think it's there - -

ACDR Joint Ops.

CMP Here let me ...

ACDR Here it is.

CMP Should be real simple.

ACDR ...

CMP ... UVA cable.

DMP Okay?

CMP I've got it.

16 06 33 CMP And let's see, which end do you get?

DMP Okay. ... cable and connect J2 ... cable ... Got it connected down there?

CMP Here's P1 and P2.

DMP Okay.

CMP Okay that's - Here's a red dot here. Red dot to red dot.

DMP Red dot - This is a yellow dot here.

CMP Well, here's a yellow dot.

DMP Yeah; one end goes to 800 - -

CMP ...

DMP Better make sure.

CMP Here's the ... end.

DMP The DM.

CMP Yeah. That's one thing we can ...

DMP That end's supposed to get hooked on to 230 down there.

16 07 29 CMP Okay. Is it supposed to be done yet?

DMP Yeah, ... it's supposed to be done before you bring it up here, but that's all right ...

CMP Okay.

DMP Take one on each one.

CMP Whatever the procedure says.

DMP ...

CMP Okay.

CMP Get it?

16 07 55 DMP Yeah.

CMP Good. Halfway.

DMP That's right.

DMP Secure UV cable using designated straps on tunnel wall. I don't know why they did all that. Just wondering whether it's good comm going in here ...

ACDR The cable ...

CMP Good.

16 08 32 CMP ... time to get the ZFF ...

DMP Okay.

CMP There's another cable there.

ACDR Okay.

CMP Another snap.

ACDR Okay. I've got to start checking things off. ...

ACDR Okay. I've got this ZFF ...

CMP Okay.

16 09 06 CMP And do you want to get the tape[?] too?

ACDR It's going to take me a couple of minutes. I - I've got - I've got the camera set up, but I need the lights and all that.

16 09 14 CMP Well, I'll let you go ahead.

ACDR Deke ...

CMP Well, if I can get by you right now, while you're getting ready to do it.

ACDR Yeah, you can get by me ... some space over there ...

DMP There's some ... down in there, Vance. Let me check on it when you're down there.

CMP Before I connect it up?

DMP No. Go ahead. Got to make certain the POWER is OFF ... on panel 230.

CMP Which POWER is that?

DMP UV ABSORPTION.

CMP Okay.

16 09 55 CMP It's OFF.

CMP Okay. It is connected to panel 230?

CMP Okay. Stand by.

DMP ...

16 10 13 CMP Yeah. Yeah, this is going to be the - the fun one.

CMP (Cough)

16 10 36 CMP Okay. ... Here we go.

DMP Got her? ...

CMP Not yet.

DMP ...

16 10 50 CMP Got it!

DMP Okay.

CMP I didn't think I could - would be able to do that.

DMP ... turn the UV - UV power ...

CMP ... Well, whatever he says.

DMP ... Okay. On 274 -

CMP Yeah.
 DMP Circuit breaker UV/DOPPLER MAIN A, CLOSE.
 CMP Stand by.
 16 11 13 CMP UV/DOPPLER MAIN A, CLOSED.
 DMP Okay. That's panel 230?
 CMP Yeah.
 DMP UV COVER, CLOSE - verify.
 16 11 21 CMP Okay. It's barber pole. It sure looks that way.
 Yeah, verify.
 DMP Okay. UV ABSORPTION POWER, ON.
 16 11 29 CMP POWER, ON.
 DMP ABSORPTION LAMPS, ON.
 16 11 32 CMP LAMPS, ON.
 16 11 33 ACDR 27:51:25 ... on the Flight Plan. ... log ...
 DMP What was that again, Tom?
 ACDR 27:51:25.
 CMP 51:25. Okay.
 ACDR ... the Rendezvous Book? Okay.
 DMP Hey, while you're down there, Vance, how about us
 making sure we got everything on the checklist before
 he checks it off.
 16 11 52 CMP I checked it off. You can check everything at the
 first ... We're configuring it.
 DMP Okay. Good enough.
 DMP Okay. ... right down through here.
 CMP Okay. I'll get out of your way now, Tom.

DMP Check those? Checked all those. Okay. Through with page 1-3. Okay. If you're - you're available, Vance, got an - a last minute checklist here, you know.

16 12 30 CMP Okay.

DMP If you're ... I'll just do it.

CMP Okay. And - if I find it here.

DMP Okay. You can start at the top here of page 1-4.

16 12 39 CMP Okay.

CMP 1-4: HIGH PRESSURE RELIEF, AUTO; verify, two.

16 12 45 DMP AUTO verified.

CMP Verify lock engage. Press - LOW PRESSURE RELIEF, CLOSE, verify.

16 12 53 DMP CLOSE.

CMP And could you turn the volume down a little on that box?

DMP Yeah. Okay.

CMP Okay. O₂ PURGE PRESSURE RELIEF, CLOSE.

16 13 06 DMP CLOSED.

CMP PRESSURE RELIEF VALVE REFERENCE to DM, verify.

16 13 11 DMP Verify.

CMP CB's INSTRUMENTATION DM A, DM B, CLOSE, verify.

DMP *** 51:25 ... Is that right?

CMP 27:51:25.

DMP 27:51:25.

CMP 27:51:25.

CC-H ...

ACDR 27:51:25. Okay. I'll be ... in a minute.

CMP Okay. CB - You got so - Soyuz POWER DM B, OPEN?

16 15 05 DMP That's OPEN.

CMP CB DM A/DM B TIE, OPEN, verify.

16 15 09 DMP DM A/DM B TIE, OPEN.

CMP CB DOPPLER TRANSMITTER DM A, OPEN; verify.

16 15 16 DMP DOPPLER TRANSMITTER, OPEN.

CMP Okay. And D-1, unstow the HHAG and mount in the high pressure relief valve recess.

16 15 24 DMP D-1 ... HHAG ... Where are you HHAG?

CMP I think it's up front on the right. I think I can see it under that bag. You have to take the ... bag out.

DMP ...

CMP Yeah.

DMP Yeah.

DMP There she is.

CMP Okay. Mount in the recess in the high pressure relief area.

16 16 01 DMP Right.

CMP Okay. Unstow TSB D-1 and mount on DM wall to right of fire extinguisher.

DMP Okay.

16 16 24 DMP To the right of the fire extinguisher. Right here.

CMP Yeah.

DMP ... work down on the ground.

CMP Yeah, sure is. Unstow bungees - two of them - from D-1 and snap to the D-4 locker.

16 16 43 DMP ... Okay.

16 16 55 ACDR Okeydoke, ... The POTABLE water INLET is now closed.

DMP Does it say how many of them?

CMP Two.

CMP Here, I - I can do that.

DMP ...

CMP ... Okay. There you go.

DMP Got another one on there.

CMP Right.

DMP ... Looks like ...

CMP Yeah, I do to.

16 17 32 CMP Sure nice to have this DM open, I'll tell you.

DMP Oh, yeah. It's got a lot of room, doesn't it?

CMP That's what's been our problem up until now.

DMP Yeah.

CMP Okay. Unstow the Flight Data File container from D-2 and snap into position on panel 845.

DMP Okay. Flight Data File - coming out. And we'll snap it up right there with the little snaps.

CMP Right.

DMP That way.

CMP Get that?

DMP Yeah.

CMP Okay. Remove TV light shield from Flight Da - Data File container and install on furnace control box Velcro.

DMP Okay. This damn snap isn't ...

CMP Put her on the Velcro.

DMP ... right here. Okay.

16 18 50 CMP Okay. Record the DM systems gages as follows: N₂ 1 and 2 tank quantity.

DMP Okay.

CMP 1 and 2 in order.

DMP N₂ - 1 is 82. Number 2 is 82. O₂ - -

CMP Okay.

ACDR - - is 84 and 82.

DMP Our cabin press?

DMP Press is 230 about.

CMP Okay. That's below a little bit yet, but it's not too far. Cabin temp?

DMP Temp is 170. What - that doesn't sound right.

16 19 28 CMP Should be 17, probably.

16 19 32 DMP 17. Oh, that's Centigrade. Yeah, it's 17. Okay. (Laughter)

CMP Okay. And PPO₂ A and B.

DMP Okay. We got on A - it's about 175, and B is 170.

CMP Okay PPCO₂.

DMP About 0.0 - 0.7, rather.

CMP 0.7, huh?

DMP 0.7.

CMP Okay. Next is DAC setup. Note: Stow miscellaneous straps, lens covers, bags, et cetera in TSB on DM wall.

DMP Yeah, right.

CMP Okay. Obtain from D-3 and assemble the following: DAC 02.

DMP Okay. D-3

CMP D-3.

DMP Right here.

CMP Uh huh.

16 20 18 DMP DAC number 02.

CMP And - you got a filter on the DAC, right?

DMP Yeah.

DMP I ... I can't believe that ...

CMP Okay. DAC 02. That's right. Mag CI02 on - -

DMP ...

CMP Okay. 5-millimeter lens; should be on it.

DMP On it.

CMP U-mount.

DMP Okay. U-mount's next. ... down in here.

CMP Here it is. Camera - that's the bracket that's supposed to come out.

16 21 06 CMP Well, I thought that - they usually ... - -

DMP No, nope. They don't. That's that - -

CMP That's the special one. Okay.

16 21 16 DMP Okay. Boy, we're going to need all those ...

CMP Okay. Yeah. No, Deke, by U-mounts - they mean - they mean the ... position it to 105.

DMP No, they don't either.

CMP Yes, they do.

DMP Nope. This is the U-mount.

CMP All right. But - position DAC U-mount: 105, 220, 235. They - -

16 21 40 ACDR Read you loud and clear, Dick.

CMP They ... DAC with bad terminology, but that's what they mean.

16 21 44 ACDR Okay; one thing that's a problem here is the fact - -

TIME SKIP

17 22 16 CMP Okay, is the WASTE STOWAGE VENT valve CLOSED?

ACDR Probably not.

CMP Okay. It says we're supposed to close that.

17 22 29 ACDR WASTE - WASTE STOWAGE VENT? Oh, yeah, that's been CLOSED. ...

CMP Okay.

ACDR Myrtle's come open ... Myrtle's ...

ACDR Okay.

CMP Okay.

ACDR Okay, I've got everything that you have outlined there.

CMP We missed the cal. Okay.

ACDR Oh, yeah.

DMP Hey, what - God damn it! I don't know which experiment we're supposed to be putting in here right now. Do you guys?

CMP It tells in this procedure, I think. I think it's 41. Check under the furnace - -

ACDR The furnace ops.

CMP - - ops.

ACDR Yeah. The furnace ops. ...

17 23 50 CMP Okay, on panel 181, CM 1 STATION POWER, OFF.

ACDR ... CM 1 ... Oh, it is OFF.

17 24 06 CMP Okay. TV AMPLIFIER, BYPASS.

ACDR ...

CMP No, it's the one over on the right.

ACDR ...

17 24 15 CMP TV AMPLIFIER, BYPASS.

17 24 18 ACDR BYPASS. Okay.

17 24 23 CMP Oh, hell; now it says you can go WASTE STOWAGE VENT valve, VENT. We just came to that because we didn't do the cal. Okay. WASTE STOWAGE VENT valve back to VENT. Sorry. Okay. ... Is that it? Now it's all a matter of getting ready for this vibration test. Have we come to that already?

ACDR Oh, yeah. That was ... That was about an hour and a half ago ... systems activation.

CMP Oh, yeah ... Okay. Well, I'll try to get that ...

17 25 15 ACDR It's 12:30, Houston time.

ACDR Okay, Vance, what's the next ... ?

CMP Okay.

ACDR ...

CMP Yeah, if I was you, I'd go ahead and -

ACDR ...

CMP Hey, Deke?

DMP Yeah?

17 26 45 CMP Just one thing. When you set up your Nikon, does that go in the same bracket as the cassette - as the ... TV did? Or does it go - - ?

DMP No, it goes on the DAC bracket.

CMP Okay. But you have to move the TV out of the way? You probably do.

DMP Yeah. Well, there's another ... here.

ACDR ... stowed, because if I move it around and ...

CMP Yeah, it was supposed to be eaten yesterday. Some of it, anyway.

17 27 32 DMP Son of a bitch! Those God damn furnace guys made this thing so you can't close it. Okay, ... 104 - 204. God damn, Reed, I'm going to kick your ass. It's not hooked up right. ... six ... full, but I've only got two in here. ...

ACDR Oh, this is bad trouble. Vance, would you pass the stuff from the TSB over here. I've got ...

CMP Well, I probably, last night, had to move them around.

ACDR ... B in 104; ... B in 204.

CMP Damn shit! Now I've lost the ...

ACDR Son of a bitch! Everything's coming out of the ... Oh, fuck!

DMP When do we get contact with ... again?

CMP Oh, stand by.

CMP Quite awhile; coverage ... in 20 minutes.

DMP Well, I can't get the door closed on it. ... Darn it.

ACDR Well, all I've got is ...

CMP What?

ACDR ... 104 and 204 in ... are all jumbled up.

17 30 10 CMP Well, this apparently has got stuff jumbled up ... Well, in holding this stuff, Tom, now I can't do anything. Let's see where I can put this. I was just about to get that thing set up ...

ACDR We don't see any data here. ... Now, here - here ...

CMP Okay, I guess you have to put ...

ACDR Yeah, we'll ...

CMP I'm not going to get ..., anyway.

ACDR Yeah.

CMP I don't have time to even start on it.

17 32 09 CMP Why - why don't you pull out the trays, Tom, and I'll try to put some of these ... in there - a couple of them.

CMP ... it on.

DMP Okay. One thing I noticed here, Vance. Maybe you got it down there.

CMP What's that?

DMP ... In this checklist, it says to the CP, "Remove TV and U-mount from bracket 605. Remove wide-angle lens and stow in F-2. Obtain zoom lens in F-2, install," and all that good stuff. ... supposed to do that? ... in this checklist, for some reason.

CMP Okay. Under what section is it?

DMP It's on page 1-6. Head of the page is multipurpose furnace prep.

CMP Yeah.

17 34 03 DMP You guys unstowed the cartridge and passed it to me, and I've done all that stuff. Then the next step is the CP: "Remove TV and U-mount from bracket 605."

CMP Okay. Well, I can do that, Deke, but I was trying to get your camera set up for the docking - -

DMP Okay. Fine. Yeah, I was just trying to figure out what we hadn't done here, you know.

CMP Yeah, I don't think we've done that.

DMP ... One I didn't know about.

CMP Yeah.

ACDR What page is it?

DMP 1-6 of the Docking Checklist.

17 34 33 DMP Vibration test is completed.

DMP Okay, Tom, I'm putting mag - magazines here, too. Then get the stuff from F-2, probably. Obtain DAC six-pack ... Okay. DAC six-pack. ...

CMP Deke?

DMP Yeah?

17 35 28 CMP On your 300-millimeter lens - Nikon setup, that's supposed to attach right in the DAC spot right on your window, huh?

DMP Yeah, right.

CMP Why the long arm, I wonder? Oh, I see. You've got to put it right back on your eye.

ACDR Okay, it says, "Obtain DAC mag. Remove mag C102 from DAC 02 in bracket 857."

CMP Right.

ACDR "And retrieve mag C103 from bag and replace with 102." Which bag? They didn't say what bag. ... got to be this Go ahead used all that one up?

DMP I don't know. I probably did.

17 36 17 DMP Okay, "Remove bag ... Retrieve mag 103 from the bag and replace with 102." That label ... there - it was in there, huh?

ACDR Yes.

DMP can't tell. ... expect ... go over there and help do that, huh? F-1 ... Okay, we got a green light. That one's all right.

ACDR Hey, Bob put in here "used and replaced" ... - -

CMP Okay.

ACDR ... activation., too.

CMP Bang! Bang!

ACDR ...

CMP Yeah.

DMP Okay, and that can go in F-2.

ACDR Is that where we put the six-pack, ...?

17 37 34 DMP No, we've been putting them in F-2. That's what we decided.

CMP This special light, Deke, that you have to ... Where do you generally find it?

DMP Oh, it would be in that - in that ... bag. ...

CMP Yeah.

17 38 06 ACDR Okay, "Obtain remaining US DAC mag." ... The color chart's next. ... pass bags - five - up to F-2?

DMP ... I think we put everything in F-2, Tom.

ACDR Okay, ... I've got - I've got the first one.

DMP Except the six-pack is the ... one.

