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 I11 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   USSR New Orleans
PHOTO Photographic helicopter
REC   Recovery helicopter
SWIM  Swim team helicopter

Suffixal designations (during transfer phases only)

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

Transcription of these tapes was managed by Billie E. Johnson, Test Division, Program Operations Office, to whom inquiries regarding this document should be referred.
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 LIGHTING 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 7½ [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 ...
Okay.

I'll get it.

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

Do we need tool E yet?

I'll leave it there.

...

We need you to set up the ORDEAL, Tom.

Yeah. ... I got ...

Go ahead.

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

Okay.

You got it? You got ... here?

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

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

Okay; and we lost the telescope cover.

We're in good shape.

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

Okay. You need the tool E, Tom.

No, I don't.

Okay. I'll leave it there, then.

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

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

...

Okay.
The S-IVB's ... up to the vertical now.

So that's the story.

Yeah. It's sitting ... now.

(Laughter)

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

Okay. Well, I'll wait for it.

Better twist it around the other way.

Okay. ...

...

You know what's funny, seeing those optics coverers go.

Yeah.

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

Okay.

Ready for the docking probe.

Breakers are IN.

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

Okay.

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

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

Okay. Probe gray at full extension. Right.

Yeah.

... gray ... Now, when you're through go to RETRACT.
Okay. Next, the next is going to be a MAIN REG check, and I can get down there to help out for that.

Okay.

Then I'll do my P52.

All right.

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

... along here, right?

What?

I think ... everything on EXTEND PROBE.

Okay.

Yeah.

... anything now?

Yeah.

Okay.

Get down there, let me ...

Okay; go.

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

B, CLOSED.

EMERGENCY CABIN PRESSURE, select 1.

Test pushbutton, push.

All right, here it comes.

Okay. There you go ... Okay.

All right.
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 ...
... then BYPASS, counterclockwise.

Yeah.

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

Okay.

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

Okay, ... BYPASS ...

BYPASS, counterclockwise. Okay.


Okay, Deke, would you hold this for Tom?

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

Okay. What do you want me to hold?

...

... coming back.

...

Tom, I've got to get by you.

Yeah. All right.

... Okay.

Okay. We got the DAC stuff out, Tom.

All right. Good. Now --

Where you going?

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

It's as bad in this thing as if we ... on the ground.
What's that?

... (Laughter) Is it really?

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

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

Yeah. I got extra tapes ...

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

Here, I got one more under the couch here.

Let's see --

Here it is back here.

Okay. That looks good.

Why don't we -

Who wants some tape? I got some right here.

Yeah. Just a second. This ... just came off.

It cuts off by itself.

Just a minute, that - tape is in there.

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

Okay. In work.

Is it still daylight out?

Oh, no. We're not ...

... tape.

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

Need another one.

Yeah.

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

Yeah.

Boy, it does take a little dark adapting.

Okay. ... some lights down there.

Okay; P52.

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

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

Yes.

Okay.'

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

35. Yeah.

Okay; that was star 27, Alkaid; 43 coming next.

Damn it.

...

No. We hold up until --

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

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

Okay, are you still SCS [?]

Oh yeah. ...

Okay. ... torquing now at 20 - 35:20.

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.
I need tool E again.

All right. Stand by. Here it is.

... Right here, Vance.

Got it.

There you go.

Okay, the POTABLE LANK - TANK INLET you want verified OPEN?

Verify it is OPEN, counterclockwise.

Okay, the POTABLE LANK - TANK INLET you want verified OPEN?

Verified.

Okay on 326.

Yeah.

GLYCOL RESERVOIR BYPASS valve, OPEN.

GLYCOL RESERVOIR BYPASS, OPEN.

Counterclockwise.

Go.

GLYCOL RESERVOIR OUT valve, CLOSED, clockwise.

CLOSED.

GLYCOL RESERVOIR IN valve, CLOSED, clockwise.

CLOSED.

PRIMARY ... Anything else down here? ...

...
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.

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. ...

ACDR Okay.

DMP PRIMARY GLYCOL to RAD; valve normal, push.

ACDR All right. Normal, push. Okay, in work.

DMP And RAD TEMP PRIMARY. ...

DMP ... Okay, talkback is gray.
And - Okay.

GLYCOL EVAP TEMP IN, AUTO.

GLYCOL EVAP ... AUTO.

POTABLE H₂O HEATER, MAIN A.

MAIN A, POTABLE HEATER.

Circuit breaker - circuit breaker ... DUMP 2, CLOSED.

Yeah. ...

Yeah, yeah. Think that's what it is.

Okay. Vance, do we have that ... going to OFF? ...

All right. ... STANDBY on that one, and ...

Okay, the next thing we got, it says purge burn.

Okay. Ready.

RCS transfer to service module.

Okay, transfer to service module.

POWER NORMAL 1, OFF. Verify.

... 

Okay. Say that one again.

RHC POWER NORMAL 1, OFF. Verify. And 2, OFF.

Okay. That's one for Tom. You got the NORMALs off there, Tom?

Say again.

RHC power normal. 1 - Verify 1, OFF and 2, OFF.

NORMAL 1, OFF, and 2, OFF, verified.

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.
That's the --

... 

Yeah, panel --

I don't know.

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

B-5.

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

All right. All right.

Because we need that worse.

Okay; how about the TV?

The TV, B-5?

Yeah.

TV CM-4, TV zoom.

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

Do you have everything up to ...?

I don't know. ... here.

Okay, Tom.

Okay.

Now, one at a time.

CM-4.

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

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

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.

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.
Okay. Deke, ...

I'm going to have to ...

Might take it over there and ...

Yeah, why don't you do that.

Okay. That's back in 605.

Okay.

...

Everything.

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

The camera or the bracket?

The bracket.

The camera's in the window.

... screw this down a little bit?

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

Yeah.

Okay. I'll put the camera back.

Put the camera back.

Okay, now then, ...?

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

All we have to do is ...

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

Yeah. Down ...

... got the monitor all set up.
Okay. What lens do we want on the Hasselblad, Tom. I think it's one that's right here.

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

Okay. Actuate camera, verify camera ...

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

This zero-g business is really something.

Yeah, it is.

How are we coming on time, Tom?

We've got 20 minutes ...

Okay.

Okay, here's your camera.

Hey ...

Sure. And here's your ...

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

Ideal place for this little mother.

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

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

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

Yeah, I'll get it.

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

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

Okay.
Okay, Deke.

Okay. ...

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

All right.

I'll hand it to you in a second.

Panel 181 CM STATION POWER, OFF.

Just a second, Deke, CM TV STATION 2.

I think the POWER's OFF.

Is it STATION 2?

Yeah. CM 2 STATION --

That white connector down there.

-- one other ...

Disconnect DM ...

That's that white one.

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

There's the ...

-- that kind of a ...

It says secure the utility strap in R-5.

Secure what, Deke?

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.

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.
Okay, service module RCS monitoring check.

Go.

SERVICE MODULE RCS QUAD HELIUM, four, talkback gray.

Gray.

SERVICE MODULE RCS PROPELLANT, eight, talkback gray.

Gray.

SERVICE MODULE RCS PSM PROPELLANT, four, talkback barberpole.

I can certify that's barberpole.

And SERVICE MODULE RCS PSM HELIUM, talkback barberpole.

Okay, HELIUM's barberpole.

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

Okay, gray.

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

Okay, package temps are all --

-- 115 to 175 --

-- within the correct range.

-- PSM zero.

And PSM is zero.

HELIUM PRESSURE, 4100 to 4200.

Okay. And they all are.

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

Okay, PSM 130 to 150. On the SECONDARY --

Okay.
Wait a minute; I don't know about that.
SECONDARY FUEL PRESSURE, 178 to 192.
Oh, we don't have SECONDARY on PSM. Okay. Okay, now where are you?

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

SECONDARY FUEL PRESSURE, 178 to 192.

Okay. ... HELIUM TANK TEMP.

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

It doesn't say.

Okay. Well, it's - I think it's all right. Okay.

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

Quantity.

... Well, it's high ...

That's okay.
Okay, that's all good.

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

Yeah.

CM RCS PROPELLANT talkback, two, gray.

Two, gray.

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

Okay, that's good.

HELIEL PRESSURE is ...

That's good.
Manifold pressure on 80 to 105.
<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>20:48:59</td>
<td>CMP</td>
<td>Okay. 80 to 105 is good.</td>
</tr>
<tr>
<td></td>
<td>DMP</td>
<td>Great. Right on the nose.</td>
</tr>
<tr>
<td></td>
<td>DMP</td>
<td>Okay. EPS monitoring. ... right over here. If I can get down here.</td>
</tr>
<tr>
<td></td>
<td>DMP</td>
<td>You may want to take that one.</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>What's that?</td>
</tr>
<tr>
<td></td>
<td>DMP</td>
<td>... on my side ... I can ... secondary glycol loop check.</td>
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<tr>
<td></td>
<td>ACDR</td>
<td>Okay, well that's coming up in the next few minutes ...</td>
</tr>
<tr>
<td></td>
<td>DMP</td>
<td>... Why don't we terminate ...? Can we do that, Tom, and not screw it all up?</td>
</tr>
<tr>
<td></td>
<td>ACDR</td>
<td>All right ... a few minutes.</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>Good idea and --</td>
</tr>
<tr>
<td></td>
<td>DMP</td>
<td>...</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>I've got a feeling that we may have skipped some stuff after that, better go back and check the checkmarks.</td>
</tr>
<tr>
<td>20:49:51</td>
<td>DMP</td>
<td>Right. I got to ...</td>
</tr>
<tr>
<td></td>
<td>DMP</td>
<td>Okay, so we're at 5 minutes?</td>
</tr>
<tr>
<td></td>
<td>ACDR</td>
<td>Yeah, about 1 hour.</td>
</tr>
<tr>
<td></td>
<td>DMP</td>
<td>Pardon?</td>
</tr>
<tr>
<td></td>
<td>ACDR</td>
<td>We're at 1 hour.</td>
</tr>
<tr>
<td></td>
<td>DMP</td>
<td>1 hour ... I'm suppose to ... 8 - 9 minutes.</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>Can I help you on the sequence?</td>
</tr>
<tr>
<td></td>
<td>ACDR</td>
<td>Yeah, I tell you what, I've already done a bunch of the switch list. I've already ...</td>
</tr>
</tbody>
</table>
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 SEF. 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.
Okay. And, Deke, I'm going to get you a FUEL CELL REACS VALVES to LATCH. And ... GDC ALIGNED.

Okay.

We're standing by for 56.

Okay.

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

... monitor?

Yeah. Yeah, here it is.

Here it is.

... see if you see anything.

... out of the way.

Feel that vibration?

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

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

...

... these monitors somewhere ...

...

Going down to 350.

Yeah. ... the hatch, Vance.

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.
Okay. You got about 3 minutes 10 seconds to go. So let's ... 1/4 - we've got 4 - 16 minutes. ...

Okay. There's a black sky out there.

It is black.

I think we're over the horizon there.

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

... out there.

... S-IVB.

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

That's that ...

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

Okay.

Okay. Well, let's see ...

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

Okay. TV SERVO POWER 1 ...

Panel 400.

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

It's up --

Oh, almost -

-- behind you.

Oh, okay.

Okay. ... work on that camera.
And the silver camera - is that thing out?

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

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


Okay. HEAD WHEEL MOTOR, DRIVE, Vance.

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.

...  

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

..., Deke.

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

It's black out there right now.

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

... looking real good ...

Okay.

I think the Velcro works beautiful. ...

The lens is set up, right?

Check it.

Okay.

...  

Sure glad we had them tape that stuff, Tom.
Here we go into CM 2 and what else was there to do down here? Was that all?

I think so.

CM 2?

Yeah, that was all.

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

... that high bit rate ...

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

Okay. ...

Okay. We're at 57:30.

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

You got the PYROs, ARMed?

Okay.

Yeah.

Okay. ... PYRO A, ARMed; B, ARMed.

Okay, and tape recorder ... You got HIGH BIT RATE, RECORD -

- attitude and we're going to be doing a TD&E in 2 minutes, Dick. We're set up at 58:08 and counting.

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.

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.

Roger. Understand.
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.

All right.

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.

Yeah.

CMC in AUTO. Okay, ... maneuver.

Damn, wish that ... would stop.

Something is stopping now.

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.

Roger.

And I finally got the COAS back in, finally.

Okay, good.

Roger, Tom.

Okay. If you need the camera ever, let me know.

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

I think we hit the hand controller.

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

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

Okay, good.

It's so much better in the simulator.

Yeah.

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.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 11 50</td>
<td>ACDR</td>
<td>COAS POWER, OFF.</td>
</tr>
<tr>
<td>CM</td>
<td>EMS, OFF/STANDBY.</td>
<td></td>
</tr>
<tr>
<td>21 11 52</td>
<td>ACDR</td>
<td>EMS, OFF/STANDBY.</td>
</tr>
<tr>
<td>21 11 54</td>
<td>CMP</td>
<td>Launch vehicle SPS INDICATOR switch to GPI.</td>
</tr>
<tr>
<td>21 12 00</td>
<td>ACDR</td>
<td>All right. GPI.</td>
</tr>
<tr>
<td>CMP</td>
<td>THC and RHC, LOCKED.</td>
<td></td>
</tr>
<tr>
<td>21 12 05</td>
<td>ACDR</td>
<td>Okay. We're LOCKED.</td>
</tr>
<tr>
<td>CMP</td>
<td>You already stopped the DAC. And, I think, PCM BIT RATE, LOW. I'll get the ---</td>
<td></td>
</tr>
<tr>
<td>DMP</td>
<td>Little nervous there, eh?</td>
<td></td>
</tr>
<tr>
<td>ACDR</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>CMP</td>
<td>Yeah. Hey, Tom?</td>
<td></td>
</tr>
<tr>
<td>ACDR</td>
<td>Yeah?</td>
<td></td>
</tr>
<tr>
<td>21 12 31</td>
<td>CMP</td>
<td>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 ...</td>
</tr>
<tr>
<td>ACDR</td>
<td>All right.</td>
<td></td>
</tr>
<tr>
<td>CMP</td>
<td>Okay. ...</td>
<td></td>
</tr>
<tr>
<td>21 12 52</td>
<td>ACDR</td>
<td>Okay. You want us to go ...</td>
</tr>
<tr>
<td>21 13 01</td>
<td>CMP</td>
<td>Man, I feel that ...</td>
</tr>
<tr>
<td>ACDR</td>
<td>Oh, man. ...</td>
<td></td>
</tr>
<tr>
<td>CMP</td>
<td>Hey, Deke, I got to get down there.</td>
<td></td>
</tr>
<tr>
<td>DMP</td>
<td>Okay.</td>
<td></td>
</tr>
</tbody>
</table>
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 ...
CMF: Yeah. ... a little lower ...
ACDR: Yeah. ...

21 19 44
CMF: Okay. Hey, Tom?
ACDR: Yeah?
CMF: I've got a stable pressure down here so we're going to move right ahead and open up the hatch.
ACDR: Sounds good.
CMF: You've got the drift check ..., right?
ACDR: Right here.
DMP: Would you hand me a Flight Plan ...
DMP: You know what? ...
CMF: Yeah.

21 20 58
DMP: God damn! ...
CMF: ...
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.
Roger. Got a good hard dock - middle lined up, and all the latches are good.

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

Okay.

Okay, what have you got?

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.

Six, A, OPEN. Verified.

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

Yeah, all 12 should be OPEN.

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

Apollo, Houston. Newfoundland for 6 minutes.

Roger. Read you loud and clear.

We're on page 4-5 in the Launch Checklist. Vance is connecting the DM umbilicals.

Roger. Tom, how do you read me?

Loud and clear.

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.

Vance, where are you? Is that the ... Deke and I had ... down below us and out in front of ...

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

Okay.

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.

Okay, Tom, copy. And, Tom, that - that transmission I heard loud and clear.

Okay.

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

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

Okay. MAIN A's going CLOSED.

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.

Hey, Dick?

Yeah, go ahead, Deke.

...

Okay, Deke, copy. Thank you very much.

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.

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 ...

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, ...

CMP Camera's ...

CMP ... l4040.

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

CMP Yeah, I'll ...

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

CMP ...

ACDR Well, ...

CMP ...

CMP Yeah, ...

CMP I'll tell you, we've got these quantities.

CMP Okay. We're doing fine.

CMP (Laughter) Roger.
<table>
<thead>
<tr>
<th>Time</th>
<th>DMP</th>
<th>CMP</th>
<th>ACDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 49 48</td>
<td>I got the ...</td>
<td>That's better.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DMP</td>
<td>Well, let's see.</td>
<td></td>
</tr>
<tr>
<td>21 52 50</td>
<td>DMP</td>
<td>We don't have anything for a little while.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>I'm going to go look at stars ...</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>Boy, ... lightning. I guess it's ...</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>Okay. ...</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ACDR</td>
<td>Okay, I'll watch it, too.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ACDR</td>
<td>016 ...</td>
<td></td>
</tr>
<tr>
<td>22 00 00</td>
<td>ACDR</td>
<td>... roll is 00 - 001.6, pitch is 017.2, yaw is 359.0. ... Starting the S-IVB ... attitude.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>Yeah, we're really not in that ...</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ACDR</td>
<td>... 2 hours ...</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ACDR</td>
<td>Delta-V ...</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ACDR</td>
<td>You have a ... light on.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DMP</td>
<td>Yeah, ...</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>Okay, ... why don't I go ahead and call? Okay, VERB -</td>
<td></td>
</tr>
<tr>
<td>22 04 25</td>
<td>CMP</td>
<td>Yeah.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>Yeah, that helped.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DMP</td>
<td>We're upside down.</td>
<td></td>
</tr>
<tr>
<td>22 15 15</td>
<td>DMP</td>
<td>Okay, why don't we shine a little light up there ...</td>
<td></td>
</tr>
<tr>
<td>22 15 32</td>
<td>DMP</td>
<td>Okay, TAPE RECORDER: HIGH BIT RATE, FORWARD, COMMAND, REWIND.</td>
<td></td>
</tr>
<tr>
<td>22 15 52</td>
<td>ACDR</td>
<td>... at 12:56.</td>
<td></td>
</tr>
</tbody>
</table>
... I can see these ... light come out when the horizon.

Sunrise.

Sunrise at about 24.

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

Oh.

... help with this ...

All right.

...

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

What, at the aurora?

Yes.

I don't know what else it could be.

...

Yes.

Yeah. I'll be damned. ...

Yeah.

I've seen a ... horizon time like that. Not near that bright though.

...

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

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

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

Okay. Again the comm ...
CMF
Understand. Okay. And we -
ACDR
... see what's our roll angle.
CMP
Yes, I went up and take [sic] a look ... tunnel. That's perfectalinement.
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.
Yes. That's a noisy son of a bitch.

Yeah, is sure is. Okay. ...

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

... 

I can hold some of that for you, Vance.

...

Apollo, Houston. Newfoundland for 6 minutes.

...

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.

Okay.

Go ahead, Dick.

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

Did you get those.

Yeah. ...

Pitch, minus 78; yaw, 147.

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.

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

Okay.

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

... ATS ...

Roger, Deke.

... 

Houston, how do you read through ATS?

Loud and clear, Deke. How me?

Cleared up; no noise. It's amazing.

How about that?

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

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.

... 

Okay.

Go ahead ...
Go ahead.
Roger. ...
Roger.
Hope it wasn't too bad.
(Laughter)
That ... going to be of any difficulty.
Trying to get ... for a ...
Huh?
Did the S-band ...?
Yeah.
... we're okay.
Well, we could turn that down if we have to.
Yeah, it could be bad if - Do we have a ..., Tom?
... got it.
Deke, you got a minute?
You mind plugging that in down there ...
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 ...
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.
...
... It should go. That's ...
...
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.

###

53
I'll set up the ...

... EMP ...

... turned it off yet?

No. ...

Okay.

Hello, Houston, Apollo ...

Apollo, Houston. How do you read?

Roger. Loud and clear.

Houston, Apollo.

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

Loud and clear, Dick.

I read you with a little bit of background noise, but I can hear you okay, Tom, and I've got a preliminary N1 when you're ready to copy.

Okay. Ready to copy.

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.

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.
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.

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.

Roger. BLOCK.

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 --

You cut out, Houston.

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

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

Okay. I'll leave you alone.

... VTR POWER switch is OFF.

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.

... upside down ...

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

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

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

RATE, HIGH.

All right.

RHC and THC, ARMED.

Both.

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

Okay, Deke, SPS....

Huh?

Standing by. ... second burn.

54.2 was right. ... They hit it right on the head.

Yeah, those must be pretty big swells.

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

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

Yeah.
Yeah, look at that. That's over the land...

You aren't...

Sure go...

Houston, Apollo.

Apollo, Houston. We read you clear but weak.

Okay, everything's going good. We're set up for NCL in about a little over a minute.

Roger. Understand you're standing by for the burn, and just a reminder for BANK B.

Roger. Understand. ... is NORMAL.

EMS, NORMAL.

THC POWER, ON.

POWER, ON.

Okay. ...

... BANK B, ON.

B, ON.

Okay, ... ullage; ready -

MARK.

... ullage.

I'll give a countdown. 8, 7, 6, 5, 4, 3, 2, 1, 0.

... OFF ... Okay, ... l coming OFF ...

There's your trim.

...
CMF  ... 
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 ...
ACDR  ... 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,
ACDR  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 plus-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    ...

62
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.

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

What island - -?

What island is that? Is that the Galapagos?

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, ...

Oh, man, this stuff's ...

Okay. It's a beautiful world.

Okay. I guess you want me to strip, or something like that.

... ?

... Yeah. About to break me.

... A-6.

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

I'm going to do the ...

... 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.
LCM 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. ...
CMF  ...
ACDR  (Laughter) Oh, yeah. ...
CMF  Okay.

ACDR  Okay. While we're at it, why don't you take ...
ACDR  ...
ACDR  We're right on normal ...
ACDR  Yeah. ...
ACDR  Okay. ...
CMF  Okay.
ACDR  No, we're not. We're over the ...
ACDR  Yeah, we'll ...
CMF  ...
ACDR  ... high gain ... pitch ... yaw.

ACDR  High gain: pitch, minus 5½; yaw, ...
CMF  Pitch, minus 5½ ...
CMF  Well, I guess I'll give it a try.
ACDR  In that case, ...
CMF  ...
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.
I'll get in - I'll get your book here in a minute and help you.

To get the fish out of A-6 I got to get the hatch out.

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.

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

... 's my battery, I don't have time to ...

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

Where you at, Vance?

Right over the ...

... flashlights.

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

Houston, Apollo.

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?
We need to get some climbing cables out ...

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

We activate the --

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

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

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

Yeah.

Can we eventually transfer those looking ahead?

Did you get that, Deke?

Okay.

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

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

... Eventually. Not now, Tom.

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

Okay. Now.

... Roger. Understand.

... 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.
Okay. Thank you.

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

We'll never get all that stuff ... around ... - We'll never get this ... fixed up.

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.

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

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

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)

Gene, thank you.

And, Deke, you know where the Experiment Checklist could that be looked for?

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

Okay.

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.

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

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

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

Yeah.
Oh, wonder ...

Yeah.

Okay.

Apollo, Houston. Short pass at Orroral Valley for about 3 minutes. How do you read?

Loud and clear, Crip [sic].

Roger, Vance. How y'all doing?

I estimate we're about 20 minutes behind the time line. Deke is getting ready to go into the DM.

Okay. Super.

We've just opened hatch 2.

Okay. Thank you.

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

Let's look in the Flight Plan. ...

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

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

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.

Okay. Very good, Dick.

Did any - did anybody give the old crew status report?

Yes. Deke did it.

Yeah, ...

... just barely looked at it.
You got to leave it off all the time ... there's a little container in A-5.

A-5. ... in my pocket.

Okay, Deke. Need any help?

Yeah.

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

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

And if you want, I'll read your checklist to you.

... 

It's up to you.

...

Okay. And, Tom?

Yeah.

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

This morning?

Yeah.

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

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

It'd be right after wake up.

Yeah.

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.
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?

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

... 

Do you smell something funny in here?

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

Glue?

Yeah.

Vance, here's your flashlight back.

Thanks.

All right. Say what it is, Deke.

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

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

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.

Hey, Vance?

Yeah, Tom.

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

No.

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.
Okay?

I've got it.

And let's see, which end do you get?

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

Here's P1 and P2.

Okay.

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

Red dot - This is a yellow dot here.

Well, here's a yellow dot.

Yeah; one end goes to 800 --

... 

Better make sure.

Here's the ... end.

The DM.

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

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

Okay. Is it supposed to be done yet?

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

Okay.

Take one on each one.

Whatever the procedure says.

...
Okay.

Get it?

Yeah.

Good. Halfway.

That's right.

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 ... The cable ...

Good.

... time to get the ZFF ...

Okay.

There's another cable there.

Okay.

Another snap.

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

Okay. I've got this ZFF ...

Okay.

And do you want to get the tape[?] too?

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.

Well, I'll let you go ahead.

Deke ...

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 -
Yeah.

Circuit breaker UV/DOPPLER MAIN A, CLOSE.

Stand by.

UV/DOPPLER MAIN A, CLOSED.

Okay. That's panel 230?

Yeah.

UV COVER, CLOSE - verify.

Okay. It's barber pole. It sure looks that way. Yeah, verify.

Okay. UV ABSORPTION POWER, ON.

POWER, ON.

ABSORPTION LAMPS, ON.

LAMPS, ON.

27:51:25 ... on the Flight Plan. ... log ...

What was that again, Tom?

27:51:25.

51:25. Okay.

... the Rendezvous Book? Okay.

Hey, while you're down there, Vance, how about us making sure we got everything on the checklist before he checks it off.

I checked it off. You can check everything at the first ... We're configuring it.

Okay. Good enough.

Okay. ... right down through here.

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?


DMP 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.
That way.

Get that?

Yeah.

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

Okay. This damn snap isn't ...

Put her on the Velcro.

... right here. Okay.

Okay. Record the DM systems gages as follows: \( N_2 \) 1 and 2 tank quantity.

Okay.

1 and 2 in order.

\( N_2 - 1 \) is 82. Number 2 is 82. \( O_2 \) --

Okay.

--- is 84 and 82.

Our cabin press?

Press is 230 about.

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

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

Should be 17, probably.

17. Oh, that's Centigrade. Yeah, it's 17. Okay.

(Laughter)

Okay. And \( PPO_2 \) A and B.

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

Okay \( PPCO_2 \).
DMF  About 0.0 - 0.7, rather.
CMP  0.7, huh?
DMF  0.7.
CMP  Okay. Next is DAC setup. Note: Stow miscellaneous straps, lens covers, bags, et cetera in TSB on DM wall.
DMF  Yeah, right.
CMP  Okay. Obtain from D-3 and assemble the following: DAC 02.
DMF  Okay. D-3
CMP  D-3.
DMF  Right here.
CMP  Uh huh.

16 20 18  
DMF  DAC number 02.
CMP  And - you got a filter on the DAC, right?
DMF  Yeah.
DMF  I ... I can't believe that ...
CMP  Okay. DAC 02. That's right. Mag CI02 on -
DMF  ...

16 20 18

CMP  Okay. 5-millimeter lens; should be on it.
DMF  On it.
CMP  U-mount.
DMF  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 ... --
DMF  No, nope. They don't. That's that --
That's the special one. Okay.

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

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

No, they don't either.

Yes, they do.

Nope. This is the U-mount.

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

Read you loud and clear, Dick.

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

Okay; one thing that's a problem here is the fact --

TIME SKIP

Okay, is the WASTE STOWAGE VENT valve CLOSED?

Probably not.

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

WASTE - WASTE STOWAGE VENT? Oh, yeah, that's been CLOSED. ...

Okay.

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

Okay.

Okay.

Okay, I've got everything that you have outlined there.
CMF: We missed the cal. Okay.

ACDR: Oh, yeah.

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

CMF: It tells in this procedure, I think. I think it's 41. Check under the furnace — —

ACDR: The furnace ops.

CMF: -- ops.

ACDR: Yeah. The furnace ops. ...

CMF: Okay, on panel 181, CM 1 STATION POWER, OFF.

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

CMF: Okay. TV AMPLIFIER, BYPASS.

ACDR: ...

CMF: No, it's the one over on the right.

ACDR: ...

CMF: TV AMPLIFIER, BYPASS.

ACDR: BYPASS. Okay.

CMF: 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.

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

ACDR: It's 12:30, Houston time.
Okay, Vance, what's the next ...?

Okay.

...

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

...

Hey, Deke?

Yeah?

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

Okay.

...

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

...

Hey, Deke?

Yeah?

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 - - ?

No, it goes on the DAC bracket.

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

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

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

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

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. ...

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

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

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

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

Son of a bitch! Everything's coming out of the ... Oh, fuck!
DMF When do we get contact with ... again?

CMP Oh, stand by.

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

DMF 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.

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

CMP What's that?

DMF ... 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.
Okay. Under what section is it?

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

Yeah.

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."

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

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

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

... One I didn't know about.

Yeah.

What page is it?

1-6 of the Docking Checklist.

Vibration test is completed.

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. ...

Deke?

Yeah?

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

Yeah, right.

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

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

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

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

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.

Okay.

How about ATS, Tom? Are we coming up on ... very soon?

... Flight Plan ...

... Yuk!

... 

Okay, you got ... six-pack ...?

Right.

... 

... Okay, one other one.

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

Maybe three - D-3.

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

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

That's ...
Okay, do you have a bag up here?

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.

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

What's that? Up there?

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

...  

Yeah.

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

Yeah.

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

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

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

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

Oh, okay.

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

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

I think you have this Hasselblad for this yaw maneuver.

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.
... 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
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.

... 

... 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.

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

(Whistling)

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

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

Apollo, Houston through Madrid.

Loud and clear.

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

Roger.

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.

... your angles.

Apollo, Houston. Say again.

Roger. What do you have for your angles there?

We're rechecking them right now. Hang on just a second, please.

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
          ACDR   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

103
07 05 07 MCC-M

(Roger. Repeat the last ones, please.)

07 06 26 USSR

(6 ... 070 Tl, 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

104
Yeah, it looks like we might. I can hear a hissing.

Houston, Apollo.

Houston, Apollo on ATS.

Pretty good, Crip. I've got a little something to report to you here.

Well, at 43:20, approximately, we got a ...

TIME SKIP

Loud and clear. Go ahead.

No. I can't get it.

You can't reach back there? Do you want to ... around to the mike? ... 

...

...

...

...

... I haven't seen them either. ...

47:22 ... Loud and clear.

We're maneuvering into that attitude now with a VERB 49. We don't have too far to go.

Houston, Apollo. How do you read?

...

Go ahead, we read you loud and clear.

Hello, Houston; Apollo. How do you read?
Houston, Apollo. We read you loud and clear. How us?

Roger, Houston. We read you loud and clear. How us?

Houston, Apollo. How do you read?

... 

Hello, Houston. This is Apollo. We've been reading you loud and clear. Over.

Hello, Houston; Apollo. How do you read?

Okay, are you guys ...

Do you have to take that off before you can ...?

That's right.

You do, huh?

Mainly because of the interference with the ...

Houston, Apollo. ... ATS.

...

I don't know.

..., Houston. How do you read?

There they are.

Loud and clear.

Okay. ... put that in?

Yeah.

Okay. I can stick it in, if you want. Doesn't matter.

Deke, why don't you ... ahead while Vance goes ... pretty fast starting from now on.
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.

Okay.

... TV picture ...

All right. Stand by.

...

...

That's what I need to do.

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

...

Oh, I see ...

...

Okay.

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

Okay. ...

Tell you what, I'll ...

Yeah. How's that look?

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

Okay, Tom. ...

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

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

Deke, why don't you use Myrtle while you're down there, and then I'll follow.
ACDR  I got it covered.

11 50 55 ACDR Okay, Houston; Apollo. We've got hatch 1 closed, locked, and the PRESSURE EQUALIZATION VALVE, CLOSED.

ACDR  I don't know, it could be.

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, EMAG 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 EMAG 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.
Man, look at all the stars.

Yeah. Little one ... Orion ...

We have a lot of sparklers outside the spacecraft from an effluent dump. We ... Looks like a snowstorm out there. ...

... 

Isn't that amazing?

Tom, you urine's really turned into a snowstorm out there.

Okay.

Okay. We'll get to it.

... supposed to shortly do?

Wastewater dump.

That's right. ...

... see the water down there. ... island.

... big one over there.

Yeah, I'll bet you it's ... See the lights down there? ...

Ah - ... VENT, Tom, I think ... OFF.

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.

Okay.

Okay. Here's the ... NOUN 84 is 33.5.

Verify delta-V is 7.

... 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 ...
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.
Okay. Let's ... VERB 49, all ...

Yeah. All of them.

... CMC, AUTO.

...?

Okay. Either way.

Okay. And I'm ... off on the first ...

... No, ...

Oh, Tom?

Yeah.

You put any water through Myrtle?

Oh, no I didn't.

We ought to.

Here they are.

Oh ho! Okay.

...

Okay; let's see ... 36. Really good, huh?

Okay.

Okay. And we're ready for you to go MIN IMPULSE, ..., and I'll stand by for the burn.

Okay. ... CMC in FREE ...

Stand by. Stand by.

MARK. Right on.

... 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 mane­neuer 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?
They look good. Very good. Okay. You got ... 65 ...

ACDR Yeah.

Okay. I'm getting the Velcro.

... God damn. We're looking for this stuff.

(Haught)

6 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 ...
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.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 36 16</td>
<td>CMP</td>
<td>Marking is really ... Dick. The computer ... really know where we are.</td>
</tr>
<tr>
<td>14 36 53</td>
<td>CMP</td>
<td>Well, I think we're over Africa.</td>
</tr>
<tr>
<td>14 43 23</td>
<td>DMP</td>
<td>Look at that ...</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>...</td>
</tr>
<tr>
<td></td>
<td>DMP</td>
<td>Yeah.</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>...</td>
</tr>
<tr>
<td>14 44 30</td>
<td>ACDR</td>
<td>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 ...</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>...</td>
</tr>
<tr>
<td>14 45 11</td>
<td>ACDR</td>
<td>...</td>
</tr>
<tr>
<td>14 45 26</td>
<td>SCDR</td>
<td>Apollo, Soyuz. ...</td>
</tr>
</tbody>
</table>

TIME SKIP

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<thead>
<tr>
<th>Time</th>
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<th>Message</th>
</tr>
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<tbody>
<tr>
<td>15 09 25</td>
<td>CMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>ACDR</td>
<td>... don't ... for me ...</td>
<td></td>
</tr>
<tr>
<td>DMP</td>
<td>Yeah.</td>
<td></td>
</tr>
<tr>
<td>15 15 04</td>
<td>CMP</td>
<td>Okay. TV switch list 1-19.</td>
</tr>
<tr>
<td>ACDR</td>
<td>... same ...</td>
<td></td>
</tr>
<tr>
<td>15 15 10</td>
<td>CMP</td>
<td>Okay.</td>
</tr>
</tbody>
</table>
15 18 28  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.
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.
Okay ...

... 

Yep. Okay. You want me to ... up? You might as well ...

... 

Okay. Yeah, I can't get ... this attitude right now ...

Houston, how do you read?

Loud and clear. How do you read?

Crip, you should have a good TV picture.

Okay. TV has to be --

And we have the guide ring extended.

Okay. Yeah, what we need is minus 2225 ... Maybe the thing to do is take the camera off for a second.

Okay.

Stand by.

Okay. ... infinity.

And, Dick, we have two lights, SM RCS B and D.

(Soyuz, please tell us when you begin your maneuver.)

(Soyuz, this is Apollo. How do you read?)

I read you 5 by 5.

(Yes, please tell us when you begin your maneuvering.)

We're initiating rotation maneuver. You see?

(Yes, very slowly.)

120
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.
... latest calling code.

Yeah.

TIME SKIP

Houston, Apollo. We've completed step 20, and they're working on step 21.

Roger.

Okay. ...

Yeah.

You talking to me?

You want to get your --

I didn't hear your message there, Bo.

Okay. You're talking about that camera. Oh.

Yeah.

Okay.

You didn't like the picture we had on the other one, huh? (Laughter) We can't fix that.

Okay. And 37. He's at 40 right now.

(Soyuz, this is Apollo. Now hatch 4 is open? Over. Roger. Roger.)

Oh, okay.

Hey, that's beautiful. ...

Okay. ... (....) ...

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.
Yeah. Oh, boy, we might have missed a step here in --

We sure did.

-- the comm configuration, Tom.

Okay. You got it. How's that?

... we jumped ahead.

Okay. Let me put it to VOX.

Oh - somewhere.

Back, back, back, back.

It's right around -"Prepare Apollo TV."

I think on the time ... 41 minutes. I don't think we're to it yet.

Okay.

Let's see, the time is --

Yeah, it was here. Yeah. Right.

Okay.

Okay.

About 52, I guess.

Okay, here we go. Now ask him to do it.

Okay. But we got the valve open?

We got the valve open.

Okay.

-- panel 6, MODE to VOX.

Okay, VOX --
VOX sensitivity as required - approximately 7.

Okay.

On panel 98 - thumbwheel VOLUME down to eliminate squeal.

Okay. You got it.

Great. Okay, that did it.

(Soyuz, our step 23 is completed. We are now working on step 24.)

Yeah. We're through with that, too, Tom.

Right here - 25. Ready to open - Here, let me get the light on.

... camera. Just a sec. Yeah. We're right on schedule. Okay, there.

Okay. Go to unlock.

The camera is running.

Okay. Right on schedule.

Perform hatch opening.

No. ...

(Soyuz, how do you read?)

Are you hearing us?

(I am ready to open hatch 3.)

You reading us, Bo?

Okay. Well, we're not reading them much either.

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.

DMF-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-CM 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 --
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  ...

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.

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.

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 ...


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 Govern-ment. 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)
Yeah.

... me to help you?

In AVERAGE not PEAK. Okay, in work. Is this over there?

I don't know. I can try it. ...

There it is.

You get two choices there, Bo. Which one do you like?

Lots better on the monitor.

That's better.

...

Is that better, Bo?

Okay.

What was it in?

Well, ... what I just put it in.

(Laughter) Look at that in the monitor.

Here you go. ... This goes in here. ... okay we got that done.

Okay ...

...

Right.

Hey, Tom? We got out U.N. flag?

Stow flags in TSB.

Okay.

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.
Yeah, we got a call, but it was just a - kind of an ... up to the - both crews.

Kind of a speech thing?

Right. It was a speech by Secretary Breshnev ... both crews.

Um hum.

But I had the feeling Alexey ... to hear it.

I see.

Hey, Vance, I heard - I ain't heard nothing ...

Right. I - I didn't think I did either so I was a little --

... 

Okay. And I'm suppose to put TV camera back in A-7. This right? Camera in ... 

... verify.

Okay, Vance. I guess we got another comm configuration here.

Okay. I'm standing by.

Okay. MODE INTERCOM, PUSH TO TALK, and VHF AM ...

Okay, PUSH TO ... and VHF AM ... FM ... FM ...

Want the AM OFF.

And AM is OFF.

Roger. ... NORMAL and POWER, OFF.

NORMAL.

And POWER, OFF.
... POWER, OFF ... Oh, POWER, OFF. Okay? Right.

(Soyuz, Apollo.)

Go ahead.

(You all ready; your cabin?)

..., Vance?

How do you read me?

Loud and clear, Alexey. (Are you ready?)

Yes.

...

...

Okay, how do you read, Dick - Deke?

Okay, I got you now.

Got you loud and clear, Vance. How us, okay?

Yeah, loud and clear.

Okay, I'll go ahead and ... Soyuz power DM breaker ... power ... there.

Okay, AUDIO 1, POWER, OFF. ...

Okay, Deke, how do you read now without ...?

Okay, Deke, ... hooked up?

Okay. ...

All right.

... VOX.

(Laughter) ... Tampico ...
ACDR-OM 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-OM 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.
Okay. SLAVE now.

Okay. I unstore ... Now, let's see ... 

Okay; POWER, ON. Now - (Laughter)

Yeah. I got this whole bundle of ... adapters, whenever you want ... 

Okay. I got a feeling - have you got a thing on your checklist where I install this TA-3 with the ...?

Ah; let's see -

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 ...

... required. No, it sure doesn't. Ah - no, wait a minute - Reroute cable -

That's all it says.

... cable ...

What happened, we had an interference with ...

Ah ... Can you move that ... a little bit? ...

(The first maneuver has been performed. Orientation established.)

Roger. Apollo maneuver is completed.

Apollo-Soyuz maneuver is - are completed.

(Exactly.)

Tom, you're about to get your second biggest thrill of the day.

What's that?

Well ... I got to get over ...

(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 ...
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 ...

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.

SCDR-OM (Moscow ... How do you read?)
SFE-OM (...)
ACDR-OM ... table. Yeah?
SFE-OM ... picture.

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 ... -- 

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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.

CMF-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 CMF-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 resting 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.

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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.

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 3/4 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."
And here is Russian bread, known as "..."

Little bitty, whole miniature loaves of it. (....)

Turkey.

Turkey, which is "indeyka" (in Russian).

Hey, Tom.

Get those ...

I don't know which it is ...? Oh, yeah.

...

... ... off the ...

Yes.

Yeah.

...

(...)

Oh. (Yes.)

...

(...)

It should be out of film now.

...

I'm going to take the ... and come around to the other one.

Houston, how much more time do we have on ATS?

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 ...

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 ...

ACDR-OM Go ahead, Bo. Okay. ...

ACDR-OM Oh. We got the ...

DMP-OM Tom, do you need this ...?

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.
Okay. Three switches coming off.

ACDR-OM (...)

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 ...

SFE-OM ... this tool ...

DMP-OM ... ... If we have it.

CMP-CM Tom --

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?

ACDR-OM Yeah. ...

ACDR-OM DAC 01, 10 millimeter ...

ACDR-OM ...

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.

21 39 11

CMP-CM Thought you guys really had vodka over there.
ACDR-OM So did we, man. It really looks like it.

21 40 48

DMP-OM Vodka.

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 float­ing 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.
Hey, Alexey. Alexey. (Laughter)

Okay. (...)

Command module, Houston through Goldstone. How do you read?

Loud and clear, Bo; ...

Command module —-

Apollo, Houston. There is 1 minute until LOS. We'll see you on ATS at 57:52.

Roger. Understand.

...

About 3 hours and 41 minutes, transfer time.

Okay, and we have most of the presleep checklist done in advance.

(...)

Did you want an E-memory dump tonight, Bo?

Understand you've got most of the presleep finished.

Rog. One item on it is the E-memory dump, and I wondered if you'd like to have that.

Vance.

Page 1-49, about the fourth thing down, E-memory dump.

It's off.

VERB 74.

Okay.

Okay.

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.

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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 coordinated 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 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.
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. ...

ACDR

Hello, So - Soyuz, Apol - Apollo. (How do you read?)

SCDR

5 by 5, Tom.

ACDR

(Roger, I read you too.)

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?

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, ...

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?)
Bo, ... We don't see you on the screen now.

(... important ...)

(Right now we are working on part 9.)

Are you still getting that squeal, Houston?

Okay. We asked them to turn off the box, and I think --

Want us to turn off this one in here?

-- and I think that Valeriy indicated that they've done that.

Bo, do you want us to turn off - Let me turn off the speaker box here in the docking module.

Okay. How do you read now? Is that better?

Say again, Bo.

Okay. We just turned off the speaker box in the docking module.

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.

The fish look healthy this morning, Bo.

Yeah, we have them over here on the wall. They're swimming around happily.

(We have a lot of fish, yes, Bo?)

(Laughter)

It sure was. I shot all kinds of pictures of those little rascals, but that was done down in the command module.

That's just the way it was, but we can do that again.

Okay. You're in that configuration now with the speaker box.
(Soyuz, ...) 

(Soyuz, our step 9 is completed. Over.)

Roger. Step number 8 is completed.

(We have also completed 9.)

Tunnel 2 pressure equalized.

(Roger.)

(Valeriy, the partial oxygen pressure of carbon dioxide is 4.)

Go ahead.

Rog.

... opening hatch number 4.

(Roger.)

Valeriy, Vance. (Is your speaker box turned off?)

(Yes.)

Bo, he answered that he did.

Number 4 is open.

(Hatch 4, OPEN.)

... equalize.

(I am equalizing the pressure between the docking module and Soyuz.)

(I just completed ...)

(Soyuz, Apollo. Please prepare Apollo TV camera. Over.)
ACDR  (Turn on Apollo TV camera, please.)

CMP   Deke, how do you read?

DMF   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-OM ... 0₂ 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 ... 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.
Okay, Deke, I've finished ... the CM-DM pressure equalization. You ready?

Alexey, how do you read me? Over.

10 57 49 ACDR-DM ... I'm equalizing pressure.

Okay, Alexey. (How do you read?)

Okay, ... that spare Snoopy's back in ..., below that Earth observational ...

(I do not hear.)

(How can't you hear? We hear you.)

(I hear.)

(Yes?)

(Yes.) Okay; loud and clear.

(Let's finish.)

(Yes.)

Houston, that fixed the problem. (Everything is normal now.)

(We hear you. We hear you.)

Okay. Vance, how do you read me?

(Excellent, Alexey.)

Deke, how do you read me?

(Excellent, Alexey.)

Hey, Deke, how do you read me?

(Excellent, Alexey.)

Okay.

(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.

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?)


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.

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?

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?


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?
Okay. Shortly we'll be coming on and give you a little explanation of what's in here.

Okay. Like to see ...

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 - -

Katya.

Katya.

Dmitri. Yeah, that's it. The boy, the youngest, is Dmitri. Good-looking family, huh?

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.

Okay. And whenever you're ready, I think we're ready to go ahead and show you around the Soyuz a little bit.

... so let me check with ...

Okay. My friend, Valeriy, here is ready to show you and - please start, Valeriy.

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 ***

There is orbital module - orbital module panel. You can see on your TV screens now.

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 couldn't get anything. So I moved over. I'm on the right-hand seat headset now.

CC-H Understand.

ACDR-CM Hey, Vance?

CMF-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?

CMF-OM That's affirm.

(Loud squeal)

11 17 18 CC-H Tom, you've got a loud squeal now.

11 17 21 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?
Which cable are you on, Tom?

(No, huh?)

Say again.

He wants to know what portable cable --

Okay. You want to continue on, Bo?

(How - -)

(The Apollo, this is --)

(- - not)

(The Apollo is the spacecraft aboard which the astronauts have flown to the Moon and also to our space station Skylab.)

(Wait just a minute, it's early.)

(Yes.)

(Early, isn't it?)

(This is the orientation indicator. This is the main indicator for our operations, and this is the backup indicator.)

Bo, can you see ... the front?

(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.)

(Everything is heard well.)

(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.)
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.)

Tom may start! Okay.

(Soviet TV viewers. I am very happy to meet with Valeriy and Alexey here in space.)

(Repeat ...)

(Yes. After him.)

(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 it the second important workplace for the crew.)

Tom, which Apollo system is the heart of the spacecraft? (I asked, "Which - which system is the heart of the spacecraft?")