ACDR I've got the six-pack. Then it says, "Obtain remaining US DAC mag bags - three of them - in D-3. ... Color TV charts ... five mag bags and the TV color chart ... CM. Stow the mag bags and ... color chart in R-3.

DMP Okay.

17 39 16 CMP How about ATS, Tom? Are we coming up on ... very soon?

ACDR ... Flight Plan ...

ACDR ... Yuk!

CMP ...

17 40 08 ACDR Okay, you got ... six-pack ...?

DMP Right.

ACDR ...

DMP ... Okay, one other one.

ACDR That's what it says, but I don't know what in hell they're talking about ...

DMP Maybe three - D-3.

ACDR Yeah. ... should doublecheck. ... Oh, here we are. ... Okay, then I pass you the color chart. Yeah, ...

CMP What's this ... or ... 29, over there?

ACDR That's ...

CMP Okay, do you have a bag up here?

17 41 23 DMP Okay, the color chart's goes in R-3, and everything else is in F-2. Okay, and I got to remove all the straps, covers, and et cetera and put them in D-3. Stow the portable light in TSB. ... all that stuff.

DMP I tell you one place that's cold enough, Tom.

ACDR What's that? Up there?

DMP You're damn right. We got all kinds of condensation in this ... vehicle.

ACDR ...

DMP Yeah.

ACDR Of course, it's cooled down here in the docking module ...

CMP Yeah.

DMP Hey, Vance, that checklist was right. There was another package. ...

CMP What page - How far are you from finishing that up up there now, Deke?

17 42 25 DMP Pretty close, Vance. I've got to take all these bags and stow them in the - D-3.

CMP Okay. Maybe I can - now that I've got your camera set up, I can help you.

DMP Oh, okay.

CMP But if you - ... 00, why, I won't come up.

DMP No, sir. When we do that, you're going to tell Houston, "Mark 00" sooner or later.

17 42 49 ACDR I think you have this Hasselblad for this yaw maneuver.

CMP We don't want it here, Tom, because we want to use it out the window.

ACDR Okay. Well, use it ... right window ...

CMP Well, I'd put it back in ...

17 43 23 CMP Okay. This is full. Get one of the bags - one of the bags here.

DMP In D-3.

CMP Okay. Have you got the suits ready? ... entered in ...

DMP I haven't ...

CMP ...

17 44 11 DMP ... (laughing) ...

CMP Well, if they don't get us caught up.

DMP I don't mind getting ... Okay. "Remove straps" - We stowed this portable light in the TSB. Pre-docking ...

CMP Okay, maybe if I could put this under the ...

DMP ...

CMP It will.

DMP Yeah.

17 44 47 ACDR We're going to miss this ... Man, it's

CMP Oh, that's a ...

ACDR No kidding. ...

CMP Hey are you serious?

ACDR Okay. This thing comes up at - we haven't got the docking system checked out; we haven't got the instruments cal.

CMP We've got to find out what Houston would rather do, I guess.

DMP ... the tapes we can do later; ... equipment filing tapes. We could hold out ... tape measure, Tom.

ACDR Yeah, sure.

17 45 26 DMP And I think probably we could determine bias and get the star cal in Earth light. Don't you think?

ACDR Yeah, sure.

CMP I've got this camera set up, so we - -

DMP ...

CMP - - whenever you get that over with.

DMP Let's see, that's 6 degrees in ... at - yaw ... I'm about at the end of this thing, Vance.

CMP Okay. That just about covers everything.

DMP Yeah.

17 46 04 CMP I'm going to get one. Is the right ... in front of me?

DMP Yeah. You're there.

CMP ...

ACDR Have you got the ... and the tape recorder set up, Deke?

17 46 21 DMP Yeah. I passed those on. We've only got one problem. The God damned shroud cover was locked in ... No good son of a bitch! I don't know what that's going to

17 46 45 DMP I guess when ..., it's just my time.

TIME SKIP

19 34 11 CC-H Apollo, Houston. We're about to go S - LOS from MILA. Once you get locked up on the ATS right here, we'll pick you back up.

19 34 22 CMP ...

ACDR ...

19 37 20 ACDR ... what you had here. You got a map - we have mapping pass. Yeah. I - I - I had it out here, you know. ... I have the Earth Ops book.

ACDR ... the Hasselblad ... that's the TV.

19 39 35 (Whistling)

ACDR Okay. All right. ... 3, 4, and 5.

ACDR Yep, yep ... I got ... What you need is the cameras out and ...

19 42 23 CC-H Apollo, Houston through Madrid.

ACDR Loud and clear.

CC-H Hey, Tom. Have you been trying to lock up the ATS?

ACDR Roger.

CC-H Okay. Let us read these 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.

19 43 01 ACDR ... 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 25 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 Pitch, minus 7 and yaw, 313.

19 44 01 ACDR Okay, we've got ... should have ATS now.

19 44 05 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 51 CC-H Apollo, Houston. I've got a preliminary PCM pad for you when you're ready to copy.

TIME SKIP

20 30 51 CMP Okay, right down at the bottom. ... 21.4, 1; 24.3, 2; 29.1, 3; 35.1, 4; 35.1, 5, too; 33.8, 6.

20 32 13 CMP 7 is ...

TIME SKIP

21 08 46 CMP There it was.

21 09 04 ACDR ... All right. Yep ...

TIME SKIP

21 59 57 DMP Man, those snow-covered peaks ... clouds.

ACDR ... looks like ...

22 00 46 DMP I hear that water's rougher than hell when there's ice in it. There's all kinds of white ...

ACDR Yeah.

DMP ...

ACDR That's caused by the ...

CMP You got what?

ACDR ... under the clouds. Bunch of ...?

22 02 07 DMP ... if you can see the surf down there, Tom.
ACDR Yeah.
DMP ...
ACDR ... way out here. Not there, not there. ...
ACDR ...
22 03 09 ACDR I saw a kind of a ...
ACDR All right. Okay. I'll - That's okay. You guys
finish it and I'll take care of it.
22 03 34 DMP Earth obs, rev ...
*23 02 47 ACDR Oh, yeah.
*23 04 37 ACDR Yeah.
*23 06 54 DMP Yeah. ...
USA (Sneeze)
*23 14 57 CC-H Let's see if we can get locked up on ATS.

#

*Time of dubious validity.

DAY 198

01 03 57 ACDR ... Yes. ...
01 05 31 ACDR One thing I want to do ...
01 07 21 ACDR Yes. ...
DMP ...
01 08 23 ACDR Yes. ...
01 09 27 ACDR Let me have that.
01 10 33 ACDR ...

TIME SKIP

01 36 03 CMP ...
01 36 17 CMP Huh? Yeah. I thought I did very well.
CMP ... even helped ...
01 37 22 CMP Deke, make sure it's ...
CMP Yeah. ...
DMP How big was ...?
CMP 85. But I haven't ...
CMP Yeah. Here's the ...
01 37 48 CMP Yeah. I ... that one has more ...
CMP Yeah. We got ... Well, we'll do that.
01 38 27 CMP Either one of us have ...?
CMP Yeah. Never ...
CMP ...
01 39 59 ACDR Just above ...

TIME SKIP

07 05 07 MCC-M (Roger. Repeat the last ones, please.)

07 06 26 USSR (6 ... 070 T1, yes and 155. Here also 11, 10, 40, 12, 40, 3, 16, 14, 04, 43, 15, 36, 55, 17, 09, 27, 15, 36, 50, 20, 08, 59, 21, 36, 50, 20, 08, 59, 21, 37, 50, 22, 52, 59, 00, 25, 22, 01, 57, 24, 03, 29, 49, 05, 03, 16, 06, 38, 12, 29, 47, 08, 09, 20, 54, 10, 53, 20, 12, 25, 48 - 12, 25, 58, 13, 47, 22, 20, 19, 30, 19, 52, 02, 18, 1g, 19, 19, 46, 09, 21, 19, 02, 22, 37, 35, 00, 07, 45, 01, 39, 47, 03, 12, 1, 04, 45, 41, 06, 20, 43, 07, 29, 21, 09, 03, 08, 10, 35, 32.)

MCC-M (... by a ... of communication, yes?)

07 16 02 SCDR Apollo, Soyuz. How do you read me?

DMP (Good morning, Alexey, ...)

SCDR Deke, where's Tom?

DMP (Soyuz, Apollo. How do you read me?)

SCDR Read you loud and clear, Deke.

DMP (We also read you well. How are you?)

SCDR Hey, Deke.

DMP Yeah, this is Deke.

DMP (...)

SCDR Well - -

DMP ...

SCDR How you feeling today?

DMP (... , Alexey, ...)

07 17 07 SFE The tunnel 2 is 280 now. In orbital module, it's okay.

TIME SKIP

08 06 56 CMP Yeah, it looks like we might. I can hear a hissing.
08 07 02 CMP Houston, Apollo.
CMP Houston, Apollo on ATS.
CMP Pretty good, Crip. I've got a little something to report to you here.
08 07 32 CMP Well, at 43:20, approximately, we got a ...

TIME SKIP

11 30 24 ACDR Loud and clear. Go ahead.
CMP No. I can't get it.
ACDR You can't reach back there? Do you want to ... around to the mike? ...
CMP ...
ACDR ...?
CMP Yeah.
CMP ...
ACDR ...
CMP ... I haven't seen them either. ...
11 32 14 ACDR 47:22 ... Loud and clear.
ACDR We're maneuvering into that attitude now with a VERB 49. We don't have too far to go.
ACDR Houston, Apollo. How do you read?
CC-H ...
ACDR Go ahead, we read you loud and clear.
ACDR Hello, Houston; Apollo. How do you read?

11 32 55 ACDR ... Houston, Apollo. We read you loud and clear.
How us?

11 33 03 ACDR Roger, Houston. We read you loud and clear. How us?
ACDR Houston, Apollo. How do you read?
ACDR ...
ACDR Hello, Houston. This is Apollo. We've been reading
you loud and clear. Over.
ACDR Hello, Houston; Apollo. How do you read?
CMP Okay, are you guys ...
ACDR Do you have to take that off before you can ...?
CMP That's right.
ACDR You do, huh?

11 34 18 CMP Mainly because of the interference with the ...
ACDR Houston, Apollo. ... ATS.
CMP ...
ACDR I don't know.
CC-H ..., Houston. How do you read?
ACDR There they are.
ACDR Loud and clear.
CMP Okay. ... put that in?
ACDR Yeah.
CMP Okay. I can stick it in, if you want. Doesn't
matter.
ACDR Deke, why don't you ... ahead while Vance goes ...
pretty fast starting from now on.

CMP Yeah. Okay, tape recorder, shot 50 was of - 53 were of the Cairo area. Stereo, three picture, and a fourth one looking back, and finally - the last one was the west coast.

CMP Okay.

CC-H ... TV picture ...

ACDR All right. Stand by.

CMP ...

ACDR ...

11 44 30 CMP That's what I need to do.

ACDR ... Polaroid ... get it on here.

CMP ...

CMP Oh, I see ...

ACDR ...

CMP Okay.

CMP Okay. We'll rotate it, Dick. And let us know.

CC-H Okay. ...

CMP Tell you what, I'll ...

11 45 30 ACDR Yeah. How's that look?

ACDR Hang on, Dick. We're trying to get hatch 1 back up ... dicker with the TV camera.

CC-H Okay, Tom. ...

ACDR ... get that hatch up out of the way first. ...

ACDR Wrong way. The other way. It opens and closes ...

11 49 34 ACDR Deke, why don't you use Myrtle while you're down there, and then I'll follow.

ACDR I got it covered.

CMP ... the Russians ...

ACDR I don't know, it could be.

11 50 55 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. ...

ACDR ...

ACDR What?

ACDR Okay. I'll ...

ACDR Houston, are we over Russia now?

CC-H ...

11 52 21 ACDR Okay. They've got a forest fire on top of a mountain that you can sure see at this point.

CMP See some - a contrail, too. See that contrail?

ACDR Yeah.

CMP It looks like pretty rugged country, this part of the world right here - a lot of mountainous country.

ACDR Well, Dick, ... watch the TV out the window then?

CC-H ...

ACDR Rog. You got a pretty picture on it out the window?

CC-H ...

ACDR All righty.

CMP You see that big circular - cloud up there?

ACDR ...

CMP Yeah.

ACDR Okay, I'll ...

CC-H ...

11 54 02 CMP On the average, how's it look now? And, we're giving you all the light we can ...

CC-H ...

CMP Hey, you want to use Myrtle?

ACDR Yeah.

CC-H ...

ACDR Okay.

11 55 31 DMP Okay, BMAG 1 ... WARM UP, and ... LINE HEATERS. We've got it on, huh?

DMP Hey, you know how long it's been on ...?

CMP Yeah, since we got up.

DMP The LINE HEATER?

11 55 55 CMP Oh, I thought you meant the BMAG 1.

DMP No. The -

CMP Light ...?

DMP ...

CMP No. It didn't either ...

11 56 18 CMP Okay. What is it, 47:56?

DMP Yep.

CMP Okay. Let's go to P32. ...

DMP ...

CMP Okay. ... Okay. ... Okay.

11 57 33 CMP Man, look at all the stars.

 DMP Yeah. Little one ... Orion ...

 CMP We have a lot of sparklers outside the spacecraft from
an effluent dump. We ... Looks like a snowstorm out
there. ...

 DMP ...

 CMP Isn't that amazing?

 CMP Tom, you urine's really turned into a snowstorm out
there.

 CMP Okay.

 DMP Okay. We'll get to it.

11 59 29 CMP ... supposed to shortly do?

 DMP Wastewater dump.

 CMP That's right. ...

12 00 10 CMP ... see the water down there. ... island.

 DMP ... big one over there.

12 00 30 CMP Yeah, I'll bet you it's ... See the lights down
there? ...

 DMP Ah - ... VENT, Tom, I think ... OFF.

 CMP We leave it VENT for a few minutes, then we can turn
it off. And leave vent on on Myrtle, too. If you
leave Myrtle on. Yeah. Myrtle on vent and the dump
on for a while.

12 01 02 ACDR Okay.

 CMP Okay. Here's the ... NOUN 84 is 33.5.

12 03 32 CMP Verify delta-V is 7.

 CMP ... we're going to load 11002.

CMP ...

CMP Seems to me like we might as well do it now.

12 04 47 ACDR ...

CMP Maybe we can get a ... from the COAS.

ACDR Okay.

ACDR ...

CMP ...

CMP ...

ACDR ... but I'm looking.

12 06 51 CMP Yeah. It'll look ...

ACDR ...

12 06 58 CMP Oh, okay.

ACDR They want it in RECORD, huh?

CMP Yeah.

ACDR Okay, and all balls.

CMP Boy, that thing ...

ACDR ...

CMP ... 47 ... 47, 47, 2.

12 08 11 CMP ... back to AUTO.

ACDR AUTO.

12 08 23 CMP Back to POO.

ACDR Okay. Next thing coming up is ...

CMP Yeah. Why not try right now.

ACDR Okay. Let's ... VERB 49, all ...

CMP Yeah. All of them.

12 09 26 ACDR ... CMC, AUTO.

ACDR ...?

CMP Okay. Either way.

12 10 09 CMP Okay. And I'm ... off on the first ...

ACDR ... No, ...

12 10 48 CMP Oh, Tom?

ACDR Yeah.

CMP You put any water through Myrtle?

ACDR Oh, no I didn't.

CMP We ought to.

12 13 13 ACDR Here they are.

CMP Oh ho! Okay.

ACDR ...

CMP Okay; let's see ... 36. Really good, huh?

ACDR ... Okay.

12 13 48 CMP Okay. And we're ready for you to go MIN IMPULSE, ..., and I'll stand by for the burn.

ACDR Okay. ... CMC in FREE ...

ACDR Stand by. Stand by.

12 14 20 ACDR MARK. Right on.

CMP ... Okay ... I guess that's another ...

ACDR Okay. ...

CMP Okay.

12 15 05 ACDR MARK it.

CMP Easier than the simulator?

ACDR ...

ACDR Stand by.

12 15 37 ACDR MARK it.

CMP How about one more?

ACDR Stand by.

12 16 09 ACDR MARK it.

12 16 27 CMP Okay. You got it.

ACDR (Laughter)

CMP And POO; CMC, AUTO.

ACDR ... CMC, AUTO ...

12 17 54 CMP Okay. Starting the maneuver. Oh. ... do that ma-
neuver at 48:10. We're not going to get them on the -
are we doing this early?

ACDR No. ...

CMP We won't get them on ATS, they're on - Let's see, let
me look. The thing we have trouble with is the noise
level.

ACDR ... When we pick up ATS.

12 18 23 CMP Okay. We could pick it up later. Okay. I guess it
does no harm.

12 18 31 CMP Okay. Let's do some other maneuvering.

ACDR How's those angles?

CMP They look good. Very good. Okay. You got ...
65 ...

ACDR Yeah.

CMP Okay. I'm getting the Velcro.

ACDR ... God damn. We're looking for this stuff.

MS (Laughter)

12 19 20 CMP No, you guys ...

12 19 31 CMP ...

12 19 56 CMP ...

TIME SKIP

13 31 56 ACDR Houston, Apollo. How do you read?

 CMP No contact ...

 USSR 4 minutes.

 ACDR Okay. We're getting up to 3 minutes to the burn.
Read me back through your S-band.

 CC-H Okay. I copied.

 CMP No contact.

 USSR 4 minutes.

13 32 05 ACDR Okay. Well, I'm getting up to 3 minutes to the burn
here. Why don't ... through your S-band?

 ACDR I've got everything on VHF.

13 32 17 ACDR All right.

 DMP I'm hearing them talking, I think ...

ACDR I've got them both ...

13 32 28 CMP Okay, Deke, ... Check the ... P34 ... 13, 21, ... 0.

ACDR Yeah, ... got a little bit ...

ACDR ...

CMP Can't get everything down though, probably.

13 33 28 ACDR Yeah. ...

CMP ...

ACDR ...

13 34 14 CMP Okay. NORMAL. You got it.

ACDR ... ullage.

CMP Yeah. 7, 6, 5, 4, 3, 2, 1 -

13 35 10 CMP BURN.

13 35 12 ACDR Okay, here we go.

CMP Sure enough.

13 48 33 SCDR Okay. Okay; 100 miles.

SCDR Tom, how do you read me?

13 49 02 ACDR (We read, Alexey. How me?)

SCDR I read you loud and clear. I am very glad we have good comm with Apollo. We have a saying, "it's better to see once than to hear twice."

ACDR (Good ...)

SCDR It's very good to hear you again, Apollo.

ACDR (... comrade.)

13 49 32 SCDR We are glad to check comm of the joint international space radio line. We are ready for talking.

ACDR (Roger.)

14 03 07 ACDR ... Deke ...
ACDR Your calculations ...
14 04 34 SCDR Okay. How should I say? I'm very glad to greet
you, very glad for you. Okay. We said everything's
okay onboard Soyuz.
CMP (Regards ... hear me.)
SCDR ... now.
14 05 46 SCDR Okay. Roger. How are you feeling today?
14 10 45 SCDR Apollo, Soyuz. Beacon off.

TIME SKIP

14 30 23 CMP Stand by. ...
14 30 45 CMP Works out, G&N total delta-V was minus 13, and then
... to 9.8. I'm sure it was 9 point something.
ACDR ...
CMP ...
DMP ...
14 32 25 ACDR Okay. Stand by. We're in the middle of the snack
period now. We'll take a look. I don't want to ...
too much light coming up for rendezvous ...
ACDR Okay, side window ...
CMP ... the CM.
ACDR That was a ...
DMP ...
CMP ...
DMP ...
CMP What are we over right now.

ACDR ... , I'll tell you that.

DMP ... TV working down there, Dick?

14 36 16 CMP Marking is really ... Dick. The computer ... really know where we are.

14 36 53 CMP Well, I think we're over Africa.

14 43 23 DMP Look at that ...

CMP ...

DMP Yeah.

CMP ...

14 44 30 ACDR Okay, Dick. We must have got out of the area there where all the transmission - we could hear it both in French, English, and a little bit of Russian. Our tracker - our VHF is locked on good now. Okay, ... the docking attitude pad, is that going to be nominal ...

CMP ...

14 45 11 ACDR ...

14 45 26 SCDR Apollo, Soyuz. ...

TIME SKIP

15 09 25 CMP Okay.

ACDR ... don't ... for me ...

DMP Yeah.

15 15 04 CMP Okay. TV switch list 1-19.

ACDR ... same ...

15 15 10 CMP Okay.

15 18 53 ACDR (Soyuz, Apollo. How do you hear us?)
 SCDR We read you ...
 ACDR ...

15 19 16 SCDR Roger. We read you clear.
 ACDR ...

15 19 21 SCDR Okay.

15 27 34 SCDR Roger. 10 miles.
 ACDR Are the ... on schedule? ...

15 27 54 SCDR Roger.

15 31 01 ACDR (Soyuz, Apollo ...)

15 31 07 SCDR Roger. TK-1 completed.

15 31 33 ACDR Alexey, Valeriy, (...)

15 31 43 SCDR Orientation lights on.
 SCDR Roger. ... miles.

15 37 21 SCDR Apollo, Soyuz beacon is off. Soyuz beacon is off.

15 39 15 SCDR ...

15 40 33 SCDR Roger ...

15 42 03 SCDR Roger ... 2 miles.

15 45 06 SCDR I have you 1 mile.
 SCDR Roger. ... meters.

15 53 38 SCDR Roger. 100 meters.
 SCDR Roger. Apollo stationkeeping.
 SCDR Go ahead.

15 54 19 SCDR ... 51444759.

CMP (...)
 15 54 34 SCDR Roger.
 15 55 00 ACDR Yeah. Okay ...
 15 55 07 SCDR Apollo, Soyuz. Hatch number 5 is closed.
 15 55 17 ACDR ...
 15 56 48 CMP Okay. You're coming on ... You're - -
 MS ...
 CMP Okay. Deke, if you get a chance, could you tell me
 what the camera setting is supposed to be.
 DMP Okay.
 CMP Okay. On TV camera ... camera AVERAGE, SLAVE, and
 LINEAR ... Okay. Have you got that ...
 DMP All set ...
 CMP Okay. Did you get the ...? Got the camera. ... I
 got that. AVERAGE, SLAVE, LINEAR ...
 DMP Okay - -
 CMP ...
 ACDR (That's a good ...)
 SCDR Thank you, Tom. Thank you.
 15 58 15 ACDR Did you ...
 CMP Coming up ... 15 degrees of ... 38.
 ACDR ...
 CMP Okay. ... ATS pickup, minus 36 and ... 4.
 ACDR ...
 15 58 42 CMP Okay. We got it extended.

15 58 57 CMP Okay ...
ACDR ...
CMP Yep. Okay. You want me to ... up? You might as well ...
ACDR ...
CMP Okay. Yeah, I can't get ... this attitude right now ...

16 00 08 ACDR Houston, how do you read?
ACDR Loud and clear. How do you read?
ACDR Crip, you should have a good TV picture.
CMP Okay. TV has to be - -
DMP And we have the guide ring extended.

16 00 57 CMP Okay. Yeah, what we need is minus 2225 ... Maybe the thing to do is take the camera off for a second.
CMP Okay.
DMP Stand by.

16 01 37 CMP Okay. ... infinity.

16 03 31 CMP And, Dick, we have two lights, SM RCS B and D.

16 04 44 ACDR (Soyuz, please tell us when you begin your maneuver.)
ACDR (Soyuz, this is Apollo. How do you read?)

16 05 02 SFE I read you 5 by 5.
ACDR (Yes, please tell us when you begin your maneuvering.)

16 05 13 SFE We're initiating rotation maneuver. You see?
ACDR (Yes, very slowly.)

16 05 24 SFE Inertial orientation initiated.
ACDR (Roger.)

16 05 30 SCDR Soyuz docking system is ready.

16 06 47 SFE Tom, I see your spacecraft.
ACDR (Yes.)
ACDR (We see it. It's very beautiful. We see your periscope.)

16 07 08 SFE It's a good picture.

16 07 28 SFE Tom, roll maneuver is completed.
ACDR (Roger.)
SCDR Inertial orientation established.
ACDR (I'm approaching Soyuz.)
SFE Come in, Tom.

16 07 52 SFE Tom, please don't forget about your engine.
ACDR (Laughter) ... Yeah.

16 08 18 SCDR Inform us about range rate.
ACDR (Very good; 1/2 meter.)
ACDR (Less than 5 meters distance.)
SCDR 5 meters.

16 08 55 ACDR (3 meters.)
ACDR (1 meter.)

16 09 03 SCDR Roger.

16 14 53 SCDR (Moscow, Soyuz. Do you read me?)
CMP ... a Mayday.

DMP ... latest calling code.
16 15 02 CMP Yeah.

TIME SKIP

19 09 51 ACDR Houston, Apollo. We've completed step 20, and they're working on step 21.
ACDR Roger.
ACDR Okay. ...
CMP Yeah.
ACDR You talking to me?
ACDR You want to get your - -
DMP I didn't hear your message there, Bo.
DMP Okay. You're talking about that camera. Oh.
ACDR Yeah.
DMP Okay.
19 11 10 DMP You didn't like the picture we had on the other one, huh? (Laughter) We can't fix that.
19 11 27 ACDR Okay. And 37. He's at 40 right now.
19 11 44 ACDR (Soyuz, this is Apollo. Now hatch 4 is open? Over. Roger. Roger.)
ACDR Oh, okay.
DMP Hey, that's beautiful. ...
ACDR Okay. ... (...) ...
ACDR I didn't hear you transmit.

DMP Yeah. ...

ACDR (Is it open?)

19 12 38 DMP Okay. We think they said hatch 4 is open, but we're standing by to confirm it.

CMP Roger, Bo. Let's give it a check.

19 12 52 DMP (Soyuz, this is Apollo. Hatch 4 is open?)

ACDR Something's shaking.

19 13 03 CMP Okay, Bo, the configuration looks good.

ACDR Oh, hell, that's the damn thrusters.

DMP (Soyuz, this is Apollo. Is your step 22 finished - completed? Over.)

DMP I think that's those guys shaking around there.

CMP Okay. The PHONE/MIC INTERCONNECT is ON. The F - VHF FM is on RECEIVE. And the setting's about 5.

19 13 48 ACDR How's that pressure?

DMP Well, it's staying right there. ... they're having trouble with their hatch.

ACDR (Soyuz, this is Apollo. How do you read me?)

ACDR (Roger.)

DMP Good show.

19 14 09 ACDR (We're now working on step 23, and we are equalizing the pressure between the Soyuz and the docking module.)

CMP Hey, Deke?

DMP Go ahead, Vance.

CMP Did you want panel 6 MODE to VOX to adjust sensitivity?

ACDR Okay. It's open, Deke. ... It's open.

19 14 29 DMP Yeah. Oh, boy, we might have missed a step here
in - -

CMP We sure did.

DMP - - the comm configuration, Tom.

19 14 32 CMP Okay. You got it. How's that?

DMP ... we jumped ahead.

CMP Okay. Let me put it to VOX.

19 14 58 DMP Oh - somewhere.

ACDR Back, back, back, back.

CMP It's right around - "Prepare Apollo TV."

DMP I think on the time ... 41 minutes. I don't think
we're to it yet.

CMP Okay.

CMP Let's see, the time is - -

DMP Yeah, it was here. Yeah. Right.

CMP Okay.

DMP Okay.

19 15 29 CMP About 52, I guess.

ACDR Okay, here we go. Now ask him to do it.

DMP Okay. But we got the valve open?

ACDR We got the valve open.

DMP Okay.

19 15 46 DMP - - panel 6, MODE to VOX.

CMP Okay, VOX -

DMP VOX sensitivity as required - approximately 7.

CMP Okay.

DMP On panel 98 - thumbwheel VOLUME down to eliminate squeal.

19 15 56 CMP Okay. You got it.

DMP Great. Okay, that did it.

19 16 00 ACDR (Soyuz, our step 23 is completed. We are now working on step 24.)

DMP Yeah. We're through with that, too, Tom.

DMP Right here - 25. Ready to open - Here, let me get the light on.

ACDR ...

DMP ... camera. Just a sec. Yeah. We're right on schedule. Okay, there.

ACDR Okay. Go to unlock.

19 16 28 DMP The camera is running.

DMP Okay. Right on schedule.

DMP Perform hatch opening.

DMP No. ...

ACDR (Soyuz, how do you read?)

DMP Are you hearing us?

ACDR (I am ready to open hatch 3.)

DMP You reading us, Bo?

19 17 05 DMP Okay. Well, we're not reading them much either.

ACDR We - we can read them - a little bit.

19 21 34 ACDR-OM Yeah.

ACDR-OM Yeah.

MS (Laughter)

19 22 06 ACDR-OM How do you read me?

USSR ...

SCDR-OM (Moscow, this is Soyuz. Read you very well.)

USSR ...

SCDR-OM ...

USSR Tom, ...

SCDR-OM Okay. ...

DMP-DM Tom, are you ready for the camera ...?

19 25 45 CMP-CM Are you reading Soyuz now?

ACDR-OM Hold onto that.

CMP-CM It's all down there. ...

CMP-CM Houston, how's your comm now?

CMP-CM And Soyuz?

19 26 57 SCDR-OM (Moscow, this is Soyuz. How do you read?)

SCDR-OM (I read you well. We are very grateful and excited by these warm words. And we will work even better.)

SCDR-OM (Thank you very much.)

CMP-CM Okay, Tom, I guess -

ACDR-OM (Roger.)

SCDR-OM (Everything is nominal, George. Have you turned off the other camera?)

SCDR-OM (Once more we would like to thank you for these warm words and would like to say, in answer, there is so much to say, and we have so little time.)

ACDR-OM (Yes.)

CMP-CM Bo, you reading us?

19 28 42 ACDR-OM Houston, Apollo, how do you read?

ACDR-OM Okay. Do you want Deke to give his headset now to Alexey?

19 30 40 ACDR-OM Okay. ...

ACDR-OM Okay. Let me see.

DMP-OM I think we can get it, Tom, so it won't ...

ACDR-OM Okay.

ACDR-OM ... for awhile ... Bo, how's your picture?

ACDR-OM Okay. ...

ACDR-OM Okay. That all right, Bo?

CMP-OM Yeah. She's wide open.

19 34 40 ACDR-OM It's wide open.

ACDR-OM Okay. ...

ACDR-OM Okay.

ACDR-OM Okay. We got - Alexey's on Deke's headset. How do you read, Houston?

ACDR-OM Understand. And Alexey has on Deke's headset.

ACDR-OM Yes, sir, Mr. President, I sure do. Out of the three docking systems I've used, this was the smoothest one so far. It worked beautifully.

ACDR-OM Well, it's a lot - -

19 39 36 SCDR-OM Mr. President, I'm sure that our joint flight is the beginning for future cooperation in space between our countries. Thank you very much for very nice words to us. We'll do our best.

ACDR-OM Okay.

DMP-OM No, sir, Mr. President, unfortunately.

ACDR-OM ...

19 41 19 DMP-OM Well, Tom just repeated it for me, sir. Well - yes, I have a lot of advice for young people, but I guess probably one of the most important bits is to, number one, decide what you really want to do and then, secondly, never give up until you've done it.

DMP-OM Okay. Yes, sir, it -

CMP-CM Mr. President, I'm - I believe it really has. I think, in a way, our project in - in particular, the training that we've undergone, has been a - sort of a model for future, similar projects. I think it's been a real pleasant experience to work on learning Russian and to be able to work with the cosmonauts, and I think we'll have some ideas that would probably help people in the future on similar tasks.

SFE-OM We having good spacefood. There are some Russian soup some Russian ... (laughter), some juice, some coffee, and a lot of water (laughter). No beer; no crab.

19 45 31 SCDR-OM Thank you very much.

ACDR-OM Thank you, Mr. President. It's certainly been an honor to serve the country and work here.

ACDR-OM Yes, sir.

ACDR-OM Deke?

DMP-OM ... Yeah.

19 46 47 ACDR-OM Okay. And that ... it. setup. You've got that set up ...?

ACDR-OM Houston, Apollo. Okay.

ACDR-OM Okay. You're ready for the presentation now, and how much more time we have on ATS, Bo?

ACDR-OM (Yes.)

ACDR-OM Deke, come on down.

DMP-OM Okay.

ACDR-OM We got 10 minutes here, and we'll do it real fast.

ACDR-OM Just a minute ...