(The heart of the spacecraft is the computer and the inertial gyro platform.)

Okay.

(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 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 space-craft 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 --

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!

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 --

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?
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 - -

... go ahead and I finish. Get that out.

-- a good spacecraft to be flying in. We've really enjoyed your tour here. Okay --

Okay. Then I can --

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.

(We'll be finishing our daily session.)

Okay.

Right.

(What time do we finish the session? Tell us.)

Go ahead, Bo.

... with our modules ...

Okay. Stand by, ... 

... (Let's start to give ...)

(Continuation of familiarization.)

(Roger. Let's go right now.)

Yeah, Tom. ... good old ...

Tom, here ...

(Do you have any estimate - - )

(All right.)

Okay. (... We have a picture.)
(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.)

(How is it now?)

(We just put the light in a different place.)

(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.)

Okay.

Well, I'll tell you, ... there's no way to get that switch in ...

See the problem, right there? Anyway --

... 

(Laughter)

DAC.

...

Yeah.

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.

SCDR-CM  Okay. Stop.

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.)
I thought the last one was supposed to be ... You think so?

(Moscow, this is Soyuz 2. How do you read me? Over.)

... (Moscow this is Soyuz 2.)

... (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.)

... Much better.

Okay.

(On the TA-3 bracket.)

(Yes. It's not on TA-3.)

(We're trying to have it handheld.)

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.

I see my airfield where I flew 10 years ago in Graberin. (Laughter.)

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.

Are you reading, Bo?

...
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. ...

Valeriy, please. Tell our people about ...

(Alexey. Where are we flying now?)

(Past the Volga.)

(Volgograd.)

(Oh, we passed Volgograd.) (Just passed the Volga.)

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.)

(Okay.)

(I won't have time to finish it in 3 minutes.)

(Moscow, Moscow, this is Soyuz. How do you read?)

(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 Cos-
monaut 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.
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.

(Monitoring pressure integrity. Everything's normal.)

Go ahead.

(Did you ...)

As you see, we have a stable situation here.

... minute to LOS. ATS --

Next; minimum.

-- 3:38.

Roger.

Mainly the in between axis, and ... should be ...

And that's a repeat of the middle. ... it is ... on 6.

(... 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. ...)

...
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 that's right. Valeriy's right. Every spacecraft has to have gyros. Stand by.

Okay, this is a - just a simple gyro. And we want to demonstrate a simple but important property of a gyro. The - that's right. Valeriy's right. Every spacecraft has to have gyros. Stand by.

... goes too, which - -

You can see it. It's - this gyro is not spinning, but you can - -

-- get the other bag.

-- hit it, and it will just tumble like any object. Now I'll spin it up.

Okay. Now we have it spinning. I'll knock on it with a pencil, and we'll see what happens.

Okay, you can see that basically it doesn't like to be moved, but that motion of - -

... a gyro is 90 degrees from the direction of the force applied to it.

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.

(... 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. Valeri, 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-CM 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.)
Thank you very much. (Now, we will continue our TV coverage. Our joint activities with Vance Brand, who is visiting here, will soon come to an end, for this joint activity began at 4 hours at Sun - very little is left. The only procedure that we have left to do is our joint dinner. We have conducted all of our joint experiments, all our joint tasks. We have held several TV coverage sessions about the flight, and now the concluding stage of our joint stay here is approaching. To Vance, for you to remember your stay here, I would like to present to you from the Soviet - the Russian people - a medal of the Soyuz and Apollo. Now, you would - you can be able to see it on your screens. The same kind of medal was presented yesterday to Stafford and Deke Slayton - yesterday. And today, I am presenting this medal to Vance Brand.)

(That's wonderful. Thank you very much.)

It is a gold medal from Russian people to you.

(This is the emblem of the Apollo-Soyuz, yes?)

Apollo-Soyuz Test Project.

(The Apollo-Soyuz.)

(Now we are beginning the - really, we are beginning the final - the conclusion portion of our joint activities here in the Soyuz spacecraft before - No, because soon both of you - both of us will go into the Apollo. We are now beginning our space dinner because we have worked a great deal of time already, and we need some sustenance. Space dinner, as you know - There's some background noise here. There's some interference, I don't understand what it is.)

(Space food consists of several courses. I can't even hear myself. There's some interference here.)

(Moscow, this is Soyuz 2. How do you read? Over.)

(... interference. Moscow, this is Soyuz 2. How do you read? Over.)

(I hear you normally.)
(Moscow, this is Soyuz 2. How do you read? Over.)

(We read you. Let go of your intercom button.)

(Roger. We had some interference. How is the picture right now?)

(... Our space food consists of several courses: For the first course today is shchi with sauerkraut, a green shchi. Vance likes green shchi; and for me, shchi with sauerkraut. Second course we have meat, chicken with egg; for the third course, we have juices, black currant juice with sugar. We have coffee. Here we have black plums - plums and strawberries. Here we have everything that is necessary in order to prepare this food. On my right, here is our unique - kitchen. It's an electric kitchen, very comfortable and convenient to use. And I think that our house - housewife at home might be envious of such a kitchen. If I can call this a first course, it's right here. It's already heated. This is a tube which contains the food inside, and I've placed it inside and now am heating it. I would like to ask Vance how he likes our space food.)

(Yes, very much. I like, especially, your bread, the meat, and also the shchi - the soup. I think that Russian food is basically similar to American food. There is not too much of a difference.)

Hello, Houston, Apollo.

(And this evening we're scheduled to be in your spacecraft, so we'll try your food.)

(Okay.)

Hello, Houston; Apollo.

... 

Roger. You want Alexey to give a commentary about food here?
CC-H Roger. ...

SCDR-CM (Yes.)

ACDR-CM (Are you ready?)

SCDR-CM (Soyuz 1 is ready.)

14 36 34 ACDR-CM Okay. We’re up here now on our lunch. In fact, Deke has prepared most of it, since he’s in that part of the spacecraft. Alexey’s here in the center getting ready to eat. We’ll have Alexey say a few words to you.

SFE-OM (Transfer is being carried out.)

SFE-OM (I heard.)

ACDR-CM Are you reading Alexey? Soyuz, are you reading Alexey?

SFE-OM (Where is this to be plugged in? To which connector? But I don’t have the TV camera 3. It’s in the Apollo now.)

ACDR-CM Okay. They’re not – Alexey is eating some steak, some beefsteak.

SFE-OM (I’m writing, I’m writing.)

14 38 13 ACDR-CM It’s – Looks like it’s barbecued, even – like it’s roasted on a grill, but it’s in a pack that preserves it.

SCDR-CM (Sit down.)

SFE-OM (... Right now 347/10 is on 347/10-1.)

14 38 57 ACDR-CM Have you been reading Alexey before, Houston?

SCDR-CM ...

ACDR-CM Okay. I think that’s switched over to Soyuz is what – Hey, Vance, would you tell Valeriy to set Alexey up so he can talk into Houston?
While they're taking care of that, Alexey's continuing to eat his beefsteak. He also has strawberries, almonds --

(... how do you read? Over.)

Valeriy ...

(Alexey, how do you read? Over.)

Valeriy ...

(... Over.)

Tell you what, Bo. If - if you want, while we're getting the comm squared away, we can talk a little about our food over here.

Also - Hey, Vance, tell Valeriy that Alexey reads him and the rest of us loud and clear, but he can't transmit.

Okay, Bo. Well, let's press on.

(So, in the third - in the third - transfer, you don't have to do TV coverage 11.1 from the docking module. This is what Moscow said. Your TV - 11.1 TV session is canceled. Did you copy?)

Okay, Bo. We'll start on the meal here, if you're - if you're all set. I think you can see - I think you can see that Valeriy has spread out a meal for us on the table. We have a little collapsible table here on Soyuz, and right now it's covered with food that's under little rubberband-type devices, such that it won't float away. Most of the food comes either in tubes, such as what you see here, or in cans - like a tuna can - or just in packages - cellophane packages. The --

(Yes.)

(Yes.) (Laughter) There is an example of something in a cellophane package. It's bread. Now, also, there's a heater for heating up these tubes. The heater's over here on the wall. Don't know if you can quite see it. It's - anyhow, it's an electric
heater. And Valeriy, just a short time ago, put two tubes of soup in there and heated them up for us. It didn't take long for them to heat up, and so now Valeriy has just opened up one of those tubes, and he's trying a little of this soup. This is called shchi, a very common and delicious soup. Incidentally, the foods over there in the Soviet Union are somewhat similar to ours. Naturally, some dishes that are different. In general, I like things like their ice cream, bread, shish kebab, things like that. Here on the table, Valeriy seems to like his shchi very well. I think some of the best space foods are these canned meats like we have here, chicken with eggs; chicken, also tuna, various fishes are very good.

ACDR-CM (…)

14 43 39

CMP-OM Okay. We have napkins —

SCDR-CM (Valeriy, how do you read me?)

SFE-OM (Weak.)

SCDR-CM Valeriy, how do you read me?

SFE-OM (I read you very weak.)

SCDR-CM (Valeriy, I have no comm with Moscow at all. I just changed my headphones, and I'm now speaking from Deke's place. I did not do my TV coverage of space food. The way I understood you is not to do the TV seance from the docking module. 1.)

SFE-OM (2. When you come in here, take with you - take 4 cartridges with you. Did you understand?)

SCDR-CM (Roger. Over.)

14 44 39

CMP-OM Okay. So anyway, Bo, we're about to start eating, and we'll eat with knives and forks and spoons, just the way you would down on the Earth. Most of the food will stick to the spoon well enough, and things that won't, of course, will be eaten out of the tubes, or, like the bread, will be eaten in bite-sized bits. All in all, it's a very convenient setup up here. With that, unless you have any questions, I think we'll press on and eat.
ACDR-CM Okay, Bo. If you look on TV, you see Alexey eating some soup. In fact, it's potato soup.

ACDR-CM How's the soup, Alexey?

SCDR-CM Okay.

ACDR-CM All righty. You want it off now, right?

CC-H Apollo, Houston through Wa - Wallops for approximately 5 minutes.

ACDR-DM Roger. Through Wallops.

CC-H 1 minute until LOS. Next AOS is Santiago at 75:10.

ACDR-DM What? Yeah, what?

TIME SKIP

CMP-OM Tom, how do you read? How do you read, Tom?

ACDR-DM I read you, Vance. Vance, how do you read?

CMP-OM Okay. How's the transfer going?

ACDR-DM Okay. We're getting ready ... It's been a little slow here. ... did the relay come from Houston?

CMP-OM No, haven't heard - heard them, lately.

ACDR-DM Okay. I wonder about this furnace shutdown here.

DMP-CM Okay. I think you're supposed to go on schedule, Tom, ...

ACDR-DM Is the green light on?

DMP-CM ...

ACDR-DM Okay, group, we'd better synchronize the clock; it's 8 minutes, right?

DMP-CM Check. ... How do you read, Vance?
CMF-OM I read you fine.

DMF-CM Okay. You've got about 30 seconds ... clock.

DMF-CM ... Okay ...

CMP-OM I read you.

ACDR-DM ... I got ... but we haven't put any stuff through here.

DMF-CM Yeah.

15 29 03 ACDR-DM Roger. Hey, Bo, this is Tom. I'm in the docking module working on step 2 of the third transfer. Do you want us to go up here and - and go through this checklist ... removing these samples.

15 29 24 ACDR-DM Okay. The temperature's 29 degrees and the FURNACE COOL light's on, so we can go do it.

ACDR-DM I got it. I've already got it marked out.

15 30 14 ACDR-DM All right, Bo.

CC-H ...

ACDR-DM Yeah. ...

ACDR-DM Yeah. ...

DMF-CM ...

ACDR-DM Yeah. ...

15 32 33 ACDR-DM Okay. Try it. Got it?

ACDR-DM What about that ...? Weren't we supposed to ...? In 5 minutes, ... transfer to ... I ...

ACDR-DM Oh, yeah.

15 34 49 ACDR-DM Yeah. I found it. Yep, it's there ...

CMP-OM Tom.

ACDR-DM ... difference between ... Okay.
DMP-CM  Vance ...

ACDR-DM  Okay.

ACDR-DM  Okay.

DMP-CM  Oh, okay. All right.

ACDR-DM  Yeah.

DMP-CM  ...

ACDR-DM  ...

DMP  ... yeah.

ACDR-DM  They're all ON, Bo.

ACDR-DM  Thought they were.

ACDR-DM  Yeah.

SFE-OM  Apollo, Soyuz. How do you read me?

SFE-OM  Apollo, Soyuz. How do you read me?

DMP-CM  (I hear you excellently, Valeriy. Stand by.)

SFE-OM  What step are you doing now?

DMP-CM  Okay. They want to know what step you're on there.

SFE-OM  Apollo, Soyuz. What step are - step are you doing now?

SFE-OM  Please, Apollo. What step are you doing now?

ACDR-DM  (Step 2.)

ACDR-DM  ... Take that ... over. ...

DMP-CM  Okay.

CMF-OM  Yeah. Yeah.

ACDR-DM  Go ahead, Bo.

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ACDR-DM Yeah, it was. We started the transfer time on schedule. We had to go back and pick up the furnace sample and sign in a couple of books and things.

ACDR-DM Okay?

15 42 04 ACDR-DM Roger. We'll be making it up.

15 43 10 ACDR-DM Okay. ... I thought we were eating and didn't discuss that ... I'll come and get it. Okay. Take that off? Okay, I'm going to -

DMP-CM Okay. ... is closed.

15 44 55 ACDR-DM Yeah, well. ... Oh yeah. (Laughter)

15 45 35 ACDR-DM Okay. Hatch 2's closed. (Hatch 2's closed ...)

SFE-OM ...

ACDR-DM (Valeriy, Vance, now I'm working on step 7 in the docking module.)

CMP-DM (Step 7.)

15 46 26 SFE-OM Soyuz tunnel 2 pressure equalization.

DMP-CM ..., Bo, are you reading okay?

DMP-CM Okay. Yeah, I got mixed up. Our commentary says ...

15 47 08 ACDR-DM (Soyuz, this is Apollo. I am now beginning pressurization.)

15 48 04 ACDR-DM Okay, Bo. We're pressurizing the DM.

16 02 16 SCDR-DM (I used the last film for it.)

16 05 34 ACDR-DM (Valeriy, do you need any nitrogen?)

ACDR-DM ... how do you read - docking module?
ACDR-DM: Okay. Up to step 13 now. Looks like we're back on schedule and appreciate your help on the rapid check on hatch 2.

ACDR-DM: Pardon me, no; it was step 15. I couldn't read this thing. I've already gone through 13. We're up to step 15.

16 06 30 ACDR-DM: (All right.)

ACDR-DM: And they don't need any nitrogen.

16 07 52 ACDR-DM: Hello, Houston, docking module.

ACDR-DM: Everything is going smooth here. Is Lunney around there?

ACDR-DM: Okay. You might tell him - I don't know whether I mentioned it or not - I just happened to check the roll index angle that we put on, you know, between the command module and the docking module.

ACDR-DM: It's about as close as you can get it to zero. Maybe it's less than a 20th to a 50th of a degree off.

16 08 25 ACDR-DM: Yeah. (Laughter) In other words, the zero line is just darn near splitting the other index line.

16 10 39 CC-M: (Well, how's the comm check.)

CC-M: (End 22 4 comm check.)

16 15 48 ACDR-OM: Houston, Apollo. How do you read me over in the orbital module?

ACDR-OM: Roger; Bo. Read you 5 by. All connected up for the comm over here in the OM.

16 17 15 SFE-OM: Deke, how do you read me?

DMP-CM: (Excellently, Valeriy.)

SFE-OM: (This is Soyuz. How do you read? Over.)
DMP-CM  Go ahead, Bo.

16 18 40 DMP-CM Okay. CM 1 and 2 coming OFF.

ACDR-OM Yeah.

16 23 01 SFE-OM Vance, how do you read me?

DMP-DM (I read you excellently.)

SCDR-OM (Valeriy, how do you hear me?)

SCDR-OM (Okay, Valeriy, how do you read me? I don't read you now.)

16 23 35 ACDR-OM Houston, Apollo.

ACDR-OM Okay, Bo. Sounds like Valeriy's having the same trouble Alexey had this morning. He can read everybody, but he can't transmit. But Vance and him are going to press right on through the transfer.

ACDR-OM Roger. Will do.

16 24 15 ACDR-OM Roger. 1, 2, 3, 4, 5, (5, 4, 3, 2, 1. How did you read that?)

SCDR-OM Houston, this is Soyuz commander. How do you read me?

SCDR-OM I give you short: 1, 2, 3, 4, 5 - 5, 4, 3, 2, 1. How do you read me?

SCDR-OM I read you loud and clear, too.

ACDR-OM Okay. I'll check with Mos*** (Moscow, Moscow, how do you read me? This is Apollo commander.)

ACDR-OM Houston, this is Tom. It says in the Flight Plan you want us to check with Moscow, too? Over.

CC-H That's right ...
ACDR-OM (Moscow, Moscow. How do you read me?)

ACDR-OM (Moscow, Moscow, this is Apollo. How do you read? Over.)

ACDR-OM Bo, I don't get them anywhere. Maybe we're configured wrong back on the command module. I don't know.

ACDR-OM Okay. ...

ACDR-OM (Moscow, Moscow. This is Apollo. How do you read? Over.)

SFE-DM (Valeriy, Soyuz 2. I hear you well.)

SFE-DM (What did you say?)

SFE-DM (Roger.)

SFE-DM (Micro - VRT power - that is microphone power's turned on. Intercom light is on.)

ACDR-OM (Moscow, Moscow, this is Apollo. How do you read me?)

ACDR-OM Roger. (Yes, I hear you excellently.)

SCDR-OM Roger. Hatch 4 is closed.

CMP-DM (Good.)

SCDR-OM Moscow, this is Soyuz. I read you loud and clear.

SCDR-OM Okay.

ACDR-OM Hello, Bob. How is it going?

MCC-M ...

ACDR-OM (Alexey, are you ready to dump pressure in tunnel 2?)

SCDR-OM Just a moment, just a moment.

DMP-CM Okay.

ACDR-OM (Okay. Roger, Bo. Roger.)

SCDR-OM Deke, hatch number 4 is closed. Ready for tunnel 2 depressurization.
SCDR-OM (Standing by, Moscow.)

SCDR-OM (Read you very well. The second comm check --)

16 33 21 SCDR-OM (Okay, I know, I hear you.)

16 38 37 ACDR-OM Roger. 76:44, Quito. Thank you.

16 40 35 CMP-DM Soyuz, this is Apollo. Hatch 3 and 4 pressure integrity okay.

SCDR-OM Roger. I will have my results in 2 minutes.

16 42 49 SCDR-OM Vance, the results of our pressure check are okay. Go ahead.

16 47 46 DMP-CM Do you read, Tom?

ACDR-OM Hello. Yeah, go head, Deke.

DMP-CM Rog. ...

ACDR-OM Deke, did you call?

DMP-CM Yeah. I'm looking for the floodlight[?] ...

ACDR-OM Read you about 3 by 3. Go ahead.

DMP-CM ... I was looking for the floodlight[?]. Did you have that up in the DM?

16 50 37 CMP-DM ...

16 55 22 USSR Go ahead.

16 57 53 ACDR-OM (Hello. Good day. Hello. Good morning -)

16 59 00 ACDR-OM (...)

16 59 33 ACDR-OM (...)

16 59 59 DMP-CM Okay. ...

SCDR-OM What did you say that ... What are you going ... What do you mean, spacecraft or cable?

TIME SKIP

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(First of all, we found out that we can work together in space and cooperate. If - until this time, we had only been preparing for it - training it. Now we have tested it out in practice. Yesterday and today have proved to us that at the time of our meeting in space - during our rendezvous, our docking, and now during the time of joint activities - we accomplished it all. And this is the most important thing. This proved that we can work together; we can cooperate in space and, secondly, we checked out and proved that the docking system works - that it works as it was designed. In other words, that the technical ideas that had been - and the technical design and the ideas that had been used have proven themselves. Yesterday this was also proven. Thirdly, of course, we received additional flight experience at the same time on - in two spacecraft. This would give us a great deal in terms of training or preparing for future flights.)

Well, I think the greatest part of our learning, Bo, has been in our training, ... ... I think - I've learned a lot - I think, of course, that if we had another joint flight someday that I'd find it much easier to approach, and if somebody else was on this flight, I'd have a lot of suggestions for him. And I'd certainly recommend such a thing, incidentally.

(Today, I have spent 6 hours aboard the spacecraft Apollo in flight - in space, but before this I had been aboard this spacecraft many times before in training. And as a pilot, as a cosmonaut, I like this spacecraft very much. Its appearance, its maneuverability, its capabilities; but, of course, the Apollo has proven itself already - that it's a reliable spacecraft, which makes it possible to accomplish many difficult missions. And even the most difficult mission, which is - involves flying around the Moon and even partially a landing mission. Today I saw it - how it looks in space flight. I like its capabilities for making observations. There are a sufficiently large number of windows to observe the Earth and its equipment. Today, in our flight, I had to do a TV report about space food from onboard the Apollo spacecraft, but for technical reasons it didn't come through because there was no communication. But I can say that the food, which I selected way back on Earth, was the same here and I liked it very
much. I liked the way it's prepared, its freshness, and also with the - in the terms of attention paid by the crew. But once again, I'd like to say that space food is not the same food, which is eaten by people on Earth, no.) But as an old philosopher says, "The best part of a good dinner is not what you eat but with whom you eat." Today I have dinner together with my very good friends Tom Stafford and Deke Slayton because it was best part of my dinner.

17 50 00 DMP-CM ...

17 51 28 SCDR-OM (I am deeply convinced that all of us now - those that are flying aboard spacecraft and those who are not flying, but who are watching and listening to us - all of us are participants of only the beginning of a great human journey into outer space, and there will be all kinds of various space missions in the future. Of course, I would like to once again to be aboard some other spacecraft, which would be able to fly for a long time around the Earth so that with the eyes of an artist I could see the multifaceted appearance of our Earth in very varied colors and appearances to forever retain it into memory and to give it to people. But also we would like - I would like to be at altitudes higher than we are now. From there, the Earth looks completely different. I think that at the beginning of our journey - I think that I am at the beginning of my journey and still we have - we have still a reserve of strength and age and I think we will participate in future space missions.)

17 53 04 ACDR-OM Well, you're talking about the next mission. I would think, naturally, with the background in flight tests that you'd always like to fly a new and a better and a more modern device, and we have one coming along called the Shuttle. I would certainly like to fly that. And I would hope that if Alexey would have a vehicle developed by their country that we could fly maybe in a joint mission. And that would be my - my wish: since man's progress has always been a geometric progress and the benefits derived from science and technology has always helped all of mankind - I would hope that the next mission - say if I do fly one - will be one of the more modern type of vehicle that could have more benefits for everybody.
SCDR-OM (And I also agree with Tom and I'd like to say that it's - the spacecraft is one thing, but another thing is with whom you're flying and I'd - this is what I'd like to point out, that I would always like to fly in space with friends to whom one trusts and who trusts in one and with whom it is not dull to work with.)

ACDR-OM (Of course, it is very important.) I say, of course, it was necessary again. We developed this technique out of working together over a period of nearly a year, and that was over a year and a half ago that we determined that, if we would listen to the other person speak in your own tongue, the individual would speak slower, also more distinctly, and would make fewer mistakes. And so it worked out beautiful as you saw in the rendezvous, and the end results you saw on television, and what you're seeing now. It's also been a great experience for us as far as a - way of communicating with each other. Over.