19 48 24 ACDR-OM Right. Okay, Deke. Put on your helmet.

ACDR-OM Put it on TV.

DMP-OM Ready?

ACDR-OM ... (Laughter)

ACDR-OM (Alexey, Valeriy. Permit me, in the name of my Government and the American people, to present you with five flags for your Government and the people of the Soviet Union. May our joint work in space serve for the benefit of all countries and people on the Earth.)

SCDR-OM Your people ...

ACDR-OM Thank you very much, Alexey, thank you. (Thank you very much.)

ACDR-OM Roger. (Houston, says that - that they still don't hear you very well. Check your VHF FM.)

19 50 30 ACDR-OM Valeriy's checking it right now, Bo.

ACDR-OM (Yes.)

SCDR-OM Houston, Soyuz. How do you read me?

SCDR-OM ... Soyuz. How do you read me?

ACDR-OM Did you read Alexey then?

DMP-OM Yeah. ...

ACDR-OM Right.

DMP-OM If we're supposed to be on VOX, Bo, I think that's part of the problem. We're - we're ... or else not keying.

ACDR-OM (A very long day.)

SCDR-OM ...

ACDR-OM A very long day.

SCDR-OM ...

19 51 37 DMP-OM Yeah, we'll try that.

CMP-CM Can we turn up your VOX a little bit, Deke? That may help.

DMP-OM Oh, okay.

SFE-DV ...

ACDR-OM You got it okay. Valeriy's checked the VHF FM and he said it's ON. (Please speak in your headset.) Oh, ...

SCDR-OM Houston, Soyuz. How do you read me?

19 52 11 SCDR-OM Just now, Tom Stafford gave me - gave us little flags from American people and the - from American Government. Thank you very much for these very expensive present. Soyuz crewmen - gave Soyuz flags to Tom Stafford from our people and from our Government.

ACDR-OM (Thank you, Alexey.)

SCDR-OM A very long day, about 2-1/2 ...

ACDR-OM (Yes.)

MS-OM (Laughter)

DMP-OM Yeah.

19 53 02 DMP-OM ... me to help you?

ACDR-OM In AVERAGE not PEAK. Okay, in work. Is this over there?

DMP-OM I don't know. I can try it. ...

ACDR-OM There it is.

19 53 41 DMP-OM You get two choices there, Bo. Which one do you like?

ACDR-OM Lots better on the monitor.

DMP-OM That's better.

SCDR-OM ...

ACDR-OM Is that better, Bo?

DMP-OM Okay.

ACDR-OM What was it in?

DMP-OM Well, ... what I just put it in.

ACDR-OM (Laughter) Look at that in the monitor.

ACDR-OM Here you go. ... This goes in here. ... okay we got that done.

19 54 19 DMP-OM Okay ...

ACDR-OM ...

DMP-OM Right.

DMP-OM Hey, Tom? We got out U.N. flag?

ACDR-OM Stow flags in TSB.

DMP-OM Okay.

ACDR-CM Ha.

DMP-OM Huh? ... take that film.

19 55 40 ACDR-OM Roger. 1:38 transfer time.

DMP-OM Okay. What do we do next here, Thomaso?

ACDR-OM What time do you have?

DMP-OM I got 36:26 ...

DMP-OM Tell you, Tom, I think - I'll connect those connectors here ...

19 56 57 CMP-CM Roger. 181 the three TV POWER switches OFF.

ACDR-OM Cables come next.

DMP-OM Okay.

CMP-CM Okay. That's complete, Bo.

ACDR-OM Okay.

DMP-OM Okay. I'll look up the ...

ACDR-OM Okay.

CMP-CM Hey, Tom and Deke, how's dinner?

DMP-OM Oh, I don't know there. Haven't got to it.

ACDR-OM Oh, that's right. We're still - -

19 58 17 CMP-CM That's right. You're still getting ready to connect cables and stuff.

ACDR-OM Yeah.

DMP-OM Right.

ACDR-OM Yeah. We're a little behind on the cable connections here, and we'll get up and do that - -

CMP-CM Yeah. Hey, did you - did you get a call from the Soviet leaders? I never picked up.

19 59 34 ACDR-OM Yeah, we got a call, but it was just a - kind of an
... up to the - both crews.

CMP-CM Kind of a speech thing?

ACDR-OM Right. It was a speech by Secretary Breshnev ...
both crews.

CMP-CM Um hum.

ACDR-OM But I had the feeling Alexey ... to hear it.

CMP-CM I see.

DMP-OM Hey, Vance, I heard - I ain't heard nothing ...

CMP-CM Right. I - I didn't think I did either so I was a
little - -

ACDR-OM ...

DMP-OM Okay. And I'm suppose to put TV camera back in A-7.
This right? Camera in ...

DMP-OM ... verify.

20 00 01 DMP-OM Okay, Vance. I guess we got another comm configura-
tion here.

CMP-CM Okay. I'm standing by.

20 00 11 DMP-OM Okay. MODE INTERCOM, PUSH TO TALK, and VHF AM ...

CMP-CM Okay, PUSH TO ... and VHF AM ... FM ... FM ...

DMP-OM Want the AM OFF.

20 00 30 CMP-CM And AM is OFF.

DMP-OM Roger. ... NORMAL and POWER, OFF.

20 00 33 CMP-OM NORMAL.

DMP-OM And POWER, OFF.

20 00 38 CMP-CM ... POWER, OFF ... Oh, POWER, OFF. Okay? Right.

20 03 11 CMP-CM (Soyuz, Apollo.)

SCDR-OM Go ahead.

CMP-CM (You all ready; your cabin?)

20 06 00 SCDR-OM ..., Vance?

SCDR-OM How do you read me?

CMP-CM Loud and clear, Alexey. (Are you ready?)

SCDR-OM Yes.

CMP-CM ...

SCDR-OM ...

CMP-CM Okay, how do you read, Dick - Deke?

DMP-OM Okay, I got you now.

ACDR-OM Got you loud and clear, Vance. How us, okay?

CMP-CM Yeah, loud and clear.

DMP-OM Okay, I'll go ahead and ... Soyuz power DM breaker ... power ... there.

20 06 54 DMP-OM Okay, AUDIO 1, POWER, OFF. ...

20 07 47 CMP-CM Okay, Deke, how do you read now without ...?

ACDR-OM Okay, Deke, ... hooked up?

DMP-OM Okay. ...

ACDR-OM All right.

DMP-OM ... VOX.

ACDR-OM (Laughter) ... Tampico ...

ACDR-CM Let me help you. ...

DMP-OM (Laughter)

DMP-OM Take one thing at a time here and we may ...

20 09 05 ACDR-OM Okay.

20 15 12 ACDR-OM (Laughter) ...

20 15 30 CMP-CM (Alexey, are you ready for inertial orientation?)

20 15 40 CC-H Apollo, Houston. We're going over the hill here at Vanguard. We'll see you at MILA at 17:00.

CMP-CM Roger.

20 15 49 SFE-OM We're ready for orientation.

CMP-CM (All right. We will be doing inertial orientation.)

DMP-DM Okay. When you're ready, Tom.

20 16 04 ACDR-CM Yeah, I'm trying to - get this thing fixed. ...

20 17 06 DMP-DM Okay, Tom. Whenever you want it, I've got the TV cable with the adapter on it for you.

20 17 14 ACDR-OM Okay. You got the adapter and all that?

DMP-DM Yeah.

ACDR-OM Would you like to install it? ...

DMP-DM Yeah; I'll just go up there and do it. ...

ACDR-OM ... a 180 here.

DMP-DM Okay.

20 17 35 ACDR-OM (Laughter)

DMP-DM ... 180 ...

DMP-DM Okay. And, Vance, if you're reading me - you're supposed to select SLAVE on the CM camera.

20 18 32 CMP-DM Okay. SLAVE now.

20 18 40 DMP-DM Okay. I unstow ... Now, let's see ...

20 18 59 ACDR-OM Okay; POWER, ON. Now - (Laughter)

DMP-DM Yeah. I got this whole bundle of ... adapters, whenever you want ...

ACDR-OM Okay. I got a feeling - have you got a thing on your checklist where I install this TA-3 with the ...?

DMP-DM Ah; let's see -

ACDR-OM You're looking for step 33, Deke, but it doesn't say what - what ... reroute cable as required, but it doesn't say what to put on the ...

DMP-DM ... required. No, it sure doesn't. Ah - no, wait a minute - Reroute cable -

ACDR-OM That's all it says.

DMP-DM ... cable ...

20 20 01 ACDR-OM What happened, we had an interference with ...

ACDR-OM Ah ... Can you move that ... a little bit? ...

20 21 33 CMP-CM (The first maneuver has been performed. Orientation established.)

SFE-OM Roger. Apollo maneuver is completed.

20 21 42 SCDR-OM Apollo-Soyuz maneuver is - are completed.

CMP-CM (Exactly.)

20 22 32 DMP-DM Tom, you're about to get your second biggest thrill of the day.

ACDR-OM What's that?

DMP-DM Well ... I got to get over ...

ACDR-OM (Laughter) Good.

20 23 04 ACDR-OM Let me get out of - I'll get out of your way - here - -
DMP-OM Okay.
ACDR-OM Here do you want me to take that?
DMP-OM Yeah.

20 23 09 ACDR-OM Much better than the mockup.

20 23 36 DMP-OM AUDIO 2, ON; verify ... Okay, Vance. I'm supposed
 to power up the old speaker box here and check the
 volume as required with a comm check.
CMP-CM Okay.
DMP-OM Give us a little bit of help in there, we'll try it.
CMP-CM All right.
DMP-OM ...
DMP-OM Okay; how do you read, Vance?
CMP-CM I read you plain.

20 24 06 DMP-OM All right ...

20 25 10 DMP-OM Okay. We're about - 15 minutes behind here, I guess.
 ... certify the first international docking ... joint
 eat period.
ACDR-OM Yep.
DMP-OM ... I feel like I'm ...

20 26 18 ACDR-OM Okay, Deke. I think that does it. (Laughing)
DMP-OM ...
ACDR-OM There's so many things - - (laughing)
SCDR-OM Sure!

20 26 32 ACDR-OM Yeah.
DMP-OM Okay. DAC ...

20 26 46 ACDR-OM ... the DAC 01 settings? ...

ACDR-OM DAC on 01 ... X, 0; Y, 270; Z, 310.

DMP-OM ..., 0, Y ...

ACDR-OM Hang on, Deke. ... Y ...

ACDR-OM ...

20 28 50 DMP-OM ...

ACDR-OM I think I'm going to just disconnect here and wait for that - -

ACDR-OM ... back here.

DMP-OM Okay. I've got this one ... the DAC, but I don't know ...

ACDR-OM Okay.

DMP-OM Where'd you stow the mag?

ACDR-OM Here you go.

DMP-OM ... it was lying here, I think.

20 31 03 SCDR-OM (Moscow ... How do you read?)

SFE-OM (...)

ACDR-OM ... table. Yeah?

SFE-OM ... picture.

20 31 43 DMP-OM Okay. Think I done pretty good.

DMP-OM Okay. Now, I wonder if I can see you here; Valeriy - -

SFE-OM How do I ...?

ACDR-OM Let's ... Vance here. Okay. I've got to check through this book.

DMP-OM I can check it for you, I think.

ACDR-OM You did?

DMP-OM Oh, boy. ...

CMP-CM ...

ACDR-OM Tell Vance to check.

DMP-OM Hey, Vance, go to select - -

CMP-CM ...

DMP-OM They're receiving him ... But I think that's right.

ACDR-OM Yeah. That's a bad ...

DMP-OM ...

ACDR-OM Yeah. Okay.

DMP-OM Okay.

20 33 18 CC-H Apollo, Houston through MILA for

ACDR-OM Okay. I've got a little bit of a squeal here. I don't know whether it's ... the speaker box is on.

DMP-OM Yeah. I - -

ACDR-OM Let me turn this one off.

20 33 48 ACDR-OM How do you read now?

CC-H Read you better now.

ACDR-OM Okay. ... the speaker box in here. I'm going to turn the speaker box off as long as we're in Soyuz.

CC-H Roger; we understand.

ACDR-OM Okay, Vance. How do you read?

CMP-CM Loud and clear.

ACDR-OM Okay. *** panel 808, UTILITY POWER - -

ACDR-OM Okay, Vance. Select ... - -

ACDR-OM Roger. How do you read, Bo?

CC-H Tom, we read you rather weakly.

CMP-CM ...

ACDR-OM Okay. You've already done it. Okay.

CMP-CM Tom, I couldn't hear you. What did you say?

ACDR-OM Okay. The step's already completed.

20 35 20 DMP-OM Okay. The next thing we're supposed to do is that docking ... thing, I believe. in the other checklist that we - -

20 36 05 CC-H Apollo, Houston. We will go LOS in less than a minute. We'll see you on ATS at 56:20.

ACDR-OM Roger.

ACDR-OM What's that in, phased elapsed time and transfer time, Bo?

CC-H I'll have to look that up, Tom. Hold on just a second.

20 36 39 CC-H Right now, our transfer time is 2:05, and we'll have ATS at about 2:10.

ACDR-OM Roger. ATS in 5 minutes. Thank you, Bo.

DMP-OM Okay.

ACDR-OM ...

DMP-OM Okay. ... thing first there.

20 37 41 ACDR-CM I guess the next thing is to sign those joint documents. Right?

SCDR-OM Joint documents?

ACDR-OM Yeah. ...

DMP-OM Yeah.

ACDR-OM (Joint documents.)

SCDR-OM ...

ACDR-OM Yeah.

DMP-OM I think Alexey should be over here, ...

ACDR-OM Yeah.

SCDR-OM ...

DMP-OM I'll hold it for you.

SCDR-OM ...

SCDR-OM Huh?

20 39 32 ACDR-OM That was JFK.

SCDR-OM Oh. ...

CMP-CM Huh.

SCDR-OM ...

ACDR-OM (...)

SFE-OM (...)

ACDR-OM (Okay.)

SFE-OM (...)

ACDR-OM (Oh, okay.)

CMP-CM Hey, you know, whoever was supposed to check all the frequencies goofed up, didn't they?

DMP-OM Yeah. They really didn't do very well, did they, Vance?

ACDR-OM ... frequency?

CMP-CM No. Whoever was supposed to check all the frequencies - - failed to do so.

ACDR-OM I know.

CMP-CM - - failed to do so.

SCDR-OM ...

DMP-OM Well, let me get up out of the way here so Alexey can get over there.

ACDR-OM Ho, Alexey?

SCDR-OM Yes?

20 41 19 ACDR-OM Wait until I turn this ... on this ... cable. That's all right. No. Let's ... to the left here, I think - right here, yeah. On this seat. ... not quite as familiar, but - -

DMP-OM It's okay. ...

DMP-OM Okay.

20 41 58 CMP-CM Loud and clear, Bo. And we've shift - switched off the VHF/FM for a while.

20 42 05 CC-H ...

ACDR-OM ...

DMP-OM So you do.

20 42 14 CMP-CM Stand by.

SFE-OM ... (Laughter)

DMP-OM Okay. Now.

SFE-OM What you think?

DMP-OM Tres boune. Here, I'll just put it anywhere I think is right.

20 43 10 CMP-CM Okay, Bo. You've got VHF back too.

DMP-OM ...

ACDR-OM They wanted us to put it on that - back.

CC-H ...

DMP-OM ...

ACDR-OM (Yes.)

CMP-CM Roger.

CMP-CM Okay. You want to just - want to turn on this - -

ACDR-OM Try it that - no, just - back. That's all right.
(...)

SCDR-OM All right.

20 43 50 DMP-OM Beats me. I don't know.

ACDR-OM Yeah.

SCDR-OM ...

ACDR-OM (Yes. Apollo.)

SCDR-OM (Apollo.)

ACDR-OM (Yes, yes, this is ... Dr. Lunney asked me to tell
it to you in Russian onboard Soyuz when we are rest-
ing there, and when you are onboard Apollo ...)

DMP-OM Okay. While they're doing that camera, I'll just -
Oh, okay. I'd better put the camera cards ...

20 44 32 SCDR-OM (George, we have an awful lot of work here, and we
haven't paid any attention to that. We just can't
find those joint documents.)

SCDR-OM Okay, Tom Stafford and Deke Slayton are sending best
wishes to you.

CMP-CM (The command module also sends its greetings.)