SCDR-OM (We - when we began working on the Apollo-Soyuz Program, the first part of our program was the working out of a rescue system and of a single, androgynous docking unit and testing of that unit. And now we can say that we have done - we have completed the major part - basic part of this program. We have tested these docking units. They work well and they hold us together tightly - strongly. This was the beginning of a large effort in standardizing future systems not just with both our governments or both our countries because future spacecrafts of our country and of the United States would use such units. But we suggest that other states - other countries which will dev - begin developing in this direction, we suggest that they should also have standardized docking units, so that they would be able to perform any kind of service and render any type of assistance to other crews in space. And it is pleasant to us that the beginning of this great grandiose human effort in space has been initiated by our crews here - by our crews of the spacecraft Apollo and the crew of the spacecraft Soyuz.)

CMP-CM Well, I think frankly, that the chances are very good, but I don't think it will happen right away. They say that - well, it would probably take at least 20 or 30 years before we would be ready as a world
to go out and explore a planet. I think that's probably reasonable. The only thing, in everything else that we have done, in aviation, for example, we've found that progress was always much faster than we expected. So perhaps the time will come when we will be thinking of exploring planets, probably together - within the next 20 years. I think that would be the way to do it. I think it would save us time, effort, money; it would pool resources, it would - in other words, it would be interesting and it would bring ben - bring back benefits to the whole world.

MCC-H Thank you, Vance. ...

17 58 42 ACDR-OM Well, when - as long as you have motion, you're going to have accidents. Needless to say that - we do all our - our utmost efforts to minimize all the risk. However, after a long period of time, you could conceivably and possibly have some mishap that would require a rescue. The total system we have demonstrated here - that new docking device, the rendezvous system using techniques from both countries, the communications procedures and techniques - could be available in the future if required. Not on an instant's notice, but it could be available. So I think we have taken a great step, that indeed we have opened a new era in the history of man on this, and it will be beneficial. Over.

17 59 47 SCDR-OM Thank you very much.

DMP-CM Okay. Now we're going to get the film. Okay.

SCDR-OM Valeriy, how do you read me?

SFE-CM Okay.

ACDR-OM Bo, how's the weather back in Houston?

DMP-CM Okay, we'd better start getting to work here, I guess.

CMP-CM Okay. ...

18 07 13 DMP-CM Okay, thank you.

DMP-CM Okay, I'll ... regular, anyway. ... your ...
Yep.

Okay, the problem is we've got ... right now.

Never can be sure. ...

... Valeriy.

Oh, I know, I know why ... ...

Okay. Well, ... the ... thing that I do is Earth obs. ... cloud cover ...

... Yeah.

Okay. ... the floodlight down here. ...

Okay. ...

Alexey.

(Soyuz, how do you hear me?)

(Alexey, how do you hear me?)

Okay. Now.

...

Okay. ... Valeriy, (...) Got that. (...) Okay. (...)

How about letting me ...

Yeah, I've been looking for the cottonpickin' camera, only ... can't find it.

Well, take the one here, take the handheld, and ...

(Okay. Please speak.)

(...)

Okay. Boy, we've got some reconfiguring to do here.

...
Okay. ...

Okay.

Okay. Well, we've got to change the lens on the other camera. I'm pretty sure.

...

Yeah. Right. Remove wide angle. Now if I can find the wide angle.

...

What?

...

Oh. Well, I'm looking. I'm kind of worried, though, because I haven't found it. Oh wait. Oh boy, I wonder where it is.

Not there.

Nope.

... Tom ...

No telling where he put it.

Would you call him, I wasn't able to get him a minute ago. I sure can't find it. I don't know what it looks like.

...

Hey, Tom, how do you read?

Loud and clear. How me?

Okay I've got you now. Hey, we're really hanging here, looking for the - the zoom lens for the TV. Do you happen to remember where that is? It's not in F-2.

It's not in F-2?

No.
ACDR-OM  Perhaps it's on the left side of the couch.

DMP-CM  Wait a minute.

ACDR-OM  Are you sure you don't have it up?

CMP-CM  Okay. It's just that --

ACDR-OM  You know, I bet you'll find it up because that's where it was set up. I changed it out after - the tour yesterday. ... where it said change it to a wide angle.

CMP-CM  Well. It's not in F-1, is it?

DMP-CM  No. I doubt it. ... put it there because ... right.

CMP-CM  Okay. Why don't you just go ahead and set up the angles, and I'll keep looking. Oh, boy. How in the heck - here it is. God damn.

ACDR-OM  The only other place I can think is ... look in one of those TSBs, you know, either somewhere on the right or the left.

CMP-CM  Okay. We found it. We found it.

ACDR-OM  Where was it?

CMP-CM  It was toward the very back of F-1.

ACDR-OM  You mean F-2, don't you?

CMP-CM  I mean F-2.

ACDR-OM  Yeah. Okay. ... --

CMP-CM  There you go.

ACDR-OM  -- in F-2 ...

DMP-CM  Okay. ... I'm supposed to disconnect ... and move it here.

CMP-CM  Okay.

DMP-CM  I can't because I've got to go backwards, ...
Okay. What CCU do you want ...?

... 9 ... 8.

Can you install it there?

...

Okay.

I'll bet you those valves ...

...

...

...

...

Did already. ...

...

That camera in back of me won't see anything any-
way. Nope. Oops. Okay. Valeriy, we got a good
scene. This is a crazy attitude.

...

Yeah. I guess I must be going backwards. Well,
sideways at least.

Okay. Can I have your - comm cable Deke?

Yeah.

Thanks.

Houston, Apollo. How do you read? ... Okay. ...

Ah. Okay. (Fine.) Houston, Apollo. How do you
read? Houston, Apollo. Okay, no? Well, maybe we're
too early.

Got to keep ...
18 40 34 CMP-CM Houston, Apollo. How do you read?

CMP-CM ...

CMP-CM Yeah. ... What do you think this is, Deke? Yeah. Do you know what it is? Yeah. I see. I was just wondering if you'd recognize it. Okay.

18 41 30 CC-H Apollo, Houston through MILA. Over.

18 41 37 CMP-CM Okay. Now - Let's see what we got to catch up on here.

18 54 05 SCDR-OM (Kubasov. Kubasov.)

CMP-CM Valeriy.

SFE-CM ...

18 54 18 CMP-CM (Speak.)

SFE-CM (...)

SCDR-OM Hey, Kubasov.

SFE-CM (Who is calling Soyuz 2?)

SCDR-OM (I am Soyuz. I am calling you.)

SFE-CM (What's the matter, Soyuz 2?)

18 54 37 SCDR-OM (Listen, did you connect TK-3 connector to J-box?)

CMP-CM Okay. This must be the - kit number 4.

SCDR-OM (Roger.)

18 55 03 CMP-CM Go ahead.

SCDR-OM (Moscow, this is Soyuz. How do you read me?)

SCDR-OM (Moscow, when I came over there, I connected our TK-3 and mounted it there. Then, I returned it to another mount, but I didn't disconnect the connector according to the documentation.)

SCDR-OM (I wasn't supposed to do it anyway. Moscow, did you copy?)

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18 55 53 CMP-CM Gee, Bo, would you try again? You were cut out there, then.

18 56 10 CMP-CM Hey, Deke. If you're through, why, just put ... on sampling. If you're through there, we've got to finish the sampling and get going on that -

18 56 28 ACDR-OM Go ahead, Bo.

19 00 32 ACDR-OM Roger. Did you want to cover this presentation of seeds and these medals on TV? Over.

CC-H Roger. And we see you on TV now.

19 01 24 USA (... very well ... to MCC-Houston ...)

USA Affirmative.

USSR' (...) CC-H Command module, Houston.

DMP-CM Roger.

19 02 04 CC-H On panel 10, we would like to request you to check the S BAND thumbwheel to 3.

SCDR-OM ... you must have ...

CC-H Command module, Houston. Over.

CC-H Command module, Houston. That was the FM thumbwheel to 3.

SCDR-OM You will hold the ... please, beginning ...

ACDR-OM Okay, Bo. You ready?

CC-H Roger. We can see you holding the box there.

ACDR-OM Okay. (I'm beginning. Allow me to present to you on behalf of the United States of America, to give your people and your government a present of the United States, a present to your people.)

19 03 10 SCDR-OM I am sure good trees must grow from these seeds.
CC-H Apollo commander, Houston. We're not reading Alexey.

USA (... our contact ...)

ACDR-OM Okay. Say again, Bo. Did you see that?

CC-H We read you, but we didn't read Alexey during the last part of his acceptance.

SCDR-OM (How do you read me?) How do you read me?

CC-H (Now we read you, Alexey.)

USA ... get back to ...

ACDR-OM (Joint medal for the Soyuz-Apollo mission between the United States of America and the Soviet Union.)

19 04 49 SCDR-OM (Good evening, dear television viewers. ... it's already 22:00 hours in Moscow time. The final operations are taking place aboard the spacecraft. At this time - Tom, a little bit lower. That's it. Lower. At this time, aboard the Soyuz spacecraft we have Apollo commander Tom Stafford, while Valeriy together with Vance Brand and Deke Slayton are aboard Apollo. Our joint operations are coming to an end. We are concluding ...)

USA ... Apollo ... Number 330, Roger.

SCDR-OM (Our final operations ... Tom Stafford gave me pine seeds in this little red container - box ...)

USA ... Apollo ... read your ...

19 06 49 SCDR-OM (... growth on the territory of our nation. The final operations - medals joined in space. One half of the medal was launched aboard Apollo, and the second half of the medal was launched on Soyuz. And now we here in the orbit of an artificial Earth satellite - we join these two halves, Tom. The medal carries the emblem of our flight - docked Apollo and Soyuz spacecraft. On the reverse, two flags side-by-side - the flags of the Soviet Union and the United States of America. I am giving this medal to Tom Stafford, and Valeriy Kubasov will bring back from Apollo the other medal, which we will return to the Soviet Union.)
19 07 19  ACDR-OM  Okay. (Thank you very much.)

19 07 26  SCDR-OM  (What have we done in this time? We had very satu-
rated program - had to do quite a number of opera-
tions in a very limited amount of time. We had to
do a series of transfers, also watch the systems on-
board our spacecraft. All this requires very careful
monitoring, very careful observations. Also, at the
same time, we had to perform a whole series of reports,
still pictures, movies. We only had five people here
between the two spacecrafts - five crewmembers, and
that's really not enough people to do all the things
that we had to do, but we had to find a way to do it.)

19 08 27  ACDR-OM  Okay, Houston.

SCDR-OM  (Give us the image ...)

SCDR-OM  (... how and where.)

ACDR-OM  Okay. Command module, say again.

SCDR-OM  (Who turned it off? We really shouldn't have any-
thing bother anybody.)

19 09 36  ACDR-OM  Vance, how do you read?

ACDR-OM  Deke, how do you read?

DMP-CM  ...

ACDR-OM  Okay. I was just trying to get through with the rest
of the - Deke and Vance are putting the - those medali-
lions together with Valeriy. They want - they're
going to say something on TV, I was listening here.

SCDR-OM  (Roger.)

19 11 27  CMP-CM  Go ahead, Houston.

CC-H  ...

CMP-CM  (Yeah, we don't have the filter.)

CMP-CM  Okay. We can look again.

CMP-CM  Deke, do you mind -
DMP-CM    Yeah.

CMP-CM    Do you mind, kind of letting me get by here and I'll check for that filter again. But I sure don't know where it went. On that ... camera filters. Maybe I can find it.

CMP-CM    ...

DMP-CM    Yeah. Let me get ...

ACDR-OM   Vance, how do you read; I haven't been reading you at all.

CMP-CM    Okay, Houston. Reading you loud and clear; and, Tom, reading you loud and clear.

ACDR-OM   Okay. I can read you now.

CMP-CM    ... Okay.

CMP-CM    Okeydoke.

DMP-CM    - been up to.

DMP-CM    Okay. You getting ... down there?

CMP-CM    Yeah. I'm setting clock sync. If I can find it - if I can find the time.

DMP-CM    ...

ACDR-OM   How do you read me?

CMP-CM    (Soyuz, this is Apollo.)

SCDR-OM   Yes.

CMP-CM    (Giving count down now. '7, 6, 5, 4, 3, 2, 1 - )
19 16 04 CMP-CM MARK.

SCDR-OM We are synchronized.

CMP-CM (That's good.)

DMP-CM Okay. That damn clock ...

CMP-CM No.

DMP-CM ... worry about that. ...

CMP-CM Okay.

SCDR-OM (...)

CMP-CM (Yes. Yes.) Okay. (The other ...) Hey, ...

CMP-CM If Bo will what?

DMP-CM The filters aren't ..., Bo.

CMP-CM All right. We're looking for the big camera filter, Bo. Hey, Tom, have you seen that?

ACDR-OM Hey, Vance. It was either back on the one in 605 or in F-2.


DMP-CM That's where it was the last I saw it, was in F-2.

SCDR-OM Tom.

DMP-CM Okay. Let's press on here. We're getting —

CMP-CM Yeah.

SCDR-OM (...)

ACDR-OM (Yes. ...)

19 18 11 CMP-CM Okay.

SCDR-OM Tom.

CMP-CM '(The hatch is open.)
ACDR-OM ...
SCDR-OM ...
CMP-CM (The hatch is open.)
DMP-CM Also, there's ... down here.
CMP-CM Yeah. ... say docking ... No. Let's look under the ... here ...

19 18 43 DMP-CM Okay.
DMP-CM (Okay. Please.)
CMP-CM (...) Yeah.
CMP-CM (Yes. ...) Yeah. ... 
CMP-CM Got you. Okay. ...
ACDR-OM ... in the bag. ... in the bag. ... which bag did you look?
DMP-CM Okay. I'll just put these back ...

19 22 08 CMP-CM I think we should put these back in here, too. ... Where do you want me to put them ... Where do we ...? In what?
DMP-CM ...
CMP-CM Hey, they're falling apart.
DMP-CM ...

19 23 00 CMP-CM ... Okay. (Open. Yes, yes.)
DMP-CM No, not in ...
CMP-CM Huh?
DMP-CM ...
CMP-CM ...
DMP-CM  Yeah.
CMP-CM  You give me ours?
DMP-CM  ... ours ...
CMP-CM  Oh, okay. Good. (Good. This is - gave - I -)
ACDR-OM  ...
CMP-CM  ... Yeah. ... Yep.
DMP-CM  ...
CMP-CM  Okay. Except we've got something for him.
DMP-CM  ...
CMP-CM  Okay.

19 23 56
DMP-CM  Valeriy? (...)
CMP-CM  (Our hatch is open.)
DMP-CM  ...
CMP-CM  Yeah. (Help ...)
CMP-CM  (After the flight, how do you say ... In America, we will print the time of launch and landing.) (Laughter) Lift-off and ... landing.

19 25 48
CMP-CM  (What) Oh, yeah. Yeah. (This is -)
DMP-CM  Okay. I've got the film.
CMP-CM  (Yes. This is film.)
CMP-CM  Oh! Okay.
DMP-CM  Okay. I'm going up in the DM.
CMP-CM  Okay.
DMP-CM  ...
CMP-CM  Where's the DM Checklist --
DMP-CM I don't know, but where'd you put it ...

19 26 24 DMP-DM Okay. Okay. (We're beginning operations in the
docking module.)

DMP-DM I think I put it there, Vance. Check and see.

CMP-CM Okay. All right.

19 26 40 DMP-DM Okay, Bo, if you're reading, I got the 35 flash ...

CC-H ...

CMP-CM Okay. I'm stowing AS-2 kits 3 and 4, ...

DMP-DM Okay, that's the --

CMP-CM The bungee bags. Yeah.

DMP-DM I got them now. I think we ...

DMP-DM Okay. And I'll turn off the TV STATION SELECT
and do the TV things here.

DMP-DM Okay. And I'll head for the DM.

CMP-CM Okay, just - yeah. You've packed the - you're -
you're ... It's the DM TV camera prep, if you will.

DMP-DM ... --

CMP-CM Yeah.

DMP-DM -- what to do.

CMP-CM Okay.

DMP-DM ...

CMP-CM Okay.

19 28 16 CMP-CM Okay. Guys do a ...

CMP-CM Go ahead, Bo.

CMP-CM Oh, okay. No.

ACDR-OM ... We're just finishing up --
19 29 04  ACDR-OM We've had a wonderful experience here. And Alexey and I are looking at the procedures to go through now. We also had a snack.

ACDR-OM Bo, are you sending the TV over to the Soviet Union at this time? Over.

ACDR-OM I'd like to just say hello to the people there.

ACDR-OM Okay.

USSR ...

ACDR-OM Okay. It'll take about a minute or 2.

CMP-CM Yeah. Oh. Deke, the ... --

ACDR-OM (Dear Soviet television viewers. Allow me as the representative of the United States of America to send to you best regards from the people of the United States. This is a happy time for the whole crew. We're happy, very happy to receive - to be together here in the first international flight after 2 years of joint preparation and training. We astronauts and cosmonauts - not only - not only have worked together, but we've become good friends. I'm sure that our joint work, friendship, will continue, even after this flight.)
(I am also sure, dear television viewers, that this flight will open the way to further cooperation and friendship between our two countries. The - yesterday's - let the things that went on yesterday and today in our flight be a good thing for both of our peoples. Thank you and good luck.)

Hey, Bo, you reading the DM?

Okay. Over. Which TMs - or TV do you want back in here? We took one out, you know, and I'm supposed to check the monitor, and we've got nothing here --

Ladies and gentlemen of the press. You can see with me Tom Stafford, Soyuz - Apollo commander, today in space --

We ... see --

-- in orbital module of the Soyuz spacecraft, the representatives of two countries: Soviet Union and the United States - United States and Soviet Union. We are conducting - we are conducting our Soviet --

... 

-- our joint Soviet/American flight because our people --

Yeah.

-- and our governments want to work together in spirit of cooperation between our country, because a lot of experts in the America and in the Soviet Union did a great job to make this flight possible. We worked together during - for 2 - for 2-1/2 years. We know each other very well. I know Tom Stafford; Deke Slayton, and Vance Brand are very hard-working guys. We like working together with them. Before our joint flight, we were a lot of times in the United States and the American astronauts were a lot
of times in the Soviet Union. Every time we knew each other better and better. We know a lot about America, American people, about American customs. We know what the American people want. I am very glad that today we work - we are working in space together with our good friends, Tom, Deke, and Vance. I'm sure that our joint flight is the beginning of very great cooperation in space. Thank you very much.

DMP-DM Go ahead, Bo.
ACDR-OM ... How do you read?
DMP-DM Yes, but which one?
ACDR-OM ...
DMP-DM You going to replace the one under ...?
ACDR-OM Hey, Deke, what step are you doing now?
DMP-DM Okay. I thought you wanted the TSB ...
DMP-DM Okay, ...

19 35 37 SCDR-OM Deke, how do you read me?
DMP-DM (Excellent, Alexey.)
SCDR-OM What are you doing now?
DMP-DM (First ...)
19 36 07 SCDR-OM (How do you read me?)

TIME SKIP
20 01 59 CMP-CM Bo, how do you read? CP.
20 02 57 DMP-DM ... Over.
CMP-CM Go ahead, Deke.
DMP-DM (... pressure ...)
20 03 37 SCDR-OM Partial pressure oxygen 120, CO₂ 4 millimeters. Okay?
ACDR-OM Yeah.
20 05 00 SCDR-OM Okay. We're going to proceed to open hatch number 4.
20 06 10 SCDR-OM Hatch number 4 is open.
CMP-CM ...
20 18 03 CMP-CM Roger. Loud and clear.
CMP-CM Okay.
ACDR-OM Hey there, Bo. We're all over in the DM here — or OM, rather —
SCDR-OM (Laughter) Houston ... (laughter), Houston.
ACDR-OM — with the old microbial exchange.
ACDR-OM Right.
CMP-CM Okay, Bo.
20 20 48 SFE-DM (Moscow, this is Soyuz 2.)
SFE-DM (... Not bad. How do you read, Moscow? This is Soyuz.)
SCDR-OM (Moscow, this is Soyuz. The situation onboard is as follows: We're conducting the microbial flora sampling experiment; hatch 4 is open; final operation of the fourth transfer.)
20 21 39 CC-H Apollo, Houston. Through Newfoundland and then ATS.
CMP-CM Okay, Bo.
DMP-DM  We're on step 16, Bo.

USSR  (... Story.)

USSR  (... of the fourth transfer.)

CC-H  Did you understand. Step number 16 and if you have a DM Checklist in your hand, would you go to page 5-16, step 26.

DMP-DM  Okay. Go ahead.

CC-H  Deke, did you answer me? I thought I heard you very weakly.

DMP-DM  Rog. Standing by for your info.

20 22 26  CC-H  Roger. Where it says, "AC DM SOYUZ TUNNEL VENT ISOLATION - OPEN and DM SOYUZ TUNNEL VENT - VENT." Cross those two steps out, temporarily, and the Soyuz crew will give you an okay to vent the tunnel to vacuum.

DMP-DM  Okay, do that later ...

CC-M  (Repeat Soyuz 2.)

CC-M  (... 1 millimeter)

USA  Yeah.

CC-H  They'll give you that okay later - perhaps 20 minutes or a half hour later.

DMP-DM  Okay.

DMP-DM  Good.

SCDR-OM  (Okay, so the first phase is 6 minutes. The standard is 10 over a period of 6 minutes. For the second phase, after 20 minutes, the standard is 1 millimeter for 6 minutes and the ...)

USSR  ...

DMP-DM  Well --
(Okay, I'll clarify it one more time. Are you listening? Two phases: First phase 6 minutes; standard is 10 for 6 minutes. Second step: In 20 minutes, standard is 1 millimeter for 6. If everything is normal, inform Apollo about hatch integrity and close the caps.)

USSR (... respectively.)

SFE-OM (And at what time?)

DMP-DM (... 00, 54:01:09.00 each.)

USSR (What happened?)

ACDR ...

CMP-CM Okay.

ACDR-OM Okay.

USSR-OM (...)

USSR-OM (...)

ACDR-OM Okay, Bo. We're hooking up to the - the TV cameras in the orbital module to DML on the docking module.

CC-H ... the report.

USSR ...

USSR ...

CMP No, you just got rid of it, Bo.

DMP Sounds good now, Bo.

ACDR Yeah.

ACDR Roger. You're all set.

DMP-OM Yeah. They've been up for a while, Bo. They're already turned on.

CC-H ...
Go ahead.

... 

Okay.

... 

Yeah, that's verified. It's ON.

TV STATION SELECT is on CM, however - would you like that - UP TELEMETRY?

... 

You got it.

Okay.

(Good-by.)

(Good-by.)

(Good-by. We wish you the best of success.) We hope we've opened a new era in history of man.

Good luck.

(Our next meeting will be on the ground.)

(Step 20, Valeriy.)

20 is completed.

Hey, Vance, can you read us?

Yeah. Go ahead.

Hey, Vance, you read?


Okay, got to do a little reconfiguring here on panel 6: VHF FM to RECEIVE; AM, OFF; AUDIO CONTROL, NORMAL; verify POWER, OFF.
Okay. It's in work.

POWER coming OFF now.

Okay, Vance. At panel 6 here, FM, T/R; AM, T/R, POWER ...

(Two shutters.)

Okay, Bo. Valeriy's working on their hatch and getting things set up for the UVA eclipse.

Solar eclipse.

Okay, they're closing hatch 4.

Tunnel is closed. Hatch 3 is closed. (Hatch 3.)

Vance, you read? Vance, you read us?

Hello, there.

Vance, how do you read?

Vance, you read?

(...)

(Soyuz, how do you read me?)

How do you read, Tom? How do you read, Tom?

Loud and clear, Vance.

Okay. I assume you got the connector cables disconnected.

Yeah, right. ... disconnected those power ...

Okay, we must be out of configuration.

Okay. Vance, would you set MASTER on the CM camera?

Rog. MASTER on the CM.

Houston, Apollo.

Houston --
Houston, Apollo.

Roger. I have P52 results for you.

Okay, stars 33 and 35; NOUN 05, all balls; NOUN 93, plus 00.129, minus 00.084, minus 00.088; and we torqued at 43:00.

Roger.

(Soyuz, this is Apollo. We're getting ready to dump the pressure in tunnel 2. Over.)

We are ready.

(Read you.)

(I'm beginning the dump.)

Hey, Tom. I've got the probe and the drogue in the tunnel. When you come through, we might temporarily put them in the DM so we've got a little working room.

Yeah, I think that's a great idea. Let's go ahead and we'll - we'll stow them up here for tonight. What do you think?

Super idea.

Roger.

Roger. Three POWER switches going OFF.

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

(Real good.)

(I'm beginning the maneuver for solar orientation.)

...

(Yes, right now. Roger. ... how is everything going?)

(Soyuz, Apollo. Do you read me? You do ...)

Okay. Understand you. (...)

238
Okay, Vance. Let's position the ... valve.

Okay.

... five of up, too. Okay? I'm going to send container 4 up, too.

Water?

No.

Seems to me that we're safe[?] for a few days.

Deke, how do you read me?

(Okay, Valeriy.)

We forgot four ... magazines.

(... repeat please.)

We for ... magazines, in the DAC.

(...)

... We took film using DAC 02 - these magazines we forget - we forgot on the Apollo spacecraft. Do you understand me?

(Yes, understand, but ... when you land - after that, okay?)

You have to land it?

(Yes.)

Hello, Dick. How are you? Good to hear your voice.

Hello, Dick. How are you?

Hi, Tom. I'm doing great. How about you?

Well, ...

Okay. I'll check with him, Dick.

Okay.
How do you read?

(I read you loud and clear. How me?)

Okay, I read you loud and clear. Tunnel 2 pressure check is okay.

(...)

(...)

We're heroes.

(Heroes, yes. ...)

(Kavkaz, this is Soyuz. How do you read?)

Yeah.

(Kavkaz, Kavkaz. How do you read? Over.)

It's a little over 5. A little over 5.

Apollo, Houston. Newfoundland for 7 minutes.

Roger.

(Kavkaz, how do you read?)

Apollo, Houston. AOS in Newfoundland for 2 minutes - for 7 minutes, excuse me.

Roger.

What do you want, Tom?

(Kavkaz, this is Soyuz. How do you read me? Over.)

And, Apollo, Houston. Just so we can keep our record straight, wonder we - if we could verify a couple of switches. One is on panel 161. Like to verify that the TV AMPLIFIER has been put to BYPASS.

That's verified, Dick. That's verified, Dick.
Okay. And the other one is - when we had data, which we don't have right now here at Newfoundland, it didn't look like we had started the - or - or got the WASTE STOWAGE VENT valve to VENT. So we'd like to just verify that those two callouts about 81 hours in the Flight Plan in the CP's column had got done.

Yeah, that's done. We have the QD attachment on the waste vent, and the ...

Okay, real fine. We'll be locking up on the ATS here very shortly. Sometime this evening, I've got a new block data pad for you. So, at your convenience, we need you - somebody gets out the Updates Book, I'll be glad to read it up.

Okay, maybe we can get it, as soon as we have ATS.

(Kavkaz, ... in simplex mode ... band but they aren't responding yet.)

Real good. Thank you, Dick.

Okay...

Okay.

... cue card. ...

Oh. Hold that for the UVA.

... what about ...? ... put those up ... Deke, go get the UVA cards out now.

You need to ... this ... is about all it says. Okay, ...

...
Yeah. We're supposed to go to bed in a couple of hours.

Vance, what have you got ...?

Does ... leave that ... zero?

I didn't. I thought you meant while ...

...

... leave on the ...?

...

...

... hell of a long time ...

... Well, what's ...

... Oh, man!

...

Here, Deke.

You know ... Deke, you got any idea what - Oh, I see. ...

Where's that Kleenex you were using? ...

Oop! ...

...

... that's ...

Apollo, Houston. Apollo, Houston. 1 minute until LOS; Goldstone at 82:57. See you there.
Apollo, Houston. Short pass at Goldstone for 2 minutes.

Apollo, Houston. Short pass at Goldstone for 2 minutes.

Houston, go ahead.

Tom, we got a real low elevation pass at Goldstone, just a couple of minutes here. We'll pick you up at Newfoundland in about 10 minutes from now.

Well, there's coffee in here but I'll be damned if I can see it.

All right.

Pardon me? ...

I think I could have ... it.

Tom -

Here it is.

We might as well drink some coffee. We'll probably have to ... 

What - what do you do - what do you think of getting the purge on.

# # #
00 18 03 ACDR Okay, ... that.
ACDR Where's the presleep ...? 1-49.

00 20 05 ACDR Cycle the H₂ FANS. Chlorinate the potable water. ...
ACDR Cycle H₂ FANS, Sl-8. Okay, ... Okay. ON sequentially at 1-second intervals for 1 minute, then OFF. H₂ FANS 1 and 2.
ACDR Okay. Clean CIRCUIT RETURN valve behind 382. ...

00 22 30 ACDR ... CABIN PRESSURE RELIEF valve ... NORMAL.
PRESSURE EQUALIZATION VALVE, CLOSED. DM TUNNEL VENT valve, DM/CM DELTA P. Now, the only thing is ...
00 23 25 ACDR Okay. That does it. I've already got ...
ACDR ...
ACDR All we need is to fix the ... Get this ... bracket ...
... film back in there ... Anybody else ...

00 25 16 ACDR ... furnace ... furnace ops, page 7-3.
ACDR Oh. Canister change. 9 into A and stow 7 in D-4.
ACDR That's all right. We can make them go. ... Okay. ...

00 28 07 ACDR "Say what?

00 28 20 ACDR You want to turn on the cabin fans? ... cabin fans ...
... CABIN FANS coming ON.
ACDR No. There's nothing here, it's ...
ACDR ...

00 31 11 ACDR Is that chlorine coming out? Can you tell, Vance?
Good God.
ACDR The whole thing leaked out?

00 31 52 ACDR All right. I don't think we ought to call the ground on it. ... we did have the ...

245
Hey, if I do this whole - the whole thing's going to ... ... makes it better, it'd be all right. ...

ACDR

... 

CMP

Yes, both ...

ACDR

...

Hey! PARTIAL PRESSURE's up ... Get it down ... It's up to 6 psi. Fuck! ... up. ... down.

ACDR

Is it down?

TIME SKIP

(Give it to us unformatted first, then 2, and then 14.)

USSR (53.)

USSR (Squares ...)

USSR (10.)

CC-M (... per format.)

SFE (***)gram - ... will be in format 2 because Alexey transmitted the 14th.)

SFE (***)gram 2.)

USSR (...)

(Current - please repeat the current and activation time.)

USSR (...)

CC-M (... 67th is 1651. And the seconds?)

CC-M (Roger. Copy.)

USSR (- of potassium.)

USSR (...)

246
USSR (Under ... monitoring.)

CC-M (We got everything. You don't have to give us an acknowledge.)

CC-M (... isn't necessary. We have format 3, also.)

SFE (... begun. Well, okay, we'll prepare it. We'll prepare it all.)

08 29 28 CC-H Apo -

TIME SKIP

09 41 51 CMP Yeah. I guess it does look a little out of focus.

SFE (Number 12 ... the 14th and the 13th also ...)

CMP Okay. How's the focus.

DMP Well, anyhow ...

ACDR ... turned on ...

CC-M (...)

SCDR (We opened the MPS valve ...)

CC-M (Right.)

SFE (The pressure is 620.)

09 43 16 CMP Yeah, we - we were kind of wondering why - what it would be like ...

CMP I think we'll have to give you some wakeup ... return sometime.

CC-M (Report your current pressure.)

DMP ...

CMP ...

09 44 40 SCDR (We have now collected all equipment to be returned and stowed in the container. There's quite a bit of it. After we've finished -)

247
CC-M (We'll report on the systems. That's okay, just ...)

09 45 59 CMP Yeah. ... 
DMP ... 
SFE (... 710.) 
ACDR (... ... the outside plane. 
SFE (... 780.) 
CMP (...) 
SFE (... 790.) 

09 47 38 CMP I think it's the - it's from the attitude of the ... because I don't know ... 
ACDR ... 
CC-M (I didn't copy you.) 
SCDR (The pressure is 780.) 
SCDR (... 790. At the hundred mark, it will go 800 - 795. The pressure is 800.) 
CC-M (... when you release pressure the valve will freeze, so about 100 millimeters from what you want, it should be moved, otherwise it could freeze and not close.) 
SCDR (The valve handle is now closed.) 
CC-M (... how much did you use up?) 
SCDR (Moscow, this is Soyuz. How do you read?) 
CC-M (Copied 00.) 
SCDR (Roger.) 
USSR (Okay.) 
CC-M (Go ahead.) 
SCDR (Transmit an example.)
CC-M  (... 51.)
SCDR  (... 44, 45.)

09 54 27  ACDR  ... , Deke, ...?

DMP  I'll give you that ... 
ACDR  ...

SCDR  (This sequence will be done from TA-1 (laughter) with TK-1.)
CC-M  (Which sequence is this?)

SCDR  (TV-14.1, operation per plan. TK-1 is on bracket TA-1. But there's no TK - oh, the continuation - Yes. Now it's clear, it's clear.)
CC-M  (Not TK-1, but TA-1.)
SCDR  (Correct, correct, we understand it all now.)
CC-M  (Fine. Thank you.)
SCDR  (We understand - not just TV-14.1 but also the continuation of TV-14.1.)
ACDR  ... better.

DMP  What?

09 56 55  ACDR  ... That docking has gone softer than ... docking. When they're docked - has gone softer ... The fact that ...

ACDR  Huh? Yeah. I was ... Why don't you go over there. I'm not cool over here yet.

CMP  Boy, I'm sure going back to the ... Huh?
ACDR  Whoever picked this attitude ...
CMP  They're just going for ...

09 58 23  ACDR  Oh, they're ... What about ... LiOH ...? 10 into B; stow 8 in D-4. 9 to A and 7 to D-4. ... 9 and 10.
ACDR  Huh?

DMP  ...

DMP  Yeah.

10 04 30  ACDR  Vance, you got a ...?

CMP  No.

ACDR  ...

CMP  ...

ACDR  ...

ACDR  ... the ground ...

CMP  I tell you, Tom, ...

ACDR  Better still, we'll give ... a call and ...

10 04 58  CMP  I - I don't think ...

ACDR  I don't either. ...

ACDR  ...

CMP  ...

ACDR  ...

CMP  Okay.

ACDR  ...

CMP  ...

ACDR  ...

10 06 57  CMP  Boy, we all better strap ...

ACDR  Oh, yeah. (Laughter)

ACDR  Okay. It says ... - enter the ..., right?

CMP  Yeah.

10 07 42  SCDR  Apollo, Soyuz. How do you read me?
CMP ... (Well.)
SCDR Tom, how do you read me?
CMP (Well.)
ACDR (Very well, Alexey. How do you read me?)
SCDR I read you loud and clear. How are you, Tom?
ACDR (Very well. We slept ...)

10 08 09 SCDR We slept well, too. Tom, we are getting ready for undocking.
ACDR (Very well.)
ACDR Okay. ... LiOH ...

10 17 52 CC-H ... the one that you end up installing on panel 11 to be put in MASTER, and the one that you take over to 871 to be in SLAVE. That's just changing the position on each of those cameras.

10 18 04 CMP Roger. Panel 11.
CC-H And I'll be saying good evening to you and talk to you in the morning.
ACDR ...

10 18 25 CC-H Morning, that is.
10 25 50 CMP ... Flight Plan.
10 26 47 CMP (Soyuz, this is Apollo.)
CMP Hey, Tom?
10 28 53 CMP' ... (Soyuz, this is Apollo.)
ACDR ... Yeah, ...
CMP ...?
ACDR Yeah, they ...
ACDR ...
DMP       ...?
ACDR      ... the last dock ...
ACDR      ...
10 32 40  CMP     Yeah.

TIME SKIP

11 00 33  DMP     See any ... buildup ...?
CMP       You know, thunderstorms look a lot closer to you. Yeah.
DMP       Oh, hey, Vance.
CMP       This one here? Okay?
DMP       ...
CMP       Yeah. That's what I said - that's what I said at first. That's one of my ...

11 01 07  DMP     ... me too ... I didn't see ...
CMP       Look at them. Are they pipes or are they mountain-tops?
DMP       They look like - look volcanic to me.
CMP       We're going to come up on Cairo in a minute.
CMP       I ...
CMP       Yeah.

11 02 06  CMP     Right. Time to what?
CMP       There you go. That all right?
CMP       Look at that country.
DMP       Beautiful.
DMP       Yeah. ...
There's Cairo.

Now here's the - here's the Red Sea right off to my left. Come right over ...

Unfortunately, Bo, we need about all we can get for visibility.

Boy, there's Cairo. Really --

There it is. Boy!

No problem.

Oh, great! ...

Yeah. We want everything we got.

Say, that stuff's pretty ... right there.

Yeah. See the pyramids?

Yeah! (Laughter)

My God! I think I did. I've got to get a map though.

Gosh, look at that! Look at that water. (Sneeze)

I know where we're supposed to be, but I'm not sure I - we're going too fast.

We're going to get a good view of the Levantine Rift here.

... we have a fantastic view of the -

Houston, look. We - we've got some fantastic viewing and picture taking of Africa right now.

No, we're in the Middle East right now.

I know.

Hey, that's Israel right down there. There's the - there's the Sea of Galilee. ... God damn - Boy, that's ...

Yeah.
Okay, I think we're ...

... 

Okay.

Now's the time to use the tape recorder ...

Yeah, we'll ...

... use the ...

... Baykonur.

Okay. ...

You got all the maps there.

No. ...

Yeah. I think you're supposed to have them.

...

... 66. Tom, you need to get the map out of ...

Yeah. We got to find out where we are real - fast and then see if we can get Baykonur. We're ... R-3 ... 

Okay. ...

Okay, we'll see if we ... around --

... 06.

Got to be exact about this. ...

I don't know, but they're obviously - getting to be ...

Yeah.

... like --

Yeah.
If it's half as good as ours, you ought to be having a ball.

Okay. Does that help?

Okay. I've blocked the number 1 window here with a map. Is that helping you some?

It should be around ...

Yeah. We've got to be going north of it.

Yeah.

I'm going to have to take it down periodically to get a view here.

Yeah, it's ...

Well, I'll ...

Tom, ... we'll get ...

Yeah.

Yeah.

That God damn caution and warning!

I don't know why we're getting that now. ...

Hey, could I get me one?

Let's see. I guess they want the windows ...
Why don't we just put it up ...

I'll put this one in this window, Vance. ...

I hate to do it to the better one.

... this window here now ...

I'll cover this one ... the cover ...

Tom?

Yeah.

Do you feel this is more ..., covered?

What?

I don't mean to --

They need us to ... plan ...

It did?

Oh, a little while ago.

This window, here, is the only one ...

They want this one ... out. Hell, I just put one up here with no problem.

Oh, yeah. ... that's ...

... won't bother you. It's only in window 1.

It's only window 1 and the hatch ...

I've got window 1 covered but it's ...

Hello, Houston; Apollo.

Roger. For a change, we thought we'd give you some wake-up music.

(Music: "Proud Mary")

Hey, wake up.
11 15 10  SCDR  (Apollo, this is Soyuz. How do you read me?)
DMP    Yeah, you probably drowned him out ...
ACDR   No, I turned off the FM.
DMP    Oh, okay.
SCDR   (Apollo, this is Soyuz. How do you read?)
ACDR   (Excellent. How me?)
SCDR   (I hear you poorly with a great deal of interference.)
ACDR   (Repeat please, Soyuz ...)
DMP    ... talking to Moscow ...
SCDR   How do you read me?
ACDR   Hey, Houston, we'll have the - and other good selections for you later on.
CC-H   ...

11 15 50  SCDR   Hey, Tom, we are now in orbital module. In 2 minutes, we are going to go to descent vehicle.
CMP    Houston, Apollo.
CC-M   (Moscow. Soyuz, how do you read me?)
SCDR   (I read you excellently. We are now in the orbital module, in our spacesuits. We are transferring into the DV.)
ACDR   ...
SCDR   (Onboard everything is normal. The pressure is excellent and everything is on schedule.)
ACDR   I turned off the FM ...
Houston, Apollo. Occasionally, we get some very good viewing because of attitude, weather, et cetera. We just now got a couple of visual observations, things that we haven't been able to get as well before. For example, saw the Levantine Rift and Egypt. I think might have seen the pyramids; that's an ... map that we have. And now I've got to see a picture or a layout of - of how the pyramids are laid out when we get back. But I saw two specks that might have been pyramids.

... was on the river, west - west of the river?

We think they're the pyramids of Egypt, and that happens to be a visual observation ... had.

(Will the PEV valve remain open or closed.)

It was on the west side of the river, west of Cairo?

Yes.

You want me to turn this off?

No. Don't touch it.

Right.

(... and repeat it again.)

Now's a good time to comment we haven't done much good work in that area so far due to a combination of cloud cover and time constraint.

(... the PEV cap.)

(Roger.)

(We've got some kind of loud noise.)

(Roger. We get that periodically.)

(... we didn't understand because of loud noises.)

(No. It's the OM electrical controls.)
Okay. We give them an undocking time at ...

(Soyuz, Apollo.)

(Moscow, Soyuz. We are transferring to the DV.)

Huh? Yeah, change places. Yeah.

Apollo, Soyuz. Apollo, this is Soyuz. How do you read me?

(Valeriy, I read you okay.)

Quite well.

(Good. The undocking time now is 95 hours 33 minutes 20 seconds GET.)

Thank you, Deke.

It does feel good to wrap those - wrap that ...

Yeah.

... 

Let's see, undocking time is 95:43.0, right?

... 

And, ... you got a P52 option 3 coming up ...

95:10. 6 or 7 minutes. You have plenty of time ...

Yeah. I feel a hell of a lot better. ... pulled out more for you?

(... this is Soyuz 2. I'm in the DV.)

(...)
<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 27 38</td>
<td>ACDR</td>
<td>Okay. We've got the clock counting up.</td>
</tr>
<tr>
<td></td>
<td>DMP</td>
<td>(Moan)</td>
</tr>
<tr>
<td></td>
<td>ACDR</td>
<td>Okay. We're going to undock at 43. So, 20 minutes before that.</td>
</tr>
<tr>
<td></td>
<td>DMP</td>
<td>Okay. ...</td>
</tr>
<tr>
<td></td>
<td>ACDR</td>
<td>Say, 95:23.</td>
</tr>
<tr>
<td>11 28 04</td>
<td>DMP</td>
<td>Okay. ... ...</td>
</tr>
<tr>
<td>11 29 03</td>
<td>DMP</td>
<td>Okay. PRO, PRO. Do not activate.</td>
</tr>
<tr>
<td>11 29 18</td>
<td>CMP</td>
<td>Yeah.</td>
</tr>
<tr>
<td>11 29 20</td>
<td>DMP</td>
<td>Okay. G&amp;N POWER - OPTICS POWER, on ... P52 option 3.</td>
</tr>
<tr>
<td></td>
<td>ACDR</td>
<td>... ENTER, VERB 46.</td>
</tr>
<tr>
<td></td>
<td>DMP</td>
<td>Huh? We PRO, PROed and everything.</td>
</tr>
<tr>
<td></td>
<td>ACDR</td>
<td>Okay. Okay. Just leave it like that. Go back to POO.</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>You say POO?</td>
</tr>
<tr>
<td></td>
<td>ACDR</td>
<td>Yeah. ... back to POO. ... Reset to POO. And then we can go back to - hold it.</td>
</tr>
<tr>
<td>11 29 57</td>
<td>ACDR</td>
<td>... , when we torque, will POO wipe out that P and P? Will POO wipe out that P and P? POO's okay.</td>
</tr>
<tr>
<td></td>
<td>DMP</td>
<td>... supposed to torque ...?</td>
</tr>
</tbody>
</table>
Yeah. ...  
Okay. But I can't see ...  
Go back to 37.  
VERB 37 ENTER?  
Yeah. Again, the POO does not wipe out that P and P. Go back to VERB 37 ENTER zero-zero.  
Okay. VERB 37, ...  
Well, that fucking O\textsubscript{2} HIGH FLOW ...  
Okay. Now, ...  
Okay. G\&N OPTICS POWER, on; P52. Says 35, 36, and 40 are the stars. ... You've already done that.  
... to get the DET counting.  
... do that. Okay, what time is it?  
Okay. 95 --  
... make it 20. So say 12:20 - 12:43, make 31. Take it to 29 and we'll ...  
Okay. 3, 2, 1 -  
MARK it. Push hard. (Laughter) ...  
...  
...?  
... Wish that thing had decent lights.  
Oh. Well - we had, you know, luminescent lights on the docking - the old lunar module type.  
Yeah.  
Man, that was something. ... spotlight again, Deke.
ACDR Huh?

DMP All right. One, two - one, two, three, four. Okay ... Deke. Noun 89 or ...

DMP 89. Okay.

ACDR Yeah.

DMP Okay. What next?

ACDR VERB 49.

DMP 49? Okay.

ACDR 95:14:15. Okay, why don't we deactivate the primary evaporator? ...

ACDR Okay, now that you got that, we can realine the GDC to the IMU.

ACDR Is Myrtle off?

ACDR Myrtle.

ACDR Has that got - Have we got the ... bag on?

ACDR Have we got - we got - we do have that - we do have that, Vance. If the waste stowage vent is closed, it'll help ... Is it closed? We got that - we got that elbow on it. It's supposed to clear out. No problem. Okay, there. We're ready in a little bit to command OPTICS ZERO, ZERO; G&N POWER, OFF - OPTICS, OFF.

CMP Deke? Do you verify CMC in AUTO?

DMP CMC in AUTO.

DMP Okay. We go back to ...
ACDR  Okay, I'm about ready for undocking to begin. Oh. Come on ... CMC.

11 36 50 ACDR  (Soyuz, Apollo. Over.)

SCDR  -- ... Tom.

ACDR  (Ours also. Please, excuse me. And how is your radio range?)

SCDR  Okay. Ranging on, Tom.

ACDR  (Thank you.)

11 37 12 DMP  I don't know; couple of them in the boxes. There's a couple of them in the boxes. I don't know.

11 37 16 ACDR  VHF AM, off, center; B to DUPLEX.

11 37 22 ACDR  ANTENNA, RIGHT, verify; on the VHF gain over there.

DMP  I didn't see it, Tom, but a couple of them the other day was in the boxes.

11 37 35 ACDR  What's your DET reading, Deke?

11 37 39 DMP  34:12. Okay. ... You know - Getting dark yet?

11 37 55 ACDR  Okay, go back to POO. Let's give them a mark at ... and 24. (Soyuz this is Apollo; 5 minutes to sync of clocks. Over.)

SCDR  Roger. We have 5 minutes before sync the last time.

ACDR  Okay. ...

DMP  ...

ACDR  Yeah.

DMP  (Yawn)

CMP  Okay, that's -

CMP  We got everything configured.

ACDR  We got it configured ...
CMP Yeah. ... zeroed in.

CMP ...

ACDR ...

CMP Now, I wonder where my other tape recorder is - I wonder if it's in the same place.

ACDR Could be.

CMP Oh. Okay. Hey, why don't you grab the ...

ACDR I don't know about you guys, but I'm hot.

CMP ...

ACDR Yeah. ...

CMP ...

USA (Music)

CMP Yeah.

ACDR Who played this ...