DMP-DM Okay. I'll turn that on, whatever - what - we have
the docking up here. Do you have the checklist? ...

20 45 32 ACDR-OM Go ahead, Bo.

ACDR-OM That's affirmative. I did.

ACDR-OM No. I'll recheck it but - -

ACDR-OM Is the speaker box on up there in the docking module?

DMP-OM Yeah, that one's on.

ACDR-OM The speaker box is on in the docking module.

DMP-OM Don't you want that one on, Bo? It's supposed to be on per the Flight Plan but we can turn it off.

DMP-OM Okay.

ACDR-OM Got it off?

DMP-DM Okay. It's off. Is that any better?

ACDR-OM How do you read now, Bo?

ACDR-OM Yeah, I can tell, we don't have a squeal now.

DMP-DM Okay.

20 46 59 DMP-DM Okay. I thought it was. I'll check it.

DMP-DM Okay. How does that look to you?

ACDR-OM (...)

20 47 28 DMP-DM I can't tell much on this monitor, Bo. So you guys check it and let me know when you like it.

20 47 35 ACDR-OM (...)

20 52 48 ACDR-OM (Laughter) Houston, Apollo.

CC-H Apollo, Houston. Go ahead.

20 52 53 ACDR-OM Yeah, Bo. Are you getting any picture in the orbit - in the Soyuz now, in the orbital module? All I can get on my monitor is just the screen. It's really brightened out.

ACDR-OM Okay. Thank you.

CC-H ... down through the hatch, and we see that quite well.

SCDR-OM Okay.

CC-H The other camera we were getting a picture on, but you're often in front of it. But that's just supposed to be a stowage location for that camera.

ACDR-OM Okay.

20 53 37 ACDR-OM Okay. We got the document set up.

CC-H Roger. You're getting ready ...

ACDR-OM We're going to sign the document soon. Roger.

20 54 01 CC-H Tom, we're looking over your left shoulder now, and we see the table quite well. So if you're getting ready to sign the certificate, that should be a good shot.

ACDR-OM Okay.

20 54 37 ACDR-OM Turn that one on, too. Turn that one on, too.

ACDR-OM Got it?

CMP-CM No, ...

ACDR-OM God damned ... Okay ...

ACDR-OM Okay, Alexey.

ACDR-OM (Laughter)

20 56 38 ACDR-OM It's right over here.

CMP-OM Sounds like you guys are working instead of partying.

20 56 55 DMP-OM Yeah. We're ready to break out the cognac, vodka, and that stuff ...

DMP-OM ... There it is. Okay. I'll go recover it. Okay.

ACDR-OM Okay. Are you ready?

DMP-OM ... There you go.

ACDR-OM I'll get a picture if you'll hold on a minute.

ACDR-OM ... picture.

SCDR-OM That's cute.

ACDR-OM Okay. ... on its way up there. ... Got it.

ACDR-OM (Laughter)

DMP-OM That was the other one.

DMP-OM What about the ... over there, Tom?

ACDR-OM Yeah. ...

ACDR-OM ... on.

DMP-OM What are you on?

ACDR-OM 01.

21 01 49 ACDR-OM Yeah, I got the light.

CMP-CM Rog. Can do, Bo.

21 03 21 CMP-CM It's all the way open, Bo. Has been.

DMP-OM Shoot the mag on the meal.

ACDR-OM Shoot the mag on the meal. We have another bag ...

DMP-OM Let's see. Okay. I have six mags for the hand held.

ACDR-OM Yeah.

DMP-OM Panorama ...

ACDR-OM Yeah. I wonder how much we have on the ...

ACDR-OM Okay, got about 34 more feet.

DMP-OM ... a bunch of pictures.

MS-OM (Laughter)

21 06 25 ACDR-OM We got to get a picture of this. Hey, Deke. Let's get a picture of this.

DMP-OM Yeah, we got to.

ACDR-OM Turn that off and ...

DMP-OM ... idea.

ACDR-OM Get over here.

21 07 39 ACDR-OM Houston, Apollo.

ACDR-OM Yeah, Bo. Do you have a camera on in the orbital module? A TV camera?

ACDR-OM Let's take a look at the one in the orbital module.

DMP-OM ... read the label.

DMP-OM In English, you spell that c-o-c-k-a.

21 08 39 ACDR-OM What is the joke?

DMP-OM (Laughter)

21 13 13 ACDR-OM Go ahead.

ACDR-OM Sure thing. Right now, I've just finished some strawberries, reconstituted. And Deke and I - Deke's eating some too. We're getting ready to eat some borscht, that you can see here.

ACDR-OM Got the tube?

ACDR-OM After that, I'm going to have turkey with cran - apple and cranberry sauce. Also, I have apple juice here, which they made a little joke, and it has a different label on the other side of it. This is (unusual juice). This is something different. It's apple juice.

DMP-OM My menu is borscht, ..., Roquefort cheese, apple and cranberry, and apple and plum sticks, and sweet apple juice. You can tell I like apples.

21 15 01 ACDR-OM And this is "Jantar" cheese, known as "syr Jantar."

21 15 19 ACDR-OM And here is Russian bread, known as "..."
SCDR-OM ...

21 15 24 ACDR-OM Little bitty, whole miniature loaves of it. (...)
SFE-OM Turkey.
ACDR-OM Turkey, which is "indeyka" (in Russian).
SFE-OM Hey, Tom.
ACDR-OM Get those ...
DMP-OM I don't know which it is ...? Oh, yeah.
ACDR-OM ...

21 17 14 DMP-OM off the ...
SCDR-OM Yes.
ACDR-OM Yeah.
SCDR-OM ...

21 18 30 ACDR-OM (...)
SFE-OM Oh. (Yes.)
SCDR-OM ...

21 19 08 DMP-OM (...)

21 19 28 ACDR-OM It should be out of film now.
SFE-OM ...
ACDR-OM I'm going to take the ... and come around to the other one.

21 19 50 ACDR-OM Houston, how much more time do we have on ATS?
CC-H ...
ACDR-OM Okay.

ACDR-OM I guess you're getting a good picture from the docking module looking down here in the tunnel, right?

CC-H ...

ACDR-OM Okay.

ACDR-OM Here's cranberry dressing.

SFE-OM (Ah.)

ACDR-OM You always have to have cranberries with turkey, right?

DMP-OM ...

CC-H ...

21 20 42 ACDR-OM Usually have that with turkey.

CC-H Roger.

ACDR-OM What?

DMP-OM We'd better find out. Be better ... pictures ... on ATS. Okay. If you ... back to ...

ACDR-OM Yeah. Very good.

DMP-OM ...

21 21 21 CMP-CM Go ahead, Bo. Okay. ...

21 21 37 ACDR-OM Oh. We got the ...

DMP-OM Tom, do you need this ...?

21 22 23 ACDR-OM Ah. (Okay.) Oh. Yeah, Deke.

DMP-OM Move up here.

DMP-OM Okay. ...

DMP-OM Got the film.

SCDR-OM Huh?

DMP-OM ...

21 23 48 ACDR-OM Oh, Deke.
DMP-OM Okay.
ACDR-OM Move over ... Scoot over, Deke.
DMP-OM ...

21 24 29 CMP-CM (...)
SFE-OM (Laughing)
DMP-OM Yeah, Vance, we ... (Laughing)
CMP-CM Can't get it out in a 5-psi atmosphere.
CMP-CM We had turkey over here tonight, too.
DMP-OM You did?
CMP-CM Big turkey night.
DMP-OM Looking ... over here, eh?

21 25 05 CMP-CM Well, just a little bit. (Laughing)

21 25 11 ACDR-OM We have room for you, Vance.
DMP-OM (...)
DMP-OM Yeah. Have to have the combination of that can opener. Oh. (Laughing) Let's see, Alexey.

21 25 52 ACDR-OM Let me float up and get a picture.
DMP-OM We got some film ... in here?
ACDR-OM Yep.
ACDR-OM You've got plenty - -

21 26 13 DMP-OM ... this damned decal.

21 27 05 ACDR-OM 1/250. Ah.

21 29 09 CMP-CM Okay. Three switches coming OFF.
21 29 15 ACDR-OM (...)
21 29 54 ACDR-OM Ah. What?
ACDR-OM All right, Bo. Sure will.
CMP-CM And we got one of our standard alarms, Bo.
DMP-OM You want to see a ...? Super.
SFE-OM Where to put this tool?
DMP-OM ...
SFE-OM What?
DMP-OM ...
21 30 41 SFE-OM ... this tool ...
DMP-OM If we have it.
21 31 48 CMP-CM Tom - -
21 32 16 ACDR-OM What's the problem? ...
DMP-OM Changing filters. ... changed it to panorama. ...
ACDR-OM Okay. I've - think I've got a ... wrench here.
DMP-OM Can you do it?
21 32 37 ACDR-OM Yeah. ...
ACDR-OM DAC 01, 10 millimeter ...
21 34 29 ACDR-OM ...
21 34 35 ACDR-OM Okay. That's ...

ACDR-OM (Laughter) You're right.

CMP-CM That ought to make a pretty good picture, Tom.

ACDR-OM Okay. That ought to do it.

21 37 43 CMP-CM ... Tom.

ACDR-OM We don't have to.

CMP-CM ...

CMP-CM Thought you guys really had vodka over there.

ACDR-OM So did we, man. It really looks like it.

DMP-OM Vodka.

21 39 11 ACDR-OM Thank you. Vodka.

21 40 48 ACDR-OM (Laughter)

21 48 32 ACDR-OM ... here.

DMP-OM ... Let's see; this is ... here.

ACDR-OM (...)

DMP-OM Hey! Where did that come from?

ACDR-OM I had a book here - -

DMP-OM We don't do anything else here inside, do we, Tom?

ACDR-OM I have my book here ... went away.

DMP-DM Well, I'll tell you what, I got to go up here anyway and get that furnace thing going. ...

ACDR-OM Okay.

DMP-DM Okay.

DMP-DM See what I can find up there. ...

21 50 05 DMP-DM We already run it through ...
DMP-DM (Laughter) Yeah. I know.
ACDR-OM ...
DMP-DM Right.
ACDR-OM ...
21 50 58 ACDR-OM (Laughter)
DMP-DM I was looking around, Tom; I don't see your book up here.
ACDR-OM Was this yours?
DMP-DM No, I didn't have one.
ACDR-OM Okay. Well, this is mine then.
DMP-DM Yeah; Okay. Yeah, that'll do beautifully. (...)
DMP-DM Yeah.
ACDR-OM Where is that ...
DMP-DM Uh, aha (laughter) ...
21 52 53 DMP-DM My God. Oh. That's beautiful. ... we could get a picture of that ...
ACDR-OM Oh yeah.
SCDR-OM ...
21 55 12 DMP-OM (... Alexey.)
DMP-DM ...
ACDR-OM Yeah.
DMP-DM ... the hole there. Oh! (Laughter) Went right down that hole. Well, maybe it'll come out again. I think there was air blowing through there.
MS (Laughter)

ACDR-OM Do you see them, Deke?

DMP-DM What?

ACDR-OM Do you see them?

21 56 27 DMP-DM No ... - -

ACDR-OM Yeah, I think I - I caught one just as it was float-
ing away ...

DMP-DM The other one went down that hole there.

21 56 43 ACDR-OM (...)

ACDR-OM Okay ...

ACDR-OM Okay, let me go up ...

DMP-DM ... yeah; while I'm up here.

CMP-CM Yeah.

DMP-DM Well, I'll go on up and get the furnace thing going.

21 57 36 ACDR-OM I'll ...

DMP-DM Okay, thank you.

ACDR-OM This connect back in over there?

DMP-DM I don't know, Tom; I'll check here. I'm not sure.

ACDR-OM All right.

DMP-DM Probably not yet.

CMP-CM Hey, I'm leaving a light on on the porch for you
guys.

MS ... yeah ...

DMP-DM Thanks. ... up there in the CM.

ACDR-OM ...

DMP-DM Uh-huh.

21 58 23 ACDR-OM Hey, Alexey. Alexey. (Laughter)

21 59 13 DMP-DM Okay. (...)

21 59 19 CC-H Command module, Houston through Goldstone. How do you read?

CMP-CM Loud and clear, Bo; ...

21 59 41 CC-H Command module - -

22 05 40 CC-H Apollo, Houston. There is 1 minute until LOS. We'll see you on ATS at 57:52.

CMP-CM Roger. Understand.

SFE-OM ...

CC-H About 3 hours and 41 minutes, transfer time.

CMP-CM Okay, and we have most of the presleep checklist done in advance.

22 05 58 ACDR-OM (...)

CMP-CM Did you want an E-memory dump tonight, Bo?

CC-H Understand you've got most of the presleep finished.

CMP-CM Rog. One item on it is the E-memory dump, and I wondered if you'd like to have that.

CC-H Vance.

CMP-CM Page 1-49, about the fourth thing down, E-memory dump.

SCDR-DV It's off.

CMP-CM VERB 74.

DMP-DM Okay.

SFE-OM Okay.

DMP-DM What about the sequence?

SCDR-DV 10.
SFE-OM 4.
22 06 35 DMP-DM (Okay, very well.) Stand by to ...
SFE-OM Vance ...
DMP-DM Okay.
SFE-OM ...
DMP-DM Huh? That's it. There.
SCDR-DV Hey, Deke.
22 07 03 DMP-DM Huh? Hey, Bo; DP.
CMP-CM He's gone.
DMP-DM They're looking for you.
CMP-CM Okay.
ACDR-OM They're taking pictures, ... off.
DMP-DM I think that answers my question, the question
involving what ... TV setup for the furnace thing.
... wouldn't have any - -
SFE-OM ...
DMP-DM - - anybody ... anyway.
22 07 29 CMP-CM We're coming up over ATS pretty quick though.
DMP-DM We are?
CMP-CM Yeah. We're over the United States right now.
22 07 48 ACDR-OM Okay.
SFE-OM ...
22 08 15 ACDR-OM (...)
SFE-OM ...

22 08 19 ACDR-OM (Very good. Yes.)

22 08 44 ACDR-OM Okay, Deke. Let me grab hold right here.

DMP-DM Huh? Oh.

SFE-OM ...

22 09 02 ACDR-OM (Which hatch?)

SFE-OM Yeah?

22 09 35 ACDR-OM (Hatch number 4.)

SFE-OM ...

DMP-DM ...

SFE-OM ...

DMP-DM Okay.

SFE-OM Yes. ...

DMP-DM ... Aw.

22 10 30 ACDR-OM (...)

22 10 54 ACDR-OM (Thank you, very nice ...)

22 11 02 DMP-DM (...)

SFE-OM ...

22 11 16 ACDR-OM Oh. (Okay, okay, okay.)

22 13 11 CC-H Apollo commander, Houston. It looks as if Moscow was trying to call - -

22 16 20 DMP-DM Yeah. (...)

22 16 31 ACDR-OM Right.

SFE-OM ...

22 17 11 ACDR-OM ... Aw, Deke. ...

22 18 01 ACDR-OM Deke.

22 18 04 ACDR-OM Ah. (Thank you.)
22 18 22 CMP-CM Go ahead.
22 18 39 CMP-CM Sure.
22 18 40 ACDR-OM Ah. (Thank you.)
ACDR-OM ... Apollo.
22 19 18 CMP-CM Okay. Houston, Apollo. Got a P52 option 3 here for
you a few minutes early, if you're watching.
22 19 37 ACDR-OM (Valeriy, come into the docking module.)
DMP-DM Okay. ...
ACDR-OM (Valeriy, ...)

TIME SKIP

23 34 01 CC-H Apollo, Houston. We're AOS through Goldstone and
we've got you for 3 minutes.
ACDR Okay.
CC-H Apollo, Houston. AOS through Goldstone for 3 minutes.
ACDR Roger. Read you loud and clear. How us?
23 36 50 CC-H We'll see you at Newfoundland in 7 minutes. And
just hold up on that pressure thing. We'll try to
talk to you a little bit more about it then.
DMP ...
23 44 04 CC-H Apollo, Houston. We're AOS Newfoundland and got you
for a total of about an hour here. And we've coordi-
nated with Moscow, and you're GO to continue in your
procedures with the delta-P integrity check that
we've had.
ACDR ...

CC-H Copy that. Press on with it then. Get it out.

ACDR ...

CC-H I guess we're - we're just going to go ahead and continue with no action right now and just keep a - keep an eye on it.