CMP We'll have to try the girls' showers --

ACDR Yeah.

CMP -- ... week.

ACDR Yeah, yeah. Girls' showers. (Laughter)

CMP We ought to do that while we're still docked.

ACDR Oh, hell yes!

CMP Yeah, why don't we ... Saturday? ...

ACDR (laughter)

USA (Music)

CMP Okay.

ACDR Okay, we're going to ...
DMP ... coming up. ... 20.

ACDR Okay.

DMP How did you ...?

11 42 51 ACDR Why don't you do it? I don't like the dumb thing. (Laughter) I've got one here that says it'll be at 43:20.

DMP Yeah. 23:20.

ACDR 23:20, right.

DMP Okay.

ACDR Yeah. (Soyuz, Apollo. Ready?)

SCDR Okay, ready.

ACDR (Okay. 3, 2, 1 -)

11 43 25 ACDR MARK.

SCDR (...)

ACDR (Laughter)

ACDR (...)

SFE (...)

DMP (Laughter)

CMP ... it's my turn.

SFE (You're a genius.)

CMP ... 

DMP (Laughter)

ACDR ...

CMP ...

ACDR ...
Okay. You want to hear about what you don't do with this translation...?

No, I don't want to know; Bo might, though.

Okay.

... translator?

Yeah.

Okay.

Hell, they're off.

Oh, I see. Okay. The pump's off. Every - The evaporators are off now, Bo. Yeah. We had the EVAP, OFF ***

Okay. There we go. Okay. I'm going to turn - active undocking.

Okay. We have to ... Soyuz. ...

...?

Yeah.

It says here ... Okay, Deke, ...

Yeah.

Okay. Push the ... coming in.

Okay. It's locked, Deke.

Okay, back to the right.

All systems ... it says here. ...

Okay.

Deke, degrade systems. ...

Yeah.

Okay. ...
SERVICE MODULE RCS QUAD ... OFF. ...

... I'll tell you.

We got it at a ...

... check that DAP?

All right.

Set for llll?

... five l's, 146, ...

Yeah.

5 NOUN [sic], push.

Yeah. ... activate the ... ... activate ...
Right here. ...

Yeah. ...

When you activate ... right in ...

Deactivate the evaporator. Here let me get ...

High-gain angles are MANUAL, WIDE; pitch, minus 18 -

Well, any time you get to take the -

Pitch is minus 18 and yaw 220.
CMP Right there; right ...

11 55 34 ACDR ... 61102. ... ... and all that.
CMP It better ... ... you get ...
ACDR ...
CMP Yeah. Well, I was - ...
ACDR ... anywhere. ... Okay. Let me ...
CMP Yeah.
ACDR ...
CMP Tom?
ACDR Yeah.
CMP ... a little difference between 26 000 and 4000.
ACDR Okay. ... Yeah. ...
CMP Yeah.
ACDR ...

11 56 40 ACDR Okay. I got high-gain set. Active undocking ...
Okay. GUIDE RING CAPTURE light ... 55 go to the active undocking ...

DMP ...
ACDR ...
CMP ... TSB over there.
CMP Right here.
ACDR Where? Over here?
CMP Yeah.
ACDR Got the Nikon in here?
DMP ...
... How about the Hasselblad?
(Cough) Nikon, stay down here.
Okay. ...
... Tom, ...
Yeah.
...
...
(...)

11 58 43 Okay. ...
ACDR Okay. We're going - we're going to A,
MAIN BUS ...

Ready to go into ...
...
...
...
...
...
...
...
...
Yeah. We got to watch this ...

11 59 08 Apollo, we are opening active hooks.
SFE ...

... All we have is ..., right?
...

11 59 26 ... I don't understand you Tom.
SFE ...

(We have opened the active hooks.)
SFE Okay. Open active hooks

11 59 37 Okay; 56. AUTO RCS SELECT, twelve. MNA; B/D ROLL
ACDR is OFF; all of them - is OFF.
11 59 49 DMP Okay. I'm supposed to do a VERB 46.

11 59 56 ACDR VERB 16 NOUN 04 ENTER; SPACECRAFT CONTROL CMC in FREE ...

DMP ...

USSR Tom, interface seal compressed off.

12 00 09 ACDR (Roger, Roger.) Okay. RHC, trim R2 and R3, pitch and yaw to 0, fly from errors.

12 00 21 CMP ROLL, OFF.

ACDR B/D ROLL, OFF. Thank you. All of the twelve, OFF.

CMP Okay, now.

ACDR Okay.

CMP We should --

ACDR ...

CMP Yeah. Okay, it's ...

ACDR ...

DMP That yaw there? That's roll, pitch, yaw ...

ACDR Yeah. Yaw's started.

CMP Yeah. Got a good yaw.

ACDR ... I can feel is ... roll. Boy, ...

CMP ...

ACDR Huh? Oh.

CMP ...

DMP ... great yaw.

ACDR ...

12 01 24 DMP Great big yaw.
Yeah.

ACDR
CMF
ACDR
Soyuz.

12 01 39  ACDR  (Soyuz, this is Apollo. Ready. How do you read?)
SCDR  We are ready for undocking, Tom.
ACDR  (Roger.) ... coming up at 59. Okay. All your ...

12 01 59  ACDR  BMAG MODE, three, ATT 1/RATE 2; SPACECRAFT CONTROL, SCS; do not control roll attitude; EMS MODE, NORMAL.

12 02 12  ACDR  SCS. EMS, NORMAL. --
SCDR  ...

12 02 35  DMP  ...

12 02 38  ACDR  Yeah. ... VTR HEAD WHEEL MOTOR DRIVE, ON.

12 02 42  CMP  Okay. ... --

12 02 43  ACDR  VTR TAPE, RECORD; DAC on.

12 02 48  CMP  Okay.

ACDR  We'll quickly count down to it. You got 15 seconds to go.

271
Stand by to CAPTURE LATCH B. Stand by.
Okay.
We are standing by.
About 20 seconds ...
Okay, 20 seconds.
Ready.
You got ...?
...
Yeah. Okay.
...
Stand by.
Okay, it's 5 to go.
(Ready for undocking 5, 4, 3, 2, 1)
MARK.
We have undocked.
(Undocking.)
Okay. We got about four in there.
Okay. CAP --
...
-- seconds to go minus X for 3.
Okay, Tom. What's next?
Okay. Okay, CAPTURE lights A and B, out and LATCH to down.
Capture LATCH A and B, I did it. ... down, ...
ACDR: All right. At 15, we're supposed to thrust to ...
DMP: Are we ...?
CMP: At 30, we go minus X for ...

12 03 56 CMP: Now.
ACDR: Okay.
DMP: Okay.
ACDR: We could have checked that.
CMP: Okay.

12 04 11 ACDR: Okay, then, at 3 minutes, we go DSE, LOW BIT RATE.
CMP: Got about a 1-degree error. ... line that up on that --
ACDR: ...
CMP: I don't know what it was when it shut off, there.
DMP: ...
CMP: In?
DMP: In.
ACDR: No. I got it.
DMP: ...
ACDR: ...
DMP: ...

12 05 08 ACDR: Okay. Let's go for 3 minutes. ...
DMP: ...
ACDR: 3 minutes. ...
DMP: ...
I'm looking for ... ...

(Soyuz, this is Apollo ...)

Roger.

... 3 minutes ... MAN ATT, RATE COMMAND ...

-- LOW BIT RATE; DAC, off; MANUAL ATTITUDE - DAC, off, Deke?

... 

MANUAL ATTITUDE, three, RATE COMMAND; AUTO RCS, sixteen, MAIN A and B.

They're all on.

... 

Got it.

Okay. Let's go to -

... roll or not?

No.

You eventually have to.

Eventually you have to.

Because you got to go up and dock with it.

Yeah.

It's easier if you do.

Let's see, I guess our shadow's off of them now.
I

DMP

CMP

where it came off.

ACDR

Okay, Deke. Stand by. Plus-X for 16 seconds.
Okay -

12 07 22 ACDR

MARK it.

ACDR

Okay, 8 seconds gone, 10 seconds, 13, 14, 15 -

12 07 37 ACDR


CMP

... docking. ...

ACDR

(Soyuz, this is Apollo. We have the Apollo station-
keeping now.)

SCDR

Roger. Apollo stationkeeping. What is the range?

DMP

... we're not either, Tom.

ACDR

(50 meters.)

SCDR

Roger.

12 08 14 ACDR

Roger. We've undocked and stationkeeping.

ACDR

Everything was on time, Bo.

CC-H

... AVERAGE ...

12 08 35 ACDR

It's in AVERAGE, Bo.

CC-H

Thank you.

ACDR

Hasselblad ...

SCDR

Soyuz orientation lights on.

ACDR

(Roger.) They told me this morning, remember I
ask ... but I ask them what setting ... 4[00] and
500.

CMP

Roger.

12 09 03 ACDR

You got PEAK, Bo.

275
... docking.

Bo, it's in UP TELEMETRY. Yeah, that's right. When I couldn't see that fucking docking. ... undocking ... That's right.

How's your picture on the tube, Bo?

Oh, yeah.

Okay, let me go ahead and ... them.

Okay. ... Deke. ... orientation. Right after that we can - we can ...

You have beacons on?

No. ...

...

Okay. We're going to ...

It ... work ...

Yeah. I told him to turn it on.

... to get that in.

Okay. ... --

... go ahead ... --

Okay. PRIMARY EVAPORATOR activation. GLYCOL $H_2O$ FLOW, AUTO, and STEAM PRESS to AUTO.

I don't think you have to worry about it. ... attitude, right?

No, no.

... 

That's right.

Yeah.
ACDR ... 

CMP Yeah.

ACDR ...

CMP ... Yeah.

SCDR What is range now, Tom?

12 11 24 ACDR (About 50 meters.)

SCDR We are now 30 meters.

ACDR (50, 50.)

SCDR ..., Tom.

ACDR Say again, Bo. Keep that ...

12 11 57 SCDR What is the range now?

ACDR (...)

DMP ... No, wait a minute ...

12 12 12 SCDR What is rate now?

ACDR ...

SCDR We are now - Apollo-keeping [sic] - stationkeeping.

SCDR 50 meters.

SCDR I'm ready.

ACDR Okay, now. ... attitude. ... you got AVERAGE.

12 12 40 SCDR Soyuz ready for orientation.

ACDR (...)

ACDR Yeah, that's right. ... Okay. Okay. Let's --

DMP ...

ACDR Okay. Let's - we're all right. Okay. Grab a couple of pictures of ...
DMP ... got any more of the film.
ACDR Not yet. ... (...)

**12 13 25**
CMP ... right.
ACDR ... F/4 on the 500 ...
CMP F/4 on the 500?
ACDR Yeah, that's ... That's what the ground told me.
CMP That's the ... after that.
CMP I haven't --
ACDR ... F/4.

**SFE**
Initiating orientation.

**12 13 48**
CMP (Ready ...) ...
CMP Okay. ... I -- I got it down ... 500. ...
ACDR 500. F/4 500. What about the Hasselblad? ...?

**DMP**
...
ACDR Okay. Vance, ...
DMP Okay.
ACDR ... Set DET counting up to 96:08 ... At 55 it'll be 13 -- that'll make it 47 - 13 ... 47.

**DMP**
...
ACDR What, the DAC?
DMP Yeah.

**12 14 41**
ACDR ...teen ... trying to make another ...
ACDR ... Okay. Go ahead.
ACDR 3, 2, 1 --

**12 14 58**
ACDR MARK. Counting up. Okay, that's 96:08, 47 and counting.
Okay.

Okay. VERB 25 NOUN 22 ENTER.

Okay. Plus 197 (cough) 00.

... 014 ...

Deke get me that ...

Okay. Deke has the same problem I have. The COAS is completely washed out. It's full up, it's so bright out.

We can look and ballpark it; it's about 50 meters, plus or minus 1 or 2.

Hey, look at them ...

Going off?

Don't know.

Deke?

Yeah.

Maybe it --

Oh, that's ...

... Hey, Deke? What about ...

No, I don't. ...

(Laughter)

No, I -- I paid for them too.

Deke's got more than 50.

...

Think I got ...

No, that's ... Yeah, the Hasselblad was ... Let me try that upside down. Try that upside down.
Okay.

Passive docking checklist. Okay, Deke. Ready to go on this?

Okay, Deke. Ready to go on this?

Yeah. ...

All right.

Tom, you got the ...

I got - I got the ...

...

Let me have the ...

... You didn't have --

Yeah.

-- ...

(...)

Yeah. ... Better get your COAS ..., Deke.

Well, I considered ...

It was damn good and light out ...

... COAS ... eyeball it. That COAS is ...

Well, I ... --

... docked and coming up ... You ... alined?

Yeah.

All right. Let me know when you're lined up. Line up on ...

I got the ... alined ...

I think ...

I am ...
CAM \hspace{1cm} \textbf{Give me the docking angles again.}

ACDR \hspace{1cm} \ldots let me check those angles. Stand by. \textit{We're real busy. Okay. 197 --}

CAM \hspace{1cm} Yeah.

ACDR \hspace{1cm} -- 205 --

CAM \hspace{1cm} Yeah.

ACDR \hspace{1cm} -- 01\frac{1}{4}.

CAM \hspace{1cm} 14 degrees.

ACDR \hspace{1cm} 14 degrees, 197, 205.

CAM \hspace{1cm} Okay. ...\hspace{1cm} \ldots 014.

ACDR \hspace{1cm} That's all I got.

CAM \hspace{1cm} ...\hspace{1cm} \ldots I think I can line up on the ...

ACDR \hspace{1cm} Just line up - line up on the ...

CAM \hspace{1cm} ... I think I can line up on the --

ACDR \hspace{1cm} Line up on --

\hspace{1cm} 12 22 23 \hspace{1cm} \textbf{CMP} \hspace{1cm} I think this attitude ... off.

ACDR \hspace{1cm} ... me off.

CAM \hspace{1cm} Deke.

DM \hspace{1cm} Yeah.

CAM \hspace{1cm} ... off.

CAM \hspace{1cm} ... it's off.

CAM \hspace{1cm} Where we at in the ...?

ACDR \hspace{1cm} ... You've got 1/2 GAMMA, Bo.

CC-H \hspace{1cm} Thank you.

281
And, Bo, we think maybe his docking attitude isn't exactly what we've got on the pad.

No, it's not.

We know it's not, Bo.

Roll looks good. Pitch and yaw are a little off.

Okay. Take the mags ... out.

Tom, APDS mode accomplished.

(Say again, please.)

APDS mode accomplished.

(Roger. Roger. Understand you.)

I'll give you our docking attitude as soon as we have it refined here.

... 

Everything is ready.

... 

Well, that's everything.

Okay. ... 

Yeah. Just so it'll guide right ...

Yeah.

Either your right ... or I'll take a ... Right ... you got a good attitude.

Yeah. ... looks good.

Okay.

...
Okay, Bo. We're pretty close. The docking attitude is 195.7, 208.1, and 21 degrees point 3.

Okay. Let's put ...

Deke has ...

Huh?

Okay. ... lined up on the ATS.

Yeah.

(Soyuz, this is Apollo. Orientation established. Ready for docking.)

Okay.

(Roger.)

We are ready. Go ahead, Tom.

Roger, Alexey. (Understand.) All right. I think they're ready to do it.

Yeah, but we got to --

Okay, here they go.

-- NORMAL.

Okay. Got the DAC on; EMS MODE, NORMAL.

... DAC on.

Okay. It says thrust, thrust plus X for ... seconds.

4 jets.

4 jets, yeah.

Not 4 jets. ... jets ...

... DAC ... out.

Okay. Why don't you get the DAC film ...
Can't make it in here.

Well, whenever you run out.
... can't make it ...

... is okay. You're supposed to be starting way out there ... when ...

... you go ahead.

Okay. Let's try that.

Let's get ...

... I got ...

... you up on it ...

... washed out.

... they're all up there. Okay. I'm going to give them a call.

...?

Yeah. (Soyuz, I am now approaching Soyuz. We are ready.)

I don't understand you. Repeat it, Tom.

This where you want ...

Yeah. (I'm approaching Soyuz.)

Okay. Keep coming, Tom.

... COAS ...

All right. All right. All right, line up - line up his target, Deke. Look at the target. Line that up and put that ...

Hey, Deke --

... go ahead --
ACDR   -- look for ... --
DMP     -- ...
CMP     ... everything else, the bottom's right.
ACDR    ... film ...
DMP     ...  
ACDR    ...
ACDR    Deke.
DMP     Yeah.
ACDR    Line up just ... Half of ... That's about right ... COAS.
DMP     ... bright light for ...
ACDR    Line up the ...
DMP     ... 
ACDR    ...
DMP     ...
ACDR    Ready. ... 

12 28 50 ACDR Okay, Houston. Deke's having the same problem with COAS washout that I had.
DMP The COAS is ...
CMP Yeah.
DMP ... absolutely zero COAS.
ACDR  (Distance 30 meters.)
DMP ... 
ACDR Vance, see ...
DMP ...
ACDR  ... that panel, that ... panel ...  

CMP  Yeah. Looks to me like it's a pretty good guess as to what ...  

DMP  Yeah.  

ACDR  ... get that - get ... light ...  

DMP  ...  

ACDR  Aw, you're all right.  

CMP  We got confidence.  

ACDR  We got confidence in you.  

CMP  ...  

DMP  ... Have any problems ...  

CMP  Well, that's bet - that's better.  

ACDR  ...  

CMP  No. I don't know what setting you're on.  

ACDR  I tell you, ...  

12 30 23 CMP  (Distance 30 meters.)  

DMP  I don't know ... Yeah, ...  

DMP  ...  

ACDR  Okay. Now I can - I can see his ... now real good, Deke. Vance, slow it up a little bit.  

CMP  Yes, I can ... that.  

ACDR  ... out here in ...  

CMP  ... Okay; I'll watch ...  

286
Okay. Struts?

Okay. ...

Every - everything is done.

Okay. It's been done. As soon as we dock, what then?

Soon as we dock - Okay, I'll tell you. Oh shoot! It's not ...

...

dock, contact, plus X ... for 5 seconds. MAN ATTITUDE, MIN IMPULSE.

That's right.

We confirm ...

(...)

Okay, Deke, coming on his ...

Oh, shit.

50 meters.

... pole. See, he pitched down and ... the Earth.

Let's go ...

I didn't hear you, Tom.

Okay. This COAS isn't going to be worth a ...

Yeah, well you're going awfully slow.

You're going awful slow, Deke.

From my position we're getting close. I can't tell you about that target because of my angle.
Yeah.

ACDR You've got good enough - you're in good enough position for a capture right now.

Yeah.

ACDR Vance, you ... left and right.

Yeah. I'm in good shape ... right now. He can see that pretty well when ... turning around. ... a little bit low.

You're going up.

Still ... a little high ... No, no I'm not.

No you're not, are you?

Let Deke do the ...

I don't want ... Right.

Close your rate; slow her down. ...

There you go.

If we get in the way. ...

Damn sure.

Okay. I'm watching the light. ... your right hand. ... I'm looking for the ...

... Yeah. I'm looking for the light. Maybe slow it a little bit.

Okay. You want to watch for the light.

I'm watching for the light. Stand by. ...

Stand by. ...

Capture.
12 33 45  ACDR  (...)  
USSR  (...)  
12 33 49  ACDR  Yeah, that's got it. Got it.  
CMP  Okay. ... Go ...  
ACDR  Okay. MIN IMPULSE.  

12 33 51  CMP  MIN IMPULSE. I got it. Beautiful!  
DMP  Couldn't have been lined up any better.  
ACDR  That's okay. ... That's okay. Just ... He scared the shit out of me too. That's all right. He's got some real weird dynamics. He's got some weird fucking dynamics.  
CMP  Yeah.  
ACDR  Just let it go.  
CMP  Yeah. That whole docking --  
ACDR  Oh, fuck! Do you see him? Watch him ...  
DMP  What you can do on that - that ... during the docking period. ... that COAS. ...  
ACDR  You better believe it is.  
MS  Okay, now.  
ACDR  Okay. We have --  
CMP  All right.  

12 34 30  ACDR  Okay. We got the lights just exactly as we're supposed to have them.  
CMP  That's right.  
DMP  Yeah. Don't forget the ... here.  

289
Apollo. This is Soyuz. ... initiating retraction.

Okay. That - Okay.

Let's - I have to get ...

...

All right. I'll be ...

All right. It's not hurting anything.

Not hurting anything. You're at MIN IMPULSE.

... at MIN IMPULSE.

You're at MIN IMPULSE. Not hurting a thing.

Okay. Deke, suppose I ... retraction ...

All stable now.

Okay. MANUAL ATTITUDE, three, MIN IMPULSE, which you got. AUTO RCS --

No, I don't have. I don't have.

Didn't you go to MIN IMPULSE?

No. No.

MANUAL ATTITUDE, three, MIN IMPULSE?

No. I can't worry about ...

You were CMC in FREE ... MIN IMPULSE.

Okay. ...

It stopped. No. By God, it is yawing.

Going into gimbal that was causing it.
Yeah. I'd try the hand controller.

... what I'd try.

... 

Hey, your CMC in FREE ought to be AUTO.


Okay. ... 

Pitch down.

... yawing.

Now, try to get back over here ... Yeah, ... catch up with you.

Okay.

...

What the hell happened?

...

Yeah.

...

Yeah, I'm pitching full up.

...

What the hell happened? We got some weird --

...

I don't know. It could have been from the docking there ... 

Watch the way - his dynamics were going back and forth.

Okay.
ACDR AUTO RCS SELECT. Okay, these - these numbers are OFF. A3 --

12 35 30 CMP They're OFF, huh?

ACDR That's --

CMP That's hand control.

12 35 33 ACDR I'm sorry. Shit. CMC in FREE.

CMP ..., Deke. Put these back in AUTO because I don't think that we got ... Okay?

DMP Okay.

ACDR CM - You got FREE, got that?

12 35 48 DMP Yeah. CMC, FREE.

ACDR All right. Okay. A3?

ACDR Okay. You have the jets off. A3?

12 35 53 CMP A3's coming OFF.

ACDR C4.

12 35 55 CMP C4.

ACDR B3. Quick.

12 35 56 CMP Yeah.

ACDR D4.

12 35 58 CMP Okay. Go to CMC, AUTO, real quick. ... gimbal mode.

DMP I know. That's what I'm worried about, here. ... get that son of a bitch.

12 36 08 DMP DAC going off.

CMP Let's see. Have we got everything? We got all of the thrusters.

DMP ... I think it's still yawing.
Okay. We still got some cleanup here.

Yeah. After he tells us passive docked configuration, we'll have everything else done, right?

Okay.

Guess.

The final passive docking configuration. Everything else is done.

Okay. My hand controller should still be armed?

Well --

I'd leave it armed --

THC?

-- but not turn on the THC and --

Yeah, I'm going to turn that off.

I'd turn off that and leave the hand controller armed, so that you could get it in a hurry if you --

Okay. Let's go. P00.

We're in P00.

Okay. We were getting into gimbal out there, Bo, for some reason. So we had to manually crank it out of there. ... in some weird attitude right now.

Okay. VERB 44 ENTER.

Load 87, 1111, 00146, all balls.

Okay.

Next one, 05000, 00050.

Okay.

Okay. VERB 45 ENTER. Activate the docked DAP.

Okay.
ACDR  RHC 2, LOCKED. That's your choice.
DMP  ... lock it now ... 
ACDR  THC, locked.

12 39 04  CMP  Yeah.
ACDR  EMS FUNCTION/MODE, OFF/STANDBY.
DMP  Okay. That's the kind of stuff that helps.
ACDR  MANUAL ATTITUDE ROLL, MIN IMPULSE.