ACDR ...

CC-H That is affirmative, Tom. We want you to continue on.

23 45 17 ACDR Okay. Real good.

#

DAY 199

08 17 00 USSR ...
USSR (Are you pleased with ...?)
USSR (This is Soyuz. How is the picture?)
USSR (...)
08 18 01 USSR (This is, Kolya, not the filter, but the filter
arc.)
08 18 21 USSR (Look ...)

TIME SKIP

09 06 50 ACDR Yeah, you take ...
09 07 07 ACDR How do you read, ...?
ACDR Okay, ...
09 07 57 ACDR Pardon me?
ACDR ...
ACDR Okay, Vance, I'll disconnect ...
09 12 28 ACDR Hello, Houston, Apollo.
09 17 16 ACDR (Soyuz, Apollo. How do you read me?)
SCDR Loud and clear.
ACDR (We are in the docking module.)
SCDR Okay.
09 18 41 ACDR I guess I'll be doing the helium inject and looking
at the - I'll be the one in here ... I'll take care
of that.
ACDR All righty. It looks like we're clicking away on
schedule this morning, Bo.
ACDR Stand by.
ACDR Go ahead.

09 25 36 ACDR Roger, Bo. We're standing by on page 4-2. Go ahead.

ACDR Houston, how do you read?

ACDR Hello, Houston, Apollo. Oh, just ... Yeah. Hello, Houston, Apollo. Yeah. ...

09 27 05 ACDR Hello, So - Soyuz, Apol - Apollo. (How do you read?)

SCDR 5 by 5, Tom.

ACDR (Roger, I read you too.)

09 27 19 ACDR Hello, Houston, Apollo. How do you read?

ACDR Okay, Bo. You just dropped out completely there. We are on page 4-2 waiting for your instructions.

ACDR Okay. So in other words, we'll just be - I understand, when I inject the helium to the 150 but do the cool-down time. We just won't take it out then and deactivate it.

ACDR Okay. Real fine. Thank you.

CMP What time?

09 28 36 ACDR Oh, I'm not anywhere near it yet.

ACDR Yeah.

CMP Go ahead, Bo.

CMP You'll just have to stand by there a minute, Bo, ...

09 31 21 SCDR ... Soyuz. What steps are you doing now?

ACDR (Now we are working at ... Vance, speak further.)

CMP ... you reading me?

DMP Yeah, I'm reading you guys.

ACDR ...

ACDR ...

09 32 25 ACDR ...

CMP Yeah.

ACDR ...

09 33 05 CMP Okay. The three POWER switches on 181 were just turned on, Bo.

09 33 31 CMP (Soyuz, Apollo. Hatch number 2 is closed.)

SCDR We are finishing step number 8.

CMP (...)

ACDR (Soyuz, Apollo. We are now starting pressurization in docking module.)

USSR ...

ACDR Okay, Deke. We're pressurized.

DMP Okay. I'm going to give up on ...

09 35 45 ACDR Okay, Bo. We're pressurized in the docking module ...

CMP (Soyuz, Apollo.)

SFE Go ahead.

CMP (Please switch off our speaker box in the orbital module.)

USSR ...

USSR (Turn it off.)

CMP (Do you understand?)

09 37 04 ACDR (Soyuz, Apollo. Right now I'm in the docking module. Pressure, 490 millimeters mercury. Over.)

ACDR Roger. We're doing a pressure integrity check here, Bo.

ACDR (Good morning, I think that it is very early in Houston, isn't it?)

CMP Bo, ... We don't see you on the screen now.

DMP (... important ...)

ACDR (Right now we are working on part 9.)

CMP Are you still getting that squeal, Houston?

09 38 50 CMP Okay. We asked them to turn off the box, and I think - -

DMP Want us to turn off this one in here?

CMP - - and I think that Valeriy indicated that they've done that.

09 38 59 ACDR Bo, do you want us to turn off - Let me turn off the speaker box here in the docking module.

ACDR Okay. How do you read now? Is that better?

ACDR Say again, Bo.

ACDR Okay. We just turned off the speaker box in the docking module.

09 39 27 CMP Just for your information, the volume was all the way down on the speaker box, but it takes turning the switch off to really kill that noise.

09 39 52 CMP The fish look healthy this morning, Bo.

CMP Yeah, we have them over here on the wall. They're swimming around happily.

09 40 09 ACDR (We have a lot of fish, yes, Bo?)

ACDR (Laughter)

ACDR It sure was. I shot all kinds of pictures of those little rascals, but that was done down in the command module.

CMP That's just the way it was, but we can do that again.

09 40 56 CMP Okay. You're in that configuration now with the speaker box.

ACDR ...

09 42 12 CMP (Soyuz, ...)

ACDR (Soyuz, our step 9 is completed. Over.)

SFE Roger. Step number 8 is completed.

ACDR (We have also completed 9.)

SFE Tunnel 2 pressure equalized.

ACDR (Roger.)

CMP (Valeriy, the partial oxygen pressure of carbon dioxide is 4.)

CMP : Go ahead.

CMP Rog.

09 44 14 SCDR ... opening hatch number 4.

ACDR (Roger.)

CMP Valeriy, Vance. (Is your speaker box turned off?)

09 45 24 SFE (Yes.)

CMP Bo, he answered that he did.

09 45 38 SFE Number 4 is open.

DMP (Hatch 4, OPEN.)

CMP ... equalize.

DMP (I am equalizing the pressure between the docking module and Soyuz.)

USA (I just completed ...)

09 46 45 ACDR (Soyuz, Apollo. Please prepare Apollo TV camera. Over.)

ACDR (Turn on Apollo TV camera, please.)

CMP Deke, how do you read?

DMP I'm reading you okay, Vance.

CMP ... read me? Tom, do you read me?

09 47 30 ACDR Yeah, about 3 by. Would you select SLAVE on the CM TV camera, please?

CMP ...

ACDR Okay.

CMP ...

ACDR ...

CMP ...

ACDR ...

ACDR (... I am opening hatch 3.)

CMP Is the TV okay now, Bo?

CMP Rog. Is your TV okay now?

CMP Good.

09 53 35 ACDR-DM Okay, Bo. I'm transferring the TSB into Soyuz. We're working on step 16.

09 54 01 CMP-OM Okay, Tom. Do you read?

ACDR-DM Reading you loud and clear, Vance.

CMP-OM Okay, we're in the orbital module and up on comm here.

ACDR-DM Okay. (Step 16 carried out.)

ACDR-DM Looks like a bunch of snakes in there, Valeriy.
(Laughter)

DMP-CM ... O₂ fuel cell purge, but don't worry about it.

SCDR-OM Valeriy, but I am going to go to Apollo spacecraft.

MS (Yes, yes.) (Laughter)

SCDR-OM That is right.

CMP-OM (Yes.)

09 55 11 SCDR-OM Valeriy, ... nitrogen. Going to go.

ACDR-DM (... nitrogen.)

09 55 17 ACDR-DM (Nitrogen.)

TIME SKIP

10 35 12 ACDR-DM Roger. 70:30

CMP-OM ...

ACDR-DM Okay, Vance, I've got in 200 millimeters.

ACDR-DM ... Okay, coming up on 270.

10 36 02 ACDR-DM Close it.

10 36 10 SCDR-OM Okay. Pressure is 265.

10 36 12 ACDR-DM (Roger. I am beginning to perform step 25.)

10 37 58 ACDR-DM Okay, Deke. We're about a ... we're running 3 minutes behind. We're doing that tunnel 3 and 4 pressure integrity - hatch 3 and 4 integrity check.

10 41 32 ACDR-DM Okay, Vance. How do you read?

CMP-OM Loud and clear.

ACDR-DM Okay. At the end of 5 minutes, as far as ... here, I'm still right on 275. As far as I'm concerned, hatch 3 and 4 are GO. ... due to thermal cooling.

ACDR-DM (Soyuz, this Apollo. Your ... normal. Over.)

CMP-OM (Roger.)

SCDR-OM Roger.

DMP-CM ...

ACDR-DM Say again, Deke.

DMP-CM ...

ACDR-DM Okay. I can't - I can't hear - I can hardly hear you. Could you tweak your volume up?

DMP-CM Got the 5-millimeter lens ...

10 42 46 ACDR-DM Okay. The 5-millimeter for the DAC, Deke - ... it's eit - it's either up in F-2 or it's over in that right-hand - in that TSB that's down by the water gun.

CMP-OM Did you hear Valeriy, Tom?

ACDR-DM No.

SFE-DV Apollo, Soyuz. The results of our integrity check are also okay.

ACDR-DM (Roger.)

10 43 30 ACDR-DM Okay. Okay. I'm - seems our ... is the docking module depressurization.

DMP-CM ...

10 52 23 ACDR-DM Hello, Houston, this is Apollo. Okay. We're now on step 27.

CC-H ... we would like to have ...

ACDR-DM All right.

10 54 42 CMP-OM And, Bo. Please give us this information again about which switches to check in here in Soyuz.

10 55 05 CMP-OM Thank you.

10 56 03 CMP-OM ...

10 56 12 ACDR-DM Okay, Deke, I've finished. ... the CM-DM pressure equalization. You ready?

SFE-OM (Alexey, how do you read me? Over.)

10 56 49 ACDR-DM ... I'm equalizing pressure.

CMP-OM Okay, Alexey. (How do you read?)

ACDR-DM Okay, that spare Snoopy's back in ..., below that Earth obs - Earth observation ...

SCDR-DM (I do not hear.)

SFE-OM (How can't you hear? We hear you.)

SCDR-DM (I hear.)

SFE-OM (Yes?)

SCDR-DM (Yes.) Okay; loud and clear.

SFE-OM (Let's finish.)

CMP-OM (Yes.)

CMP-OM Houston, that fixed the problem. (Everything is normal now.)

SFE-OM (We hear you. We hear you.)

SCDR-DM Okay. Vance, how do you read me?

CMP-OM (Excellent, Alexey.)

SCDR-DM Deke, how do you read me?

DMP-CM (Excellent, Alexey.)

SCDR-DM Hey, Deke, how do you read me?

DMP-CM (Excellent, Alexey.)

SCDR-DM Okay.

10 58 01 SCDR-DM (Valeriy, we are opening hatch number 2.)

ACDR-DM Okay. I'm going to open hatch 2.

ACDR-DM Okay. You ready for Alexey to come in, Deke, for the photographs?

DMP-CM Okay. Stand by a sec here. Let's see. Got good ATS. Monitor looks okay, ...

DMP-CM Okay. ... all the cameras ready to turn on. ...

ACDR-DM Okay. ... go?

SCDR-DM Yes.

10 59 16 ACDR-DM Okay. Opening hatch 2 and Alexey should be coming in.

DMP-CM Okay.

10 59 38 DMP-CM ... turned that speaker box off.

DMP-CM Hey, Tom. ... ready ...

ACDR-DM ...

DMP-CM ... camera ... I turned them off.

ACDR-DM ...

DMP-CM ...

SCDR-DM (Ready.)

DMP-CM ..., Alexey. (Where are you?)

SCDR-CM Hello. Oh! Howdy partner. My old friend.

DMP-CM (Welcome!)

DMP-CM (To America.)

DMP-CM Here we go.

SCDR-CM Where is my place?

DMP-CM Well, for now come right into here.

SCDR-CM Okay. Back. Okay.

DMP-CM Yeah. There we go. Good show.

SCDR-CM Back.

ACDR-DM ...

SCDR-CM Okay.

DMP-CM (How do you feel?)

SCDR-CM Very well. How are you?

11 01 53 DMP-CM (All right.)

DMP-CM Okay. Now ...

SCDR-CM Back.

DMP-CM Okay.

SCDR-CM Back.

DMP-CM Do you think ... Flight Plan?

SCDR-CM Yes. Just a moment.

DMP-CM ... cameras ...

SCDR-CM Oh. This one?

DMP-CM That's your Flight Plan.

SCDR-CM Okay.

DMP-CM ...

SCDR-CM DAC 2.

DMP-CM Yeah, and here's the photo card.

DMP-CM ...

11 03 14 CMP-OM Houston, Apollo.

CC-H Go ahead, Vance.

CMP-OM Or rather, Soyuz. How's your view in here in the orbital module?

DMP-CM ...

CMP-OM Okay. Shortly we'll be coming on and give you a little explanation of what's in here.

DMP-CM Okay. Like to see ...

CMP-OM Hey, by the way, if you're looking, Bo, there's Valeriy's family. His wife, Lyudmila, and two children - daughter, son. Let's see, it's Kat - -

SFE-OM Katya.

CMP-OM Katya.

CMP-OM Dmitri. Yeah, that's it. The boy, the youngest, is Dmitri. Good-looking family, huh?

CMP-OM Katya is down on the shore of the Black Sea right now in a dacha having a - or in a camp - summer camp, he says.

11 04 43 CMP-OM Okay. And whenever you're ready, I think we're ready to go ahead and show you around the Soyuz a little bit.

ACDR-CM ... so let me check with ...

CMP-OM Okay. My friend, Valeriy, here is ready to show you and - please start, Valeriy.

11 05 10 SFE-OM Hello, American people. This is your Soviet/American TV center in space. That's ... onboard the docked Apollo/Soyuz spacecraft. I am going to tell you about Soyuz spacecraft. The Soyuz spacecraft consists of some compartments: the orbital module, the descent vehicle, instrument assembly unit, and propulsion system. The propulsion system has one main fuel chamber engine and two chamber backup engines. These engines are used for maneuvering in orbit and de-orbiting in the ***

SFE-OM There is orbital module - orbital module panel. You can see on your TV screens now.

SFE-OM The purpose of the panel is to control and monitor the orbital module systems. These are the following:

environmental control system, the TV and the illumination system, the radio system ... and the other - some systems. Next to this panel, there is the other one. We can use this panel for monitoring pressure integrity check or for Soyuz spacecraft in tunnel 2, and for air pressurizing and pressurizing of Soyuz and tunnel 2.

- 11 08 49 SFE-OM There are water systems - with the water supply and ... If one put the water supply - the water supply gun in your mouth - -
- CMP-OM Yeah. If you put it in the mouth, that's the way to take a drink, huh?
- SFE-OM You can drink.
- 11 09 47 SFE-OM There are two windows in the orbital module, the right one and the left one. One can observe the ground surfaces through these windows. We use this window for scientific experiment. There are three hatches in the orbital module. It is hatch number 4. This hatch is used for transfer from one spacecraft into the other spacecraft. This hatch was opened after docking and pressure integrity check yesterday. There is the other hatch. Here it is. We use this hatch for extravehicular activities. Welcome into Soyuz. The ... hatch is used for transfer from the descent vehicle. There are two folding desks in the orbital - -
- 11 11 36 SFE-OM This desk we used yesterday to sign the joint document to start our joint activities in space. Tom Stafford, Deke Slayton, Alexey Leonov, and me sit at this desk and have - and had our space talks. We - we are using this desk for our space lunch, too. Our space - spacecraft, Soyuz, has two living compartments. The second living compartment is the descent vehicle. ... the descent vehicle - - you - -
- 11 12 58 (Loud Whistle)
- SFE-OM ...
- CMP-OM Okay. We'll try a quick voice check, here.
- SFE-OM ...

11 15 44 ACDR-CM Bo? ...

11 15 45 CC-H Apollo, Houston. How do you read?

ACDR-CM Bo, how do you read me?

CC-H Roger. We read you. We see you're getting ready for the tour of the command module.

SCDR-CM How do you read?

ACDR-CM Okay.

USA ...

11 16 22 CC-H Apollo, Houston. We lost communications with Valeriy. Did you do anything in the command module that may have caused that?

11 16 31 ACDR-CM Could be. What do you want me to check on panel 10? I tried to hook into the center headset, but I could - couldn't get anything. So I moved over. I'm on the right-hand seat headset now.

CC-H Understand.

ACDR-CM Hey, Vance?

CMP-OM Yeah. Hey, we checked our switches here and everything's in order, so why don't you check over there?

ACDR-CM Okay. What particular one on 10? You want VOX on that?

CMP-OM That's affirm.

(Loud squeal)

11 17 18 CC-H Tom, you've got a loud squeal now.

11 17 24 SCDR-CM Hello, American people. Hello, American people. How do you read me?

ACDR-CM There, we got rid of it then.

SCDR-CM How do you read me?

CC-H Apollo, Houston. We can't read you. We suggest you use the checklist, Apollo systems, on page 1-40.

DMP-CM ... see that page. Okay. Panel 10, Tom. MODE to VOX. ... on this one.

ACDR-CM ...

DMP-CM MODE to VOX; VOX SENSE ...; VHF FM, RECEIVE.

ACDR-CM What?

DMP-CM VHF FM, RECEIVE.

ACDR-CM ...

DMP-CM VHF - -

11 18 23 CC-H Apollo, Houston. We hear you trying to call, but you are not understandable. There is a very loud squeal coming over the comm system.

11 18 33 DMP-CM POWER, AUDIO.

ACDR-CM What?

DMP-CM POWER, AUDIO; MASTER thumbwheel to 5; INTERCOM, T/R; INTERCOM thumbwheel, full decrease.

11 18 50 DMP-CM That did it. ... - -

SCDR-CM (Moscow, this Soyuz. How do you read me?)

DMP-CM - - VHF AM, OFF?

ACDR-CM Yeah.

DMP-CM AUDIO CONTROL, BACKUP?

ACDR-CM Yeah.

DMP-CM PHONE/MIC control, ON?

ACDR-CM Yeah.

DMP-CM Okay.

11 19 08 ACDR-CM How do you read now, Bo, okay?

DMP-CM ...

ACDR-CM Okay.

DMP-CM Yeah. We had a super loud squeal. You read us okay now?

DMP-CM So have we.

ACDR-CM Does this light still stay on, here?

DMP-CM Yeah. That's supposed to be ...

ACDR-CM ...

11 19 48 SCDR-CM (Moscow, Soyuz. How do you read?)

ACDR-CM Understand. You can barely read.

SCDR-CM Houston, this is Soyuz commander. How do you read me?

11 20 05 DMP-CM Okay. Ready to tour, Tom, whenever you are.

11 20 10 ACDR-CM Okay. (Alexey. I will now show you our spacecraft, the Apollo. We are very happy to meet with you here in the Apollo. This spacecraft - -)

DMP-CM Stand by. No way I can get to it.

11 20 46 ACDR-CM How's that? How's that, Bo?

DMP-CM Oh, panel 9 VOX.

11 20 56 ACDR-CM Okay. How's that now?

ACDR-CM Okay.

ACDR-CM Okay.

11 21 20 SCDR-CM (Valeriy, how do you read me?)

SFE-OM (Very well.)

SCDR-CM (Do you have comm with Moscow?)

ACDR-CM How's that, Bo?

CMP-OM Which cable are you on, Tom?

SCDR-CM (No, huh?)

ACDR-CM Say again.

DMP-CM He wants to know what portable cable - -

ACDR-CM Okay. You want to continue on, Bo?

11 21 50 CMP-OM (How - -)

ACDR-CM (The Apollo, this is - -)

CMP-OM (- - not)

ACDR-CM (The Apollo is the spacecraft aboard which the astronauts have flown to the Moon and also to our space station Skylab.)

11 22 08 SFE-OM (Wait just a minute, it's early.)

11 22 11 SFE-OM (Yes.)

SCDR-CM (Early, isn't it?)

ACDR-CM (This is the orientation indicator. This is the main indicator for our operations, and this is the backup indicator.)

11 22 30 ACDR-CM Bo, can you see ... the front?

ACDR-CM Roger. (Here is the computer. The role of the computer aboard the Apollo is a very important one. The computer makes it possible for us to tell the distance between the Soyuz or other vehicles - spacecraft in space. If I want to know our exact orbit, I can interrogate the computer. For an example: if I want to know the height of our orbit, I can ask the computer.)

CC-M (Everything is heard well.)

SFE-OM (Roger.)

ACDR-CM (Now, the - a computer is thinking after I ask it - it's thinking what to - how to respond. And now you can see our apogee of 124 miles by 121 miles. Then, here, you can see our perigee and apogee.)

SCDR-CM ... computer.

11 24 15 SCDR-CM (We will begin or not?)

SFE-OM (Okay.)

SCDR-CM (Moscow, this is Soyuz. How do you read?)

CC-M (Soyuz, Moscow - -)

SCDR-CM (I read you well. When are we having a TV session - from the Apollo?)

DMP-CM Picture looks good here, Tom.

11 24 37 ACDR-CM Okay.

11 24 39 CC-M (Then let's ...)

ACDR-CM Okay. You seeing this down there, Bo?

11 24 41 SCDR-CM (I don't see the light of the ...)

SCDR-CM (You have a picture, don't you?)

ACDR-CM Okay. Good.

USSR ...

SCDR-CM Okay.

CMP-OM (Yes.) Uh-huh.

ACDR-CM (- - sextant and telescope.)

SFE-OM (...)

SCDR-CM Okay,

SFE-OM (...)

11 25 40 SCDR-CM (Now we have the second day of our flight. We finished the second transfer. Vance Brand is with Valeriy Kubasov onboard the orbit spacecraft and I am in the Apollo with Tom Stafford and with Deke Slayton.) Tom, come here. (Tom Stafford. You know the American astronaut who's made three space flights. You know him. And now his fourth flight. Deke Slayton is sitting to the right. He is an old space veteran but this is his first flight into space. Now I am asking Tom Stafford.)

SCDR-CM Tom may start! Okay.

ACDR-CM (Soviet TV viewers. I am very happy to meet with Valeriy and Alexey here in space.)

11 26 43 SFE-OM (Repeat ...)

CMP-OM (Yes. After him.)

ACDR-CM (Here we have our onboard computer and if I ask our computer what our apogee and perigee are, the computer will think about how to respond. Now you can see 122 miles by 121 miles. A very smart computer. And this is the second important workplace for the crew.)

SCDR-CM Tom, which Apollo system is the heart of the spacecraft? (I asked, "Which - which system is the heart of the spacecraft?")

ACDR-CM (The heart of the spacecraft is the computer and the inertial gyro platform.)

SCDR-CM Okay.

ACDR-CM (And also the fuel cells. Fuel cell is the power - electrical power source.)

SFE-OM (Hour 1.)

ACDR-CM (And here we have number of switches.)

CMP-OM Oh - -

SCDR-CM Tom, please, come here.

ACDR-CM Okay.

SCDR-CM Put it here. Okay.

ACDR-CM (Here - this is the second important place for the Apollo crew. Here, we have the telescope and the sextant. We observe - we look at the stars through the telescope and determine our orientation. Also, during the approach to the Soyuz, we looked at the Soyuz through the telescope.)

SCDR-CM Tom, do all Apollo spacecraft systems have primary and backup modes? (I asked, "Do all these systems of the Apollo spacecraft have the primary and emergency backup modes?")

11 29 16 ACDR-CM (Yes. All its systems have the primary and backup modes. For example, this is the main indicator, and here's the backup indicator. We have a main and also a backup inertial plat - gyro platform. Here, we have a fuel cell plus a battery.)

SCDR-CM Tom, does it take much time to learn to operate all spacecraft systems? (I asked, "Did it take a long time to learn how to operate all these systems?")

ACDR-CM (Yes, it does take a long time, Alexey. I think about a year - a year's work - should take a year before the astronauts know all the systems.)

SCDR-CM Where do you sleep here? What is this?

ACDR-CM (Here is the place where I sleep. This is the Apollo commander's place. You know who the Apollo commander is?)

SCDR-CM I know. Tom Sta - (laughter).

11 30 34 SCDR-CM (Dear viewers, with this, we are ending our short TV coverage. I think we'll meet again in space at least once, or more. And, certainly, we'll see each other on Earth after we return - after we all return, each of us to his own homeland - in the Soviet Union and in the United States of America. Thank you, Tom. Thank you very much.)

ACDR-CM (Here we have a small kitchen aboard - -)

ACDR-CM (- - there is very little room here but, after all, nobody has to do any dishes.) (Laughter)

CMP-DV Okay, Bo. How are you reading us down in Soyuz, now?

SCDR-CM ...

CMP-DV Okay.

SCDR-CM ... report ...

ACDR-CM (Which report?)

SCDR-CM - - Beautiful.

ACDR-CM (All right.)

SCDR-CM ... very small time!

11 31 38 CMP-DV Okay. Valeriy and I are down in the descent vehicle, the part of the Soyuz that is really the control center and the part that comes down for landing. And Valeriy's on the - in the right seat - (flight) engineer's seat - about ready to give you a first few words. But first, I'd like you to make sure that we have communications with Valeriy now. We lost him a little while ago.

DMP-CM Tangled in cables.

SFE-DV How do you read me?

CMP-DV (All right, Valeriy.)

11 32 24 SFE-DV Okay! We are in the descent vehicle now. The crew control center - monitors the operation of the spacecraft main systems from the descent vehicle. There

is an instrument board. Here it is. You can see it on your TV screens now. I - I would like to illustrate the purpose of this panel to you.

DMP-CM Try to get it stowed, for now, is all.

SFE-DV So-called globe instrument. Shows automatically the - point of the Earth our spacecraft is flying over at this moment. In front of me - in front of me, there is a - -

11 33 24 SCDR-CM ...

SFE-DV - - there the other panel. It shows us how the system is operating - now. This panel has the caution and warning displays. There is one more unit - here. Here it is. We can send digital data - use this panel in automatic systems. Here are two command signal devices, the right one and the left one. We can send about 380 code - -

DMP-CM ... where we can find it.

SFE-DV - - functions to control the spacecraft. You can see the two couches now. The left one is - Soyuz commander, and the right one is mine. Vance is now in - Soyuz commander couch. We take these seats during landing and lifting off. At this time, we have a pressure garment assembly on. Now the PGAs are in the orbital module. There are two controllers. The left one - left one. Oh. (Laughter) Left one!

11 35 35 CMP-DV Pretty hard to see.

SFE-DV Uh-huh. Left one - is used to - for orientation maneuvering relative to center of gravity. The right one - is used to translate the spacecraft center of gravity - relative the orbit and change the spacecraft orbit. The descent vehicle has two windows and a special lighting device - special light - -

11 36 30 SFE-DV Generally speaking, the descent vehicle has more equipment than the orbital module. That's why you - we prefer spend our free time in the orbital module. And, Vance, would you - would you like to say - how - do you like the Soyuz spacecraft?

CMP-DV Of course, Valeriy. I wouldn't be in here right now if I didn't enjoy coming in and looking around and - Looks to us like it'd be a good air - -

ACDR-CM ... go ahead and I finish. Get that out.

CMP-DV - - a good spacecraft to be flying in. We've really enjoyed your tour here. Okay - -

DMP-CM Okay. Then I can - -

CMP-DV - - Valeriy says - Valeriy says that will be the end of his tour down here. It's a real interesting place down here; first time I've had a chance to be here in flight. And I guess we'll turn it back to you now, Bo.

SCDR-CM (We'll be finishing our daily session.)

SCDR-CM Okay.

CMP-DV Right.

SCDR-CM (What time do we finish the session? Tell us.)

DMP-CM Go ahead, Bo.

SFE-DV ... with our modules ...

11 37 59 DMP-CM Okay. Stand by, ...

SFE-DV ... (Let's start to give ...)

11 38 14 SFE-DV (Continuation of familiarization.)

SCDR-CM (Roger. Let's go right now.)

CMP-DV Yeah, Tom. ... good old ...

SCDR-CM Tom, here ...

11 39 59 SFE-OM (Do you have any estimate - -)

ACDR-CM (All right.)

SFE-OM Okay. (... We have a picture.)

11 40 18 SFE-OM (We have the American TV camera here. Good evening, comrade TV viewers. We are on the - onboard of the spacecraft. Onboard we have - Leonov is now in the Apollo, and here we have Vance Brand. In Soyuz with Brand; we are in the orbital module of the Soyuz spacecraft. We have just had two TV sessions for the American people in regard to the - about the Soyuz spacecraft vehicle and now we want to tell you about our program and also tell you somewhat about our spacecraft. Yesterday at 4 o'clock, we completed the first transfer. And here we have our TV session where there were a lot of movies made and a lot of still pictures. And also we exchanged - we will have to exchange souvenirs, and also we are scheduled to perform a number of joint experiments. As you see, the program is very tight. Here in the orbital module, we have everything that is necessary for us to work comfortably.)

SFE-OM (How is it now?)

SFE-OM (We just put the light in a different place.)

SFE-OM (Here in the orbital module, we have many different lights; the light which we use for picture taking, for television, and for movie photography. Our TV session is coming to a close, so with this, we will say goodbye to you, our dear comrade TV viewers; and the best of everything. Goodby.)

DMP-CM Okay.

11 44 12 DMP-CM Well, I'll tell you, ... there's no way to get that switch in ...

DMP-CM See the problem, right there? Anyway - -

SCDR-CM ...

SCDR-CM (Laughter)

SCDR-CM DAC.

DMP-CM ...

DMP-CM Yeah.

11 46 32 SCDR-CM I need - I need your DAC.

DMP-CM Oh. Sure do.

SCDR-CM Where is film - film for DAC?

DMP-CM Okay. Let's see. ... 119 ...

ACDR-CM ...

SCDR-CM ... up there, okay?

ACDR-CM ... get the camera ... get ...

SCDR-CM Okay.

SCDR-CM DAC 1, DAC 2 - DAC 1 (yes)?

DMP-CM DAC 2 ... No DAC 2. Okay.

SCDR-CM ...

11 47 28 DMP-CM Wait a minute. DAC 2 is - C-110.

SCDR-CM ...

DMP-CM ... LEB.

DMP-CM ... Yeah.

SCDR-CM C-110 ... Okay. Oh, pardon me. I can do it. Thank you.

DMP-CM ...

SCDR-CM Just a moment. Tom. Put it in DAC.

ACDR-CM Yeah.

SCDR-CM ... DAC 1.

SCDR-CM Okay. Thank you.

11 48 59 DMP-CM If you're ready, - -

SCDR-CM DAC.

DMP-CM - - if you're ready, I'll turn it on. Okay.

DMP-CM Okay. ...

DMP-CM Okay, whenever you guys are ...

ACDR-CM Yeah.

11 49 53 DMP-CM Well, I can You have to handhold it to get ...

ACDR-CM ...

DMP-CM I ... the wide-angle lens. I don't think ...

DMP-CM Yeah, well. We're supposed to be getting right there looking at waves ...

11 50 46 DMP-CM Let's see, you've got the DAC. Okay. If you guys are ready now, ... turn on the camera.

DMP-CM Okay. It's on. ...

11 51 09 SCDR-CM Okay. Can you make ...

DMP-CM Yeah.

DMP-CM Hey, it looks pretty from over here. ...

ACDR-CM There we go.

SCDR-CM Okay. Stop.

11 51 41 DMP-CM Good show.

ACDR-CM ...

DMP-CM ... Okay, there ...

ACDR-CM Okay. ... turned on here. Okay?

SCDR-CM Okay.

ACDR-CM Okay.

DMP-CM Alexey.

11 52 32 DMP-CM We've got the switch up there ... Right. ...

DMP-CM Okay. Go ahead. I'll just ... over that. Hell, that ...

DMP-CM Ready?

SCDR-CM Yes. We are ready.

DMP-CM ...

11 55 08 DMP-CM We're going to run out of film here ...

DMP-CM Okay. ...

DMP-CM Yeah. ...

DMP-CM Okay.

DMP-CM ...

11 59 07 DMP-CM Okay. Let's see here.

DMP-CM Okay. Coming up on ... here.

DMP-CM ... Okay. I'm - We're going to make some ... Earth obs.

11 59 36 DMP-CM ... Okay. ... Pass DAC over the old DAC here. Now the next ... DAC. ... DAC. ... Okay. Oh, I know what he wanted me to do ... get pictures ... DAC.

SCDR-CM DAC 1 ..., I'm okay?

DMP-CM Right.

SCDR-CM You want to help me?

DMP-CM Okay.

SCDR-CM ...

12 00 58 DMP-CM ... give it to you, Tom.

12 08 17 CC-H Roger.

ACDR-CM Yeah. It looks like we're right on the time line today.

CC-H Very good.

12 08 55 ACDR-CM (Soyuz this is Apollo. ...)

CC-H Apollo, Houston. We'd like to remind you not to PRO until 72:05.

DMP-CM (Very good.)

12 09 10 ACDR-CM Roger. Roger. We'll do that. What about ... pointing to the right ... be sure I'm ... how long you were ...