12 39 14  DMP  ROLL, MIN IMPULSE.
CMP  PITCH and YAW, RATE COMMAND.

12 39 17  DMP  Yeah.
ACDR  LIMIT CYCLE, OFF.

12 39 20  DMP  OFF.
ACDR  DEADBAND RATE, MIN and HIGH.

12 39 24  DMP  Okay. DEAD - RATE - HIGH.
ACDR  THC POWER, OFF.

12 39 28  DMP  POWER, OFF.

12 39 29  ACD R  RHC POWER in NORMAL number 2, OFF. RHC POWER DIRECT 2, OFF. EMAG MODE, three, RATE 2. MAIN BUS TIE, OFF. They're coming OFF.

12 39 44  ACD R  AUTO RCS ROLL SELECT, A/C ROLL, we got four MNA; and B/D ROLL, four, MNB.
CMP  Deke.
ACDR  Yeah.

CMP  Give me those again? A/C ROLLS all up to A and B/D ROLLS all up; and I think he's going to have to turn OFF --

DMP  B/D ROLLS are all in A --?
CMP  Yeah.
DMP  B/Ds are all what?
CMF  A.

12 40 07 DMP  All A. ...
CMP  Yeah. ...
ACDR COAS POWER, OFF.

CMP  How about PITCH and YAW, Tom? You want those ... docked DAP.
ACDR  Okay, now, what I called --
SFE  Apollo, Soyuz ... 
ACDR  Okay. It says AUTO RCS SELECT --
ACDR  That's all it says --
SFE  Apollo, this is Soyuz.
ACDR  ...
CMP  Okay ... --

12 40 36 SFE  Interface seal compressed.
ACDR  Okay. Roger. Understand you.
SFE  APD - APDS mode accomplished.
CMP  We got our ring lights there now?

12 40 48 ACDR  Yeah. Everything's squared away.
CMP  Light --
ACDR  That STRUCTURE RING CONTACT light ...?
ACDR  ...

12 41 04 CMP  Okay. You're going to disable them --
I wonder if that ... maneuver ... docking attitude -
docked attitude.

I don't know. ... another attitude.

Yeah.

Okay. Yeah, I got that ... degrees ...

Well, good show, Deke. Do you have any trouble at
it at all?

No. ...

... Being - being in an inertial attitude like that ... ?

... pretty good ... that black background there ...
came out ... blend right into the black, though. ...

Yeah. We're burning up in here, Bo.

It's a little hot with all the cameras on.

... Well, when we went to the - when we went to the docked
attitude, that's - that's the attitude; go back to
that.

All right ... go back to that ...

Yeah, it's docked ...

I'd guess ... vacuum.

... We'd better do that, I think. ...

...

Looks like we're supposed to be in a docked attitude.

I don't know. You want to ask, Deke, ... and see what
they say?
DMP: Houston, Apollo.

DMP: Yeah, we're in some random attitude here, due to getting into that gimbal lock situation. And we're debating whether to maneuver back to the docked attitude or leave things go. What's your recommendation.

DMP: Okay.

ACDR: I can go and get that hatch, yeah. ...

ACDR: Yeah. Whoops!

ACDR: Well, let's see - Yeah, it's going to be ... on ... Yeah. Oh, by the way, you won't have to ..., you know. ...

CMP: Yeah. ...

CMP: Okay. Roger. ...

ACDR: ...

DMP: I'll be all right.

12 45 19 SCDR: (Moscow, Soyuz. Do you read me?)

CMP: You think he's had too much to drink? (Laughter)

M-MCC: (Read you loud and clear. How do you read me?)

SCDR: (Everything is nominal. We had an integrity check. 3 minutes passed, the pressure has not changed; that is, it varies in normal limits. For the last 3 days, we have such trouble - When we are flying over the Soviet Union territory, they begin to transmit the weather reports from the airports ... We get all of it. As soon as ... docking and undocking, the noise starts.)

ACDR: ...

SCDR: (...)

DMP: You haven't heard from Alexey yet, Tom?

ACDR: Oh, it's too early ...
Okay, the three power switches are off. ...

I'm going ahead - I'm going up - I'm going to go up and get that hatch out.

Yeah, I think you ... Yeah, it looks like --

No. No, I don't ... Yeah.

...

Yeah. You're right, Tom. Yeah.

Well, I guess ... dock because it's late. Looks like we've been stood up.

(...)

...

(There is nothing besides audio equipment. This is the third day that the magnet is being overheated. The landing course is 194 degrees, the temperature is 27 degrees, humidity 43. That's what is constantly being transmitted. ... SIMPLEX and VHF. We have SIMPLEX AM and dual VHF on.)

All righty. (...)

...

Start it, Deke.

Yeah.

... huh?

It's supposed to be ...

I'll tell you one thing ...

...
Yeah. It looks like...

Going over Russia?

Yeah, probably...

I wonder if that's that...

...(Come on, speak.)

We'll just leave that hatch...

Yeah, well--

(... Orroral from 12:43 to 12:49)

Take down the hatch, Deke. ...

Okay; will do it...

That's right. Put it down and hold the hatch down.

Okay.

...(Orroral from 12:43 to 12:49)

All right.

I guess we can probably get that damn black bag out.

Yeah.

...(Orroral from 12:43 to 12:49)

That is a good idea.

May be...

... Get that black bag up in the docking module.
That's a good idea. ...

Why don't we ...

Tom, we want to get a reading after undocking. ...

...

Oh.

Soyuz, Apollo.

Go ahead.

(Alexey, ...)

I don't understand you, Deke.

(...)

Go ahead. Okay.

Put that black bag up there, too, will you.

... I turned on the mixing. ... I'm going to turn on that fan up here, too.

Whew! That's warm.

Yeah, sure wish we could --

Looking back, I wonder if we got information on it?

No, it didn't.

... I don't know, I feel like maybe ... trouble on this thing.

I'm going back ...

Okay, --

I'll take a ...

... a little earlier.
ACDR  Vance?
CMP  Yeah.
ACDR  ... pitch ...
CMP  Eight, what?
ACDR  Yaw.

12 52 35  CMP  Yaw. Okay, that's the ...
12 52 42  ACDR  ... on the way out.
13 05 52  CMP  We got one whale of a reading.
      ACDR  Roger. And, Bo, again, you wanted the helium in­ject at this time, right, at 96:40?
      ACDR  Okay. That's page 7-3 in the DM Checklist.
      ACDR  Okay. Roger. 7-5; 7-5; 7-5; 7-5.
13 06 40  ACDR  Glad he got that - glad he went ahead and got that out of there on time.
      ACDR  Okay. Got the - got the OPTICS at ZERO?
13 07 15  CMP  Yeah.
      ACDR  ...
      CMP  ... pretty close to nominal.
      ACDR  ... right on top of ... ...
      CMP  Yeah.
13 08 56  ACDR  Okay. ...
      CMP  Yeah.
      ACDR  No, if you don't have it, then don't put it in.
13 09 04  CMP  Okay. ...
      ACDR  Pardon me?
      ACDR  All right, I'll get it. What was the temperature?
CMP Yeah.

ACDR Huh?

ACDR Is that the ...?

CMP Yeah.

ACDR Is that the ...?

CMP Yeah.

13 10 20 CMP Oh, good. Hey, this is ... Tom, want to see something ...

ACDR Oh, yeah, that's ...

CMP Hey, Deke, ... this ...

(Music)

CMP Oh shit!

ACDR What?

CMP I got dirt all over me! The lid was off, and I pulled it off, and the damn thing -

ACDR The lid was off?

CMP Yeah.

13 11 18 ACDR Want a towel?

CMP No, I'll get a ...

CMP I know it; I was trying to take it off.

ACDR Oh, I see. Yeah.

CMP ... more difficult.

CMP ... pardon my quick reaction.

ACDR All right. ...

CMP Yeah.
Did you mount that bracket and penlight, Tom?

ACDR Yeah.

ACDR ... all day today ...?

CMP ... A3.

ACDR Can I help you on that?

CMP Oh, I'll have this ... in a couple of minutes.

USA (Music)

... Listen to ... sing.

USA (Music; singing)

CMP (Laughter)

Hot dog! ...

Hey, say, you ought to let them hear it.

ACDR Yeah. Get the one with the showers too. The girls in the shower.

CMP I've got a whole pocketful of good Russian stuff. Stuff - ordinary - respectable stuff.

ACDR Yeah.

CMP Yeah.

Okay.

ACDR Okay. Hold it. Want to get that ... bag? Let's see, this is the fifth day. But why don't ... Is that bag full?

ACDR Yeah, but we want TSB. Why don't we take that TSB. ...

CMP TSBs, though, don't hold much. I think we ought ...
ACDR: Okay. Let me ... I know where the other one is ... the very bottom of U-2. It's in the bottom part of U-2. ...

ACDR: Hey, yeah. ...

CMP: Hey, Tom.

ACDR: Yeah.

CMP: ... but let's play this one first.

ACDR: Yeah.

ACDR: ... is the mike on - in here.

CMP: Yeah. We've got to have one of them for ... to keep the balance right up there. ...

ACDR: ...

CMP: Yeah.

ACDR: ... let me have that tape and I'll rewind it and put it on ...

CMP: Yeah. Well, I thought we would wait for ...

CMP: All right. Fine ... Tell you what we can do; we can use one of them for trash, Tom, and when it came time to jettison, we can try to stow a couple of TSBs in the - put it wherever we could - locker or anything else. If we could keep the bag of solar research stuff, ... trash ...

DMP: We need a new battery, Tom.

ACDR: ... Deke.

CMP: Yeah.

ACDR: ... that didn't work ... did it?

CMP: No, no. You've got to rewind it. No, that Carole King is on the other side, Tom.

ACDR: Oh. I put the right side up, I thought.
CMP  It's the number 2 side - got to be up.
ACDR  Right.
CMP  Anyway, that plays ...
ACDR  ... Carole King ... upside down.
CMP  I ... setting up the ..., but I could do that.
ACDR  Going to do that. Okay. Want me to help you on that, Deke?

13 22 13  ACDR  That's the last one we got. Big ones? Got two ... last one. ...  
CMP  I still think it's ... cause Deke ...
ACDR  ...
CMP  Oh, yeah.
SCDR  Apollo, Soyuz. How do you read me?
ACDR  (Excellently, excellently.)

13 23 04  SCDR  Pressure integrity of Soyuz and interface volume is okay, Tom.
ACDR  (Roger.)
CMP  Well, let's see now ...
USA  (Music)
ACDR  Here you are.
ACDR  (Soyuz, Apollo.)
SCDR  Go ahead.
ACDR  (... this is Russian music.)
USA  (Music)

13 24 09  ACDR  (Do you hear well?)
USA (Music)

CMP Okay. I guess ...

ACDR Oops. Sorry ...

ACDR (... of the launch configuration.)

13 24 42 CMP Hey, do you want to go up?

ACDR See the black bag up there? Let's get those things down.

CMP Okay. Tom. I got one of these - these --

ACDR Where do you want to put them?

CMP How about in here?

ACDR We got the - got the big black bag ...

CMP There you are.

ACDR ...

CMP Yeah, that's okay.

ACDR Okay, the big black --

CMP No, no wait a minute.

ACDR ... that's what it is.

CMP Yeah. Yeah - I guess so.

13 25 40 ACDR Just think about ...

CMP It depends on how long we have to leave it. It - ...

13 25 47 ACDR Yeah, it ...

CMP Well, ... may be ...

ACDR Got it on.

13 26 36 CMP Okay; go on through, Deke.
CMF: Huh?

DMP: ... okay.

CMP: All right.

CMP: Well, first we got to do these things right now. Why don't you get this battery out, and - as soon as I get the battery I'll be able to ... Hey, Tom, you don't need to ... the battery ... pulled them out.

CMP: Hey, Tom. Suppose you can make the food.

ACDR: Sure will. What're we having?

CMP: I don't think ... snack.

CMP: Return to A3.

ACDR: Battery. Got it?

ACDR: Yeah.

ACDR: Got the - got the food all cooked up.

ACDR: Okay, Vance. The wheel's at A3.

ACDR: Did you get done?

TIME SKIP

CMP: Yeah. Okay.

ACDR: Ah-ha. I brought - I got this Conway Twitty, and we'll wait and put it in - in the one that was ... and put it in ...

CMP: Yeah. Well, I don't think - No, I didn't think it was a song. I didn't think was a song ...
CMF Okay.
ACDR ... We may not have it.
ACDR Okay. ...
ACDR How about that. (Laughter)

ACDR BMAG MODE, three, RATE 2. This is after docking; after we've loaded the DAP. I have it checked off. RH 2 POWER DIRECT 2, OFF, and RHC POWER, OFF. BMAG MODE, three, RATE 2. I have it checked off. ... verify. AC ROLL, MNA, B/D ROLL ... COAS POWER, OFF. ... do much from that angle - looking down at those pictures from that angle, doesn't look like ...

ACDR We got Orroral Valley here coming up right now.
CMF Okay.
ACDR Okay. Now let's go to this undocking attitude. I have to hit a VERB 49.
CMF Okay. ... what we got here.
ACDR All righty. Here's the new attitude. Plus 02600, plus 30700, ... ... Everything is checked. Plus 02600, plus 30700, ...
ACDR Okay.
CMF ... ...
ACDR ... maneuver 10:05, 98:35. Want to do it over?
CMF (Soyuz, this is Apollo.)
SCDR  Go ahead.

CMP   (Alexey, we are beginning the maneuver.)

SCDR  Go ahead.

ACDR  Okay. Now ... Okay. ... get an update ...

CMP   Okay. We're getting to Orroral Valley right now.

ACDR  ...  

CMP   ... 

ACDR  ...  

CMP   ...  

ACDR  High-gain angles. Pitch, yaw, okay. Plus 03 - oh, here's - plus 33, plus --

CMP   Yeah. We need to get one bag there, Deke. All you have to do is take it out, use it as is and then stow it back there. But make sure that you got the valve closed and everything ... And, then later ... dump. Huh? Okay. We got a pass over Orroral Valley. He's going to explain a few things. See what he says.

CMF   Actually, you have to open the valve to take a leak, then close it.

ACDR  ... Look there, Deke.

ACDR  ... You got to use the pressure, too. ... It's uncomfortable, I'll tell you.

CMP   ... I - to tell you the truth, never used one, Deke. That's how the big boys told me. ...
Open when the valve is parallel to the line of flow.

I've never liked them. You just - you always ... because you can't get enough ... to see the ..., and you muff the whole thing.

Oh, no. I think ... That's okay. (Laughter) I'd like to ...

Incidentally, Deke, when you put that bag in the ..., and I'll probably - both run up there and see ... When you put that back in there. My T-shirt's in the bag. Give it to me then ... but not - no hurry.

Okay; we've maneuvered to the altitude ... Orroral Valley. We want to get ... Orroral Valley at - should be here now.

Yeah; any minute.

Let me tell you, one thing you need to do is to tweak up that volume.

... Yeah. But do that first. ... I got it. Got it. That - that was an option - that was an option 1, right?

Sure hope we're facing the Earth. Option 3.

We got an option - Oh, we did an option 3; we need an option 1.

We did the option 1.

Okay.

... Yeah, but it gives you an option 3 down ...

That was R-4.

Okay. Yeah.

310
Need a ...

Yeah.

Get the other one; 42. And I won't torque until we talk to them.

Okay. We got contact now.

Okay.

Okay. We're ready to torque.

Okay. Torque 39?

Yeah. But I won't.

... minus 87.

Hello, Houston, Apollo.

... plus - minus 87. Oh, I see. Plus 35, plus 78, minus 87.

Hello, Houston, Apollo through Orroral.

... never came up.

Okay.

This was - this must have been a real low pass.

Yeah.

We'll start the torque later.

Yeah. Deke, ... torques.

... going to torque at 27:45.

I hate to say it, but that God damn bag ...
ACDR ... back pressure ...

DMP No, and I didn't put it in ...

ACDR Yeah. It usually is pretty clean that way.

DMP ...

CMP Hey, Tom. Do we have any other stations ... ATS before we undock?

144834 ACDR Okay. Orroral ... Oh, yeah. We've got Quito, Ecuador, and we got ATS. Ecuador and ATS. ... quite a bit. Okay. We got 30 minutes until ...

CMP Maybe Quito would be a good place to do it.

ACDR What's that?

144858 CMP Then - it'll be at least - wondering until they get the ATS. That's ...

ACDR Yeah.

CMP Okay. That's all finished. I'm going to go up and change clothes about now.

144930 ACDR How about putting this stack of ...

DMP ...

CMP I thought you were going to say you're going to go up into the DM.

ACDR Oh, I might get - I might try that too. ... I would say the pressure ... back pressure ... with each one. ...

145007 CMP Anything going on the Flight Plan today?

ACDR No. We - we did that - we did it early, you know.

CMP Yeah.

ACDR ... I've got to turn on the VHF ...

DMP It'll be about 30 ...
ACDR Okay. ... Okay. Okay; ... and all that free torquing and all that ...

CMP Yeah. Okay.

ACDR We'll have to do another VERB 49 from this angle. Yeah. Hit a VERB 49 ... ... Okay. ... 26 307, ... 00. Okay. Okay.

DMP Okay. Now what do I do? ...

ACDR Okay.

14 52 20 ACDR Okay. Now we go to a P20. Okay. It's - it's 98:30. ... I'll ... It says P20, option 5, quad C ...

DMP ...

ACDR Yeah. Okay. ...

14 53 03 DMP Okay. ...

14 53 36 ACDR Okay.

14 54 18 ACDR Vance, don't start the P20. We don't do it yet. NOUN 78, plus 30 ... plus three zeros ... 47 ... Okay, Vance. ...

14 55 31 SCDR How do you read me?

ACDR (Good, how do you read me?)

SCDR I read you loud and clear. Just now, Valeriy Kubasov and me are in descent vehicle.

ACDR (Roger.)

CMP (How are you?)

SCDR Thank you. Very well. As always.

14 55 57 CMP (Yes. Good man. Fine fellow.)

14 56 04 ACDR Okeydoke. ... attitude ... squared away for awhile?

CMP Yeah.
ACDR ... checklist, here. We got - we got Quito coming up down here at 54.

CMP ... tape recorder, there?

ACDR Yes, and it's all set to go. I'll be back in a minute. I just wanted to ...

SCDR Vance, what is the best time of your working day today?

CMP (How long we ... module?)

ACDR The best time, he said.

SCDR You don't understand me. I ask you, what is the best time of your working day today?

CMP (Today?)

SCDR Yes.

CMP (Laughter) What's the best time? (Yes, I want to say, I will think about it and ...)

14 57 05 SCDR I see.

CMP Let's see. What the hell. Well, let's see.

SCDR Do you like ... day?

CMP (...) Alexey, do I like what?

SCDR ... day?

CMP (I think that, today, the docking was very interesting.)

SCDR You are right. ... solar eclipse experiment.

CMP (Yes. This - this experiment was it ...?)

SCDR I believe.

CMP (Okay.)

SCDR ... from the ground.
SCDR The ultraviolet experiment will be a good experiment.

CMP (Yes. ... very important.)

SCDR Yes.

14 58 36 DMP ... in the Flight Plan about your ... camera? ...

DMP ... 

CMP No, I don't know of anything. I - I don't think in practice we ever had any of that ... turning that on and off.

DMP ... 

14 59 21 CMP ... to go.

DMP ...

CMP Maybe I'll ... It'd be nice to have some, though. ... I wonder if we just ...

DMP ...

14 59 35 CMP Yeah. I - I think we ought to do it on our own if we can --

DMP Yeah.

CMP -- do it without lousing up something else.

DMP ...

CMP Good idea. Okay. We'll need the Hasselblad in there.

DMP ... let's see ... 

ACDR After you torque, while you're up there, I'll need another VERB 49, you know, because ... angle ...

CMP Oh, okay.

15 00 18 CMP (Soyuz, Apollo.)

SCDR Go ahead.

CMP (See the horizon? It's a beautiful sight.)
Let's see. Very nice. ...

(Yes. ... of course.)

(Do you understand) pretty good?

Yes, sir. Of course. Of course.

(Laughter.)

(Of course, it is Russian - -)

Oklahoma language is the same as Russian language.

(Laughter)

(Yes.)

Very difficult for everybody.

(Laughter)

(They speak very slowly in Oklahoma.)

Like Tom?

(He talks fast - faster.)

... 

(Did you understand the words of the ...)

Yes. Of course. Vance, I'll tell you, the FE said, "Alexey, do you understand Tom?" I said "Of course." But I don't understand. I wait to hear something about ... if I hear. But I don't understand Tom.

(Laughter)

No, that's a problem.

(It's very good to fly together in space, isn't it?)

Very excellent.

It is necessary to fly in space together with our wives; I believe after this ... are going to understand each other.
MS  (Laughter.)
CMP  (That's very correct.)
CMP  And when it's not possible to understand women.

15 03  28  CMP  Okay. It's getting about time to --
DMP  Okay. 99 --
CMP  (...)
SCDR  Go ahead.
CMP  (Alexey, please turn the ranging on.)
SCDR  RANGING, ON.
CMP  (Roger.)

15 03  54  ACDR  Okay. VHF A, OFF.
CMP  A, OFF and B to DUPLEX. RANGING, ON. Okay. ...
DMP  ... ...
DMP  ...
CMP  Nope. Gosh darn.
DMP  Maybe you hit the RESET.
CMP  No.
DMP  (Laughter)
ACDR  Okay. Set the DET counting up to the undocking pad time. Okay. Now, we think it's going to be 99:07.
DMP  ...
ACDR  Okay. All right. Let's go to the passive undocking checklist ...

15 04  52  SCDR  Preparing for undocking.
(Yes.)

ACDR  We got ... DELTA-V SET.

DMP  There's something wrong here. ...

CMP  Maybe it's because we're too close, Deke.

ACDR  If you're too close, you get kind of harmonics and all that.

CMP  Better turn it off, maybe ...

15 05 18 ACDR  Turn it - I'd turn it off and leave it closed. Are you out of film on that film pack, Deke?

DMP  Yeah.

ACDR  Well, there must be ... film pack. ...

DMP  ...

ACDR  Yeah. But we - we got - we've got - we've got some color exterior, though ...

ACDR  Well, any bandolieros [sic] up here? After this ...

CMP  You guys each have your urine bag - -

15 05 47 ACDR  ... forward in the fucking whole edition.

DMP  Well, the only thing is, Tom, we've already got six ...

ACDR  Yeah. I think it's great. Just pick yourself ...

DMP  ... forget this ...

CMP  Yeah.

15 05 56 ACDR  That's right. But why don't we just - That's got more priority that the other thing.

DMP  (Laughter)
I - I still think we ought to ask Houston if they can suggest a mag and then --

ACDR All right. If we don't, we're getting fucked whether we ... or right.

15 06 18 ACDR Okay. Let's go through these. Hatch 3, CLOSED. Hatch 3 PEV, CLOSED; I sure hope so. EMS/MODE, DELTA-V SET to STANDBY, ... Okay. Delta-V to minus 101.3 - pardon me - to plus 101.3. Got it? EMS function, DELTA-V.

ACDR All right.

15 06 36 ACDR RHC POWER number 2, AC/DC. Got it? RHC POWER DIRECT 2, MNA/MNB, right? SPACECRAFT CONTROLS CMC, HOLD, verify.

ACDR ... going to verify this. This --

15 06 50 ACDR Well, we went back to AUTO after we did the VERB 49. We tweaked it up, Deke. MANUAL ATTITUDE, three, MIN IMPULSE. DEADBAND/RATE, MIN and LOW.

15 07 02 DMP Okay.

ACDR BMAG MODE, ATT 1, RATE 2.

15 07 05 DMP ...