CMP-OM Okay. Good.

USA ...

CMP-OM ...

ACDR-CM ...

ACDR-CM ... right around here.

12 16 16 USSR It's around the - the ...

USA (What did you say?)

SCDR-CM Valeriy? Valeriy?

SFE-OM (Yes.)

SCDR-CM (Look into the window, right now. It is so interesting There is such a wonderful band of different ... around the Earth.)

12 24 49 CC-H Apollo, Houston through ATS. How do you read?

ACDR-CM Bo, read you loud and clear. We're about ready to proceed in 10 seconds on that P20.

12 25 00 CC-H Roger. Understand.

TIME SKIP

12 47 08 ACDR-CM ... the checklist calls it at 8. Do you want it up or down?

CC-H I'll check with INCO.

CC-H Tom, we'd like you to leave the VOX at 5.

ACDR-CM Okay.

CMP-OM Will the - -

12 47 34 ACDR-CM VHF FM thumb - thumbwheel is 5 ...

CMP-OM ... (We're doing that.)

ACDR-CM The S BAND's at - -

CMP-OM (We're doing this later. Right?)

ACDR-CM - - S BAND thumbwheel is not full decrease. ...

CMP-OM We've - we've ...

12 48 09 ACDR-CM How do you read, Bo?

CC-H Go ahead. We read you, but you have a background noise.

ACDR-CM Yeah, any time that I get the S BAND thumbwheel out of full decrease, it goes.

12 48 31 ACDR-CM And the POWER is at AUDIO, the MASTER is 5, like the checklist. The INTERCOM is T/R, INTERCOM thumbwheel is full decrease. VHF AM is OFF. AUDIO CONTROL panel is BACKUP. And the PHONE/MIC CONNECT is ON.

12 49 22 ACDR-CM ...

ACDR-CM Okay.

ACDR-CM Okay. Did you read Alexey?

ACDR-CM Okay. Vance, have Valeriy give Houston a call.

ACDR-CM ...

CMP-OM Okay. Valeriy - Valeriy was just speaking to you. Let's try it again.

SFE-OM Houston, Houston. This is Soyuz. How do you read me? How do you read me?

12 51 29 SCDR-CM Houston, this is Soyuz commander. How do you read me?

SFE-OM Apollo, Apollo. This is Soyuz. How do you read me?

SCDR-CM Apollo, I read you loud and clear. Soyuz -

SFE-OM (Alexey, how do you read me?)

SCDR-CM (I read you excellently. I hear you excellently, Valeriy.)

SFE-OM (Where are we flying now? Over what?)

SCDR-CM (Well, take a look at the gyro. It's easiest to tell.)

SFE-OM (I'm now in the orbital module. So go down and take a look at the globe.)

12 52 16 CMP-OM Houston, Soyuz.

SFE-OM (This is the Mediterranean.)

CMP-OM Okay. We're coming up over the Mediterranean Sea now. Just left North - North Africa, and I assume you'll be ready to carry some words from Valeriy on - looking down on the Soviet Union, shortly. Is that correct?

CMP-OM Okay.

12 52 52 SFE-OM (We've just passed over Africa, and we're now over the Mediterranean.)

CMP-OM Oh.

DMP-CM I'll get the Flight Plan here and ... Okay ... would be - Okay. About 30. You got a - yeah - yeah, okay. I better move.

ACDR-CM Hey, Alexey. ...

SFE-OM (Moscow, this is Soyuz 2. How do you read me? Over.)

DMP-CM I thought the last one was supposed to be ... You think so?

12 53 58 SFE-OM (Moscow, this is Soyuz 2. How do you read me? Over.)

ACDR-CM ...

SFE-OM (Moscow this is Soyuz 2.)

ACDR-CM ...

12 54 16 SFE-OM (I also hear you well. We're now in the orbital module, near the porthole, and - getting ready for the TV coverage. That's why you are not seeing us well.)

DMP-CM ...

SFE-OM Much better.

ACDR-CM Okay.

SFE-OM (On the TA-3 bracket.)

SFE-OM (Yes. It's not on TA-3.)

SFE-OM (We're trying to have it handheld.)

CMP-OM Okay, Bo. I think that we're about ready to go here. Looks like we're coming up over the Black Sea, and right now Valeriy is getting in position. Got a little bit of spaghetti in the cabin here; various cables and cords. He's ready to tell you a little about his homeland here, the Soviet Union, a very big country. Okay, Valeriy. Please go ahead.

SFE-OM I see my airfield where I flew 10 years ago in Graberin. (Laughter.)

12 56 16 SFE-OM Dear American TV people, you ... about the Soviet Union. Some of you visited my country and you enjoyed the beautiful people, cities, and towns, rivers, forests, mountains, and fields. Alexey Leonov and me visited the United States several times, and we did enjoy its beautiful landscapes. (Moscow. Answer.)

CMP-OM Are you reading, Bo?

CC-H ...

SFE-OM Roger. It would be wrong to ask which country's more beautiful. It would be right to say there is nothing more beautiful than our blue planet. You will enjoy the sight of it together with us, and we shall help you, explaining what flows below the spacecraft. We are going to tell you about a little part of our country, which you will see on your TV screens. Our spacecraft, Soyuz, is approaching the U.S.S.R. territory. Our country occupies one-sixth of the Earth's surface. Its population is over 250 million people. It consists of the fifteen Union Republics. The biggest of them is the Russian Federal Republic with the population of 135 million people. ...

SCDR-CM Valeriy, please. Tell our people about ...

SFE-OM (Alexey. Where are we flying now?)

SCDR-CM (Past the Volga.)

SFE-OM (Volgograd.)

SCDR-CM (Oh, we passed Volgograd.) (Just passed the Volga.)

12 58 58 SFE-OM We are approaching the Volga River now. This river is the biggest in the universe. At the moment, we are flying over the place where the Volgograd City is. It was called Stalingrad before. In winter 1942-1943, German fascist troops were defeated by the Soviet army here. 330 000 German soldiers and officers were killed and taken prisoner here. (Moscow, this is Soyuz 2.)

SFE-OM (Okay.)

SFE-OM (I won't have time to finish it in 3 minutes.)

SCDR-CM (Moscow, Moscow, this is Soyuz. How do you read?)

SCDR-CM (I read you excellently. I am now in the command module of the Apollo spacecraft. I am here together with Deke Slayton and Tom Stafford. We are flying over the Soviet Union's territory, and we are observing everything which is speeding by below us. We began our observations over the Crimean peninsula and now we're approaching the Ural Mountain range. It's a beautiful Earth below us; blue, covered with slight cloud. The ... is visible today.)

SCDR-CM (On the line.)

SCDR-CM (It looks like today's a very beautiful day on - over the entire territory of the Soviet Union. There's a lot of sunshine everywhere - Earth. Green fields - -)

SCDR-CM Okay.

13 01 39 CMP-OM Houston, Soyuz. Okay. I guess Valeriy's finished, and you got a word - a few words at the end there from Alexey, talking to his people on the ground. It's a very long tour over the Soviet Union. We're still passing over it. The eastern part here is steppe, or desert, and there's just a lot of country here - lot of farmland down here on the - on the steppes, apparently. I think very shortly we'll be at the Pacific, and here - here's some more words from Valeriy.

SFE-OM - - of April 1961. From that time, we celebrated the 12th - the 12th of April every year as a Cosmonaut Day.

SCDR-CM (Valeriy, ...)

SFE-OM Our spacecraft was launched from here, too.

SCDR-CM By the way, 3 years ago - 3 days before, Valeriy Kubasov and me was launched from this Baykonur launch pad.

13 03 22 SFE-OM We are going to land here after the end of the mission. This part of Kazakhstan was not cultivated until 15 years ago. Today, it is one of our bread-baskets. A new city, Kaliningrad, was - Kaliningrad appeared here. It was only 10 years ago. Not far from here begins the Siberia, the biggest part of our country, rich in natural resources.

CMP-OM We're over the mountain ... clouds down here.

SCDR-CM We are over mountains now.

13 04 48 CMP-OM Okay. Go ahead.

CMP-OM Okay. ... clouds. Okay. Apparently - yeah, it's a little hard to see the ground now. Valeriy's still looking at the clouds here sort of covering the view.

SFE-OM (Monitoring pressure integrity. Everything's normal.)

CMP-OM Go ahead.

SFE-OM (Did you ...)

13 05 40 CMP-OM As you see, we have a stable situation here.

13 23 21 CC-H ... minute to LOS. ATS - -

CMP-OM Next; minimum.

CC-H - - 3:38.

DMP-DM Roger.

13 23 53 CMP-OM ... Mainly the in between axis, and ... should be ...

CMP-OM And that's a repeat of the middle. ... it is ... on 6.

13 25 07 SFE-OM (... installation of ... by the American astronaut ... in the orbital module. I would like to demonstrate to you one simple experiment on rotation of a body relative to the various axes. As is known, rotation ... stable relative to the axes of inertia to the maximum moments of inertia and to the minimum moments of inertia. And as far as the central moment ... goes, the rotation ... unstable. Well, we want to show that during this experiment because it is rather difficult to perform such an experiment on Earth we ... Now I am going to show you rotation relative to moment of inertia ... it will be unstable. You will see how the rotation ... how the body will start tumbling. This was unstable rotation. Now I will show you the stable rotation relative to the maximum moment of inertia. ... astronauts. ... It's very quietly spinning without any tumbling. ...)

SFE-OM ...

13 28 09 CMP-OM Okay. We have demonstrations. Okay, this is a - just a simple gyro. And we want to demonstrate a simple but important property of a gyro. The - the - that's right. Valeriy's right. Every spacecraft has to have gyros. Stand by.

ACDR-DM ... goes too, which - -

CMP-CM You can see it. It's - this gyro is not spinning, but you can - -

ACDR-DM - - get the other bag.

CMP-OM - - hit it, and it will just tumble like any object. Now I'll spin it up.

13 29 20 CMP-OM Okay. Now we have it spinning. I'll knock on it with a pencil, and we'll see what happens.

ACDR-DM ...

CMP-OM Okay, you can see that basically it doesn't like to be moved, but that motion of - -

ACDR-DM ...

CMP-OM - - a gyro is 90 degrees from the direction of the force applied to it.

13 30 09 CMP-OM So. Very interesting. The very well-known property of a gyro is a tendency to freak out [?]. And ... Now we'll let Valeriy give it a try.

13 30 40 SFE-OM (... you understand about the gyroscope. ... power ... of the gyro ... preserves direction. Here, if this body is a gyroscope then it is not a gyroscope. It will be gyroscope when it rotates relative to its axes. So now it is quietly moving, rotating, from the smallest touch. If we set it to a twisting motion, then you will see that the touch won't do it. It will still maintain its direction in space, but if touched, it will progress in the direction of the ... moment. Now I will show you. Here, I set it to spin, and now I got the gyroscope. ... It preserves the direction of its axes in space. Now I will try to ... it. Look. It will only ... it does not change the direction of the rotation

axis. Well, such gyroscopes are in each rocket, in each spacecraft.)

SFE-OM (Okay. One moment, Vadim, the gyroscope began to move. I will demonstrate it one more time. It's moving away from me; it can be in a rightward motion.)

SFE-OM (... of the gyroscope is called ... It is used in particular in space technology for integrating accelerations.)

13 34 22 CMP-OM Okay. What's the next thing - next - that we demonstrate? We have two metal balls with a connecting stick, which - You might imagine these two balls a double ..., for example, in space. (Laughter) ... of the gyro.

ACDR-DM ... you got time for another one ...

CMP-OM Okay. The important thing is what happens - or the interesting thing is what happens when we rotate the two balls.

13 35 09 CMP-OM Okay. You can see that they rotate about a center. It's - in between the two. The - it's balls of the same mass, so therefore the eye of rotation is - -

ACDR-DM ...

CMP-OM - - directly in between the - Even when I tried to rotate about one - the balls - turns out that they still rotate about the center of the mass. Okay, let's take another example. Let's take off one of the balls and replace it by a larger.

13 36 10 CMP-OM Okay. Now we have a large, white ball, large mass and a - let's see, a small - -

ACDR-DM ... come over here.

CMP-OM - - orangish-red ball. This is analogous to the Earth and the Moon. The Earth has about 80 times the mass of the Moon. And when you have unequal masses, if the center rotation's not at the center, if it's not directly in between the - the halfway point, in the case of the Earth-Moon system, the - the whole system rotates to the point slightly under the Earth's surface about a quarter of the way down

toward the center. Now, let's rotate this and see where the center of rotation is.

13 37 02 CMP-OM As you can see, it's essentially about the white ball on - about a point just under the surface of the white ball. And this is analogous to the Earth-Moon system, as I said before.

13 37 35 CMP-OM Okay. Valeriy, would you like to give it a try?

13 37 56 SFE-OM (I would like to demonstrate to you rotation ... about the center of gravity. The body will always rotate relative to the axis which passes through the center of gravity, but in this case the center of gravity does not lie in the center of this ... but nearer to the large white ball. ... you will see how the body rotates and this we will now demonstrate. In this system, the center of gravity will pass right through the center and this ... when rotating. You see how it's rotating. See, not at all like in the other system.)

13 41 32 ACDR-CM Okay. The water's off and the lights are out.

13 51 28 ACDR-CM Okay, Vance; Tom.

CMP-OM Go ahead.

SFE-OM Go ahead.

ACDR-CM Okay. Is Alexey's food - put out separately or with special designation on it? Do you remember?

ACDR-CM Yeah, I read you.

CMP-OM Okay.

ACDR-CM Okay.

13 52 11 CMP-OM The one on the right.

ACDR-CM Okay.

13 52 26 ACDR-CM Okay.

14 06 40 ACDR-CM Roger. ...
ACDR-CM Okay.
ACDR-CM Okay, I got those two; and that's at 76:40 something.
Right?

14 07 40 ACDR-CM Will do. Be glad to.
ACDR-CM Oh, Bo, one thing. On the furnace shutdown, it's
still too hot on that sample. We don't have the
cool light yet.
ACDR-CM Okay.

14 09 00 ACDR-CM Okay. I told Alexey about the pass at Quito. We're
all squared away.

14 11 11 ACDR-CM Go ahead.
ACDR-CM Okay.

14 13 49 ACDR-CM Okay, Bo. TV POWER is ON there for you.
ACDR-CM Stand by. It's kind of hard to move around here.
ACDR-CM Okay, Bo. I guess you want the center window shade
up. Probably the worst one would be the left one.

14 16 49 ACDR-CM How's that, Bo?
ACDR-CM Okay. I got the center hatch window.

14 17 34 ACDR-CM Right now, we're preparing the meal and putting hot
and cold water with the food items.
ACDR-CM And now, we - ...
ACDR-CM Okay.

14 18 18 ACDR-CM Okay, Bo. It's going to AVERAGE right now.
ACDR-CM Yeah.

ACDR-CM Okay. I can see you're getting some bright spots in there. I can't tell where they're coming from.

SFE-OM (Moscow, Soyuz. ...)

14 19 07 SCDR-CM I read you. (...)

14 25 44 ACDR-CM Okay. Alexey says he doesn't have comm with Moscow.

SCDR-CM (Moscow, Soyuz. How do you read?)

CMP-OM ... to this.

14 26 11 ACDR-CM Stand by.

ACDR-CM How's that? .

SCDR-CM (We're ready.)

SFE-OM (Moscow, Soyuz. ... Vance Brand.)

ACDR-CM Okay.

14 27 24 SFE-OM (Moscow, Soyuz 2. We can begin to introduce our friends the first time we find ourselves with the Americans. Dear TV viewers, I am now with Vance Brand in the orbital module. I would like to ask him to say a few words.) Vance, say some words for the Russian people, please.

14 27 52 CMP-OM (Hello. Okay. Good day. I'm very happy to be here. This is my first time in orbit, and we have found very good hospitality here aboard the Soyuz. Soon, we shall eat, and I think that I very much would like to try to taste this food. It can be said that our project here are - is a very important one, and, as you know, everything is proceeding according to program. I think that everything is going very well. Of course, we are friends; we understand each other very well. And I think that soon we'll have dinner. I think we'll soon have dinner. Thank you.)

14 29 28 SFE-OM I want to ask one more question first. How do you like to fly in Soyuz spacecraft?

CMP-OM (Of course, Soyuz is a good spacecraft. It's very good here, very comfortable.)