ACDR Okay. THC POWER, on.

15 07 10 DMP On.

ACDR COAS POWER, on.

15 07 12 DMP On.

ACDR RHC number 2, LOCKED.

15 07 15 DMP RHC 2, LOCKED.

ACDR THC, ARMED.

15 07 20 DMP ARMED.

ACDR And VERB 16 NOUN 4 ENTER.
We've got to get these circuit breakers ...

Yeah. That - that comes - next thing.

Okay.

Inform Soyuz, "Prepare for - preparing for undocking."

(Soyuz, Apollo. Now we are preparing for undocking.)

Roger.

Okay.

I'll watch the lights, Tom.

All right, should be coming on.

... amber.

Okay. Next one should be coming bright, there.

Yep.

Okay. 2 - 4 - 6 - 8 ... 12. Okay ... got ...

alined ...

... Should be alined with the IMU.

Yep.

Over Quito, we turn ABSORPTION POWER, ON. I guess this time after 99:04 I'm going to be ...

Okay. Acquire ATS, ... down here at 90 - Why do we still have that O$_2$ FLOW HIGH?

You got that off down there, that valve?

... checking ... Yeah. That ... going on ...

Everything off?

Yeah.

Makes me want to try - -

... malf.
ACDR What?

15 11 22 CMP It was the - urine thing that broke open.
ACDR Did you put it closed?
CMP Yeah. Closed it.
ACDR Okay. What do we got?
CMP Where's the ...
ACDR Got to be ...
CMP What?

DMP Got to be ... Well, I'm going to ... while you're ... There's dirt on it.
CMP Dark picture. ...

ACDR We got plenty of film on ... Hasselblad, but it's not out, is it?
DMP ...

ACDR Perhaps we should have a new one on here. No.

15 12 19 CMP ... it's got 23 ... the other 15 ...

DMP What is that? Look down there.

ACDR ... Well, it looks - it looks as if the ...
CMP Huh?

ACDR All out?
CMP Maybe we should ...

DMP Yeah, it did. ...

ACDR Okay. Put this back ...
Okay. I wonder if we've been shooting blanks?

I don't know. Okay. ... go ...

Okay. The film's okay for the - that's the reflex, right? CX12. ... CX12 from A-6. CX07 and CX08 from B-5. We'll clear up ...

Okay. We'll get the CX12. If you want to hand me the old one, I'll put it away.

... 

You've got a slide back of the window somewhere. A cloth.

On the window?

I mean on the ... Yeah. ... 

Okay. ... working here ...

Here you are, Vance.

... B-5. ... get one more thing in.

That puts us back, what?

Same place ...

Yeah.

Okay. That's 47 minutes ...

Apollo, Soyuz. Are you ready for undocking?

Yeah, I can get ... other side.

(...) 

Houston, Apollo through Quito. How do you read? ... ABSORPTION POWER, ON.

Okay; let's go to that monitor - monitor we have for the ...
CMP Looking good.

DMP ... On the test meter position. ...

CMP ... Well, let's see what it's doing. Okay; it must be about C, 8. Okay. It must be 8, C. Okay?

DMP Make sure. ...

CMP I did.

DMP Okay.

CMP ...

ACDR And I got that on time. ...

ACDR Houston, Apollo through Quito. How do you read?

ACDR Houston, Apollo. Houston, Apollo. If you read, we forgot to give you absorption power. We'll acquire ATS - in another 3 minutes when we undock. ...

CMP You got ATS set up?

ACDR Yep, I got it set up; I'll reverify that.

DMP Okay, now Vance, ... as far as I'm concerned ...

CMP Okay, but I don't want to rush the part where we're getting into min impulse burn. Seems like - you have to be in a hurry to get your maneuver.

DMP Yeah.

ACDR Okay; --

DMP Mainly, I guess we'll ...

ACDR -- passive undocking checklist.

CMP Right.

DMP You - you don't have ...
ACDR Vance, what time you got?

DMP ... undocking. At this time, we set the clock.

CMP At when?

ACDR 56. ... All right, I got a bunch of things ready to go through ... burn ...

DMP Yeah. Okay.

ACDR Say, you ought to set this over there.

DMP Yeah. ... I want to go to ...

ACDR Right. Right.

DMP ...

15 18 28 CMP Hey, Deke. You got a spare in your pocket?

DMP Yeah. It's ... I need one for this ...

ACDR Okay. ...

DMP Well, Vance ...

CMP Want your jacket? I'm going to get mine.

ACDR Put it on, you mean? Yeah, I think I will too ...

DMP Only because that one little old thing.

ACDR You want a spare flashlight bulb right now, Vance?

CMP Yeah. I - I've got a good one ...

ACDR You got a good one. Well, you ought to - maybe when you go down there, ... Both of mine are stuck up here on the ...

15 19 10 DMP I got one spare. The others have been ...

ACDR Yeah. But I need one to go down --

ACDR I had it right here in the ...

CMP How much time we got?
DMF

ACDR

ACDR

ACDR

CMP

ACDR

15 20 22 ACDR

15 20 34 ACDR

ACDR

ACDR

ACDR

ACDR

ACDR

ACDR

ACDR

ACDR

15 22 53 SCDR

ACDR

SCDR

SCDR

DMF

30 minutes - Well, we got 4, I think 4 ... I ... preloaded it ... time. Take it from storage. ...

... I had it right here before we docked because I wanted to get ... right here.

Okay. ...

... show, huh?

Well, wait. We hit - came up with the ...

Yeah, we still got - we still got ATS - should be coming up at 59. We should have ATS now. We got it.

There you go.

Roger, Bo. Read you loud and clear.

Roger. RELAY and we have the UV ABSORPTION POWER, ON, at 98 plus 56 plus 00.

... Not really.

... I don't - I don't want to tell. I could ...

Yeah.

It's right over me. ... for the docking module.

Apollo, Soyuz.

... We are ready to undocking.

Okay. ... DAC on right now. Okay. We never got any film in there, did we?
Well - Yeah, I ... 

Undocking, Tom.

Okay. (Roger.) All right; okay. AUTO RCS, 16, MAIN A and MAIN B. EMS MODE NORMAL. DET, STOP. Turn DAC on.

Okay; and then monitor. ...

Houston, do you have any recommendations for a new film magazine for the DAC?

INTERFACE SEAL COMPRESS, OFF.

INDICATOR, OFF. INTERFACE SEAL COMPRESS, OFF.

Is that interior or exterior?

Evap deactivation. It's already done.

Any of them back in there? Let's not get all wrapped up in that ...

Yeah.

Or we'll blow this son of a bitch.

That's right. If they can give us the mag, why - fine, if not ...

Okay. I got one thing here.

We're liable to --

Let me see if it will work.

We're liable to separate any time now.

Okay.

Then, man, we got to go.

Okay. That's right ...

Okay. We're ready for it, too.
DMP Yeah. Damn sure.

15 24 45 ACDR Okay. You got ... Okay; monitor -

CMP Looks different. I still --

ACDR ...

ACDR Is CMC ON?

CMP Yeah.

ACDR Okay. ... 

CMP ... Okay. You told me to press through.

DMP Yeah ...

ACDR Okay. It's ...

DMP Yeah.

ACDR Can you just ... with it?

DMP Yeah. ... Boy, I'm glad it didn't get that 1-1/2 on that ...

CMP Shit.

DMP Okay.

15 28 01 ACDR Okay. I'll - Okay, I'll ...

SCDR Tom, be careful.

15 28 07 ACDR Okay. VERB 45 ENTER.

CMP Okay. 

ACDR Okay; VERB 45 ENTER.

CMP It's in.

ACDR VERB 31 ENTER ...

15 28 14 CMP Yeah; got it.

ACDR RHC LOCKED, verify ... securely locked ... ... down.

327
MIN IMPULSE ...

... now.

(About 20 meters.)

Okay.

ACDR 15.

(I can see the antenna.) Okay; he's coming up. You're okay, Deke. Hold what you've got. Yeah. I can see his antenna coming up. Coming up ... right there. Back off from him. Back off. You may have to go to SPS and back off ... Go up.

Yeah. Yeah ...

You're closing on him.

Okay. ...

Yeah.

I'd say you're about 40 feet - maybe 35.

...

Okay. We're going down ... still closing.

... everything else in here.

Get that switch?

VHF RANGE SET.

... DELTA-V SET, BACKUP.

Okay. So, Deke, keep 18 meters ahead of him --

Yeah.

-- 8 degrees body and P20 is going to do its thing. EMS DELTA-V SET, BACKUP. You got all that stuff?

Yeah.

Okay.
ACDR ... back ...

15 30 15 CMP Okay. EMS SET, BACKUP.

ACDR He's going to the right a little bit. I still think --

DMP ... got the right attitude.

CMP About lined up on ...?

15 30 33 ACDR Well, but he's supposed to ...

CMP You got to remember, now, your - 58's holding local horizontal there for you.

DMP Yeah.

ACDR So you need to back up and go to the right - or I can go for - Okay; you got it. Okay.

15 30 48 DMP Man, this is ...

SCDR Tom, what are your range now? Rate.

15 31 28 ACDR (The rates are ...)

ACDR ... the VHF RANGE ...

CMP ...

ACDR Back it up ... to the right.

DMP I know, but ...

ACDR Oh, shit! ... backed it down, Deke. Look out.

ACDR Backed it ...

ACDR God damn.

CMP HAND CONTROL POWER's OFF, Deke.

DMP Was it off?

15 32 08 CMP Yeah, I got it on.

ACDR We called that one off on the list.
DMP  Huh?
ACDR  Yeah, we called that ...
CMP  Okay; you want to try ...

15 32 19  ACDR  Back to tracking now.
DMP  Okay.
CMP  Okay; we're all right now.
ACDR  Okay. Try it again, Vance.
ACDR  You got it?
CMP  Yep, ...

15 33 01  ACDR  Wait a minute, wait a minute, wait a minute. ...
CMP  I'll give you a VERB 58, and you can take your maneuver here.
ACDR  Okay.
CMP  Okay ... maneuver ...
ACDR  Yeah.
CMP  You'll have to move down there.
ACDR  Yeah.

15 33 02  ACDR  Okay.
CMP  Okay?
ACDR  Look at the pitch. I still think ...
DMP  ...
ACDR  God damn. I don't like the pitch. ... pitched up too high.
DMP  That's all right. Just get lined up with ATS.

15 33 18  CMP  Let's see; we're going to go to ... What are we ...
ACDR  ... back off of him ...
Okay. I ...

... get the hand controller and --

Yeah, I know.

Yup.

... get the hand controller back on.

I know ... asking what about rates.

Yeah - EMP. Got it back on.

Okay. He's coming up.

All right

He must have ...

Okay.

Get a COAS check.

Good.

We'll try again.

Okay; I'll hit it.

Something wrong with those angles.

Tom, please inform us about Apollo stationkeeping.

(20 meters.)

It's useless going on, guys.

... we're lined up along his axis ... Shit, that's the problem.

What?

We're way below him even though we're supposed to be lined up on his axis.
I don't think we're necessarily ... his axis ...

And everything's perfect but ... I can recheck P20 if you wish.

Check that.

Checked it, and we've got it set NOUN 78. Let's see.

... Okay; plus 90 degrees, minus 82.75, and plus 180.

Okay. We're all right, Deke.

That's all right.

Got to be.

Remember the last time around --

Yeah.

-- ... 

But, if that's the case, we shouldn't worry about it ...

... down here to the ...

Yeah.

Better go up ...

Got 4 minutes?


Really ... won't we?

We're not falling behind yet in what we're doing ... falling behind on his own.
ACDR: Yeah. His orbital ... X-axis ... within his ...
Try to get him on the spotting scope.

CMP: He wanted the - he wanted the lights on so he could see if we could see him?

ACDR: Yes. I'd like to ... There it is.

CMP: Oh, okay.

ACDR: See the green?

CMP: I'll bet ...

16 14 44 ACDR: Deke, ...

CMP: Deke?

DMF: Yeah?

ACDR: Now he's coming around behind us.

DMF: That's where we're supposed to.

ACDR: You have the one ...

CMP: No, that's him rotating, too.

CMP: We're not all that --

ACDR: ... yeah, I got him.

DMF: ... are those beacons ... 50 meters.

CMP: Yes. We're starting to go behind him now. Okay.

16 15 25 DMP: Right now, I got about a 3-1/2. Let's see, we're within 100 meters, right now. ... 

CMP: ... must be 10.

DMF: Yes. That's been the bias in that all the time. Depending on ...

CMP: I guess --

DMF: I'll keep it in the bottom - right ...
Great!

... I just want him to skim through it.

Yes.

We're coming in at what angle?

We're at - 295 right now. No - 45 degrees. Not very far back. I'll tell you, Deke - if we don't start falling behind pretty soon, we're going to have to take a pulse ...

Maybe we ought to do it right now. What's the ...?

Okay.

To AUTO? CMC, AUTO?

Ah - yes. It's CMC, AUTO - and --

Pulse left.

Pulse right. ...

Left - left.

I mean --

...

-- left.

...

Back to SCS?

Yeah. Then I --

Then we keep tracking him on --

I'm tracking.

... Okay, it's going down. Little better. Boy, your up/down is beautiful.

I'm pretty sure ... 3-1/2, so we shouldn't be - We getting some rate on that thing now?
Yes. I - it just started climbing, though. I think you need another one - another pulse ... But I don't know. You can't get too much closer without having the spotlight on them.

Yeah. I'm in the process of ...

Tom - Put it down to 1?

Yeah.

He wants the spotlight?

Well, I don't - That - that doesn't bother me. That's going to be - ... ... off the bottom ... 150 meters.

Let's put it on for 2, anyway. All right?

Well, I'll tell you what, Vance. I'll just put in ...

(Soyuz, Apollo.)

Want more? Okay.

Roger.

There's your spot. Look at that. Great.

Right in the field.

I think --

Hey, we come in there ...

Roger, Tom.

MAN ATT, three, MIN IMPULSE.

All right.

Okay. Your --

I see your spacecraft very well.

(Yes.)

I see you. I see you - and your friend.
Where Dekey-Wekey now?

What's that?

Said where is Dekey-Wekey?

(It will soon be over ...)

You're right, Vance. You're right - right.

(I think you could hear it.)

We are going to talk about it after our flight. Tom, I have seen your flash.

(Yes.)

What?

Maybe he's got a flashlight in there?

Can you smoke cigarette?

(No, cigar.)

(Yes.)

Okay; let's get a picture of that.

Oh, very good picture, very good picture! Your spacecraft made of gold.

You ready?

Yeah. Get the right exposure.

... we got 16 millimeter. Anybody got - Wait a minute.

We got to get a CX - CX 04.

Okay. Got it? God! Look at that!

Got the movie camera?
ACDR

No.

CMP

Don't even know where it went to.

16 29 12

DMP

I got the movie camera, but I ain't got no film.

ACDR

CX04 is where it's called. It was just out here about 30 minutes ago.

DMP

Let's go and we if we can find one.

16 29 18

ACDR

That's what I say. Screw all the other experiments. This is the number 1 priority for flying the mission. Fuck. Take all the film you want.

16 29 42

ACDR

I am.

DMP

Boy, we're going to have a problem here now, though. That Sun's going to be right in my fucking eyeballs. Well, I think I'll maneuver out of the way. Boy!

DMP

Okay. How much time have we got until we do the - 500?

ACDR

Okay; just let me look at the Plan.

CMP

Well, I'll tell you. Here's a CX05, if it isn't shot up.

DMP

It won't do us any good right now, because ---

ACDR

Yeah, color exterior.

DMP

Yeah, except that Sun is bright. ...

ACDR

Go ahead and load the thing up.

CMP

I may have to scream for help from someone.

ACDR

Okay.

16 30 33

CMP

Here's the PAO --

DMP

That's good. Hand it over.

CMP

--- ... Yeah.

ACDR

I - I --

337
DMP  ... If you want --
ACDR  -- I can handhold it over here if you can ... over here, Deke.
DMP  Yeah, but ... into the Sun, Tom.
CMP  Okay. I'll do it.
ACDR  I can see him okay.
DMP  Oh, I see.
ACDR  I can see him in good shape.

16 30 46  DMP  Yeah, okay. Well, I'm not worried about the pictures at this stage. I'm worried about losing him visually ...
ACDR  Yeah, I see. The Sun's coming out right behind him.
DMP  Yeah, I know. ... I can barely see him.
ACDR  I - I've got him. I can get him with the movie camera.
CMP  Oh; you can? Okay, then, let me give you the movie camera.
ACDR  We better call him ...

16 31 07  SCDR  Roger, Vance. It's a very good show.
ACDR  Let's just string it out. That's okay.
DMP  ... up there. That's right.
ACDR  Got the power on?
DMP  Well, he pulled the plug. Vance pulled the plug on it. Here it is.
ACDR  Oh - okay. I can --
CMP  No plug on that thing.
ACDR  That's okay. I'll just put it ... you put it across at the beginning ...
DMP: You don't see the Sun, Tom, huh?

ACDR: No, I ... see him out in front of me.

DMP: I'll be damned.

CMP: (Please.)

SCDR: Tom, I see you have not ...

ACDR: (Yes.) ... part of me. I can't get ...

CMP: (Please, hold your cue card.)

DMP: Seems pretty upset that you were going to be ...

DMP: That's why they wasn't predicting.

16 31 50 ACDR: Yeah. It'll go by in a minute at orb rate.

CMP: Yeah. I don't think you'll lose ...

CMP: I think the rates are pretty --

ACDR: Our rates are in good shape here. I can still see him out of a quarter of my ... You're okay. You've got perfect spacing. Don't sweat it. Vance ...

CMP: (... like a grown up.)

16 32 13 ACDR: Okay; let's make sure we've cleaned up these ...

CMP: Yeah.

ACDR: It's okay, Deke. I can look way down in the corner ...

DMP: Yeah. I don't see him. I'm working my way down here.

CMP: Can you maneuver to local horizontal? You're supposed to aline the IMU when you get a chance, and we'll set the DET up to the 500 meter.

DMP: Depends on where and how ... Okay, what's --

16 32 34 CMP: Tom? I'll bet you a nickel Alexey wants you to turn on those lights until the programed time.

ACDR: Yeah. ... Damn.

339
That would have been the most frustrating thing in the world to ... that old son of a bitch the one time you need it.

Okay. We got him finished. Okay.

One thing that worries me is that window. That could bomb out the whole thing, too.

Sure could. I got 17 minutes to ...

What's the high-gain angles.

I find you can see him if you kind of stay along the window.

Yeah. I wonder if this --

Well, what are you ...

Man, we could see him outside, I think, 100 meters, Tom, with that spotlight.

Oh, yeah. That's what people said you couldn't - Jimmy said - Jim Sutherland said - over 300 feet with it. He got the same spotlight.

... ...

Well, I'm glad it's not biased the other way.

Yeah.

We could have flown ... this week ... relied on it.

Well, soon as we started out, kind of allowed the God damn relative position ...

Yeah. I wonder if he's got his beacon off now. No?

The damn light's not where I can see it.

Maybe ... you ought to remind him. ...

We supposed to call him on it?

Yeah. (Soyuz, Apollo.)
ACDR  Hand that to ...

DMP  Want to have this, Tom?

ACDR  No - no - okay.

CMP  (Soyuz, Apollo.)

16 34 43  SCDR  Go ahead.

CMP  (Alexey, release ... communication ... double VHF SIMPLEX.)

ACDR  Hell, I can't see him because of the Sun angle.

DMP  Well, I can see him enough to go --

ACDR  All right.

DMP  ...

ACDR  What we've got into the roll ... getting fucked. ... roll ...

CMP  Okay. Our EXTERIOR LIGHTS RENDEZVOUS, OFF?

ACDR  I think we've fucked.

CMP  ... spotlight. And configure for VHF SIMPLEX, which I think was A, SIMPLEX. ...

16 35 48  CMP  Okay; you can roll to a heads-down attitude when you're ready, Deke.

DMP  ...

ACDR  Well, okay. You got to have a new - yeah, you have to have a new VERB 25 NOUN 78 on that ...

CMP  Nope - not - well, when we start the roll maneuver. But - I guess we could ... until Deke is ready here. ...

ACDR  ... 90, 972 ...

CMP  Right.
In other words, ... the roll. ...  

Deke, can I set your DET counting up to 100:50.

Yeah.

Then, as soon as Deke says go, why - then we could ... that, I think.

You better get that foot a little higher; you'll hit the roll.

Yeah. ... hand. ... docking mechanism. Okay. ...

Say that wasn't ...

Pretty bright, isn't it?

Tom, at this time, I'm going to restation our spacecraft from 104 to 020.

What ... back to zero ...

You understand me?

(Roger.)

... I wonder if we could get him to wait - -

He's only 17 minutes late. He's only 17 minutes late here.

Tom, how do you read me?

(Roger, ...) I got him. ... tying him down ...

Oh. Just now, I am going to - do the following maneuver. From ... to zero.

(Roger. Roger. Go on, please.)

... Say, and I'll tell you - ... I've got this ... camera here ... spotlight ...

... the Sun out of the window. ...

Okay; go ahead Vance. ... NOUN 78 before we roll? It is, isn't it?
Yeah, uh-huh. But if — Right, it's usually before. If you set it now ... you'll get a NOUN 58.

Yeah.

And it will say — take us to another attitude.

Yeah.

...

Well, that was exciting.

Yeah.

God damn. I figure we got data from what — about 3 degrees here. Something like that?

...

... lucked out ... Because theoretically, that thing should have been ...

The thing is that the burn charts were working pretty good. What to do to those oxygen ...

Yeah.

...

... Deke.

Oh, I see him now. He's up there.

Dropped down below again ...

(Laughter) God damn. That could burn your eyes out too, couldn't they. Yeah, I see him; he's coming out.

... pretty good ...

Tom, Soyuz orbital orientation established.

(Roger.) I'll be fucked if he claimed it wasn't.

...

Yeah. Not with respect to us they're not.
ACDR    Yeah. But ... the horizon.

CMP     Yeah. Not with respect to - We're level with the horizon.

DMP     I'm going to get up ... roll.

CMP     Maybe he's still --

DMP     ... MAN ATTITUDE.

ACDR    May be yawing 180.

DMP     We're looking down his God damn neck.

ACDR    Yeah. His axis - X-axis - that's ... I thought he was yawing.

CMP     My COAS is on him.

16 42 31

ACDR    Wait a minute; I see what he was doing. But it must be taking him forever. See that? Yawing now.

CMP     Aw, hell. He's getting fucked doing it. That's a weird looking spacecraft.

DMP     Really weird. ... Yeah, we're going to get good ...

DMP     Okay; now before we start the 500, ... 180 roll, right?

16 43 20

CMP     Yep. Don't know ... to get all the data there.

ACDR    Okay. Got a ready.

DMP     ... behind him. Let's see a 180 - We're going to be - he's going to ... Right? ... should be reading right now.

CMP     ... schematic ... looking at it sideways. And I believe that's what you do.

ACDR    ... we're a - we're out of plane ...

DMP     ... reflector's on the right side of it.

DMP     He ought to get yawed - he ought to be doing his yaw 90 degrees to the left ... the reflector.
CMP: What's that?

16 44 23 DMP: Why would he be there. He's going to... around and move out of plane, and instead we'll end up yawed 90 degrees, ... reflector to look at.

ACDR: Are we in plane now?

DMP: Not quite, but almost. We're in plane, we're just not... yet. We... even gone to zero degrees yet.

DMP: Well, let me get up over here for a minute.

CMP: And any time you want to roll, why --

DMP: ... ... I want to get that lined up...

CMP: Tom, why don't you give me that... the numbers in the computer, but I...

CMP: Okay. NOUN 78.

ACDR: VERB 25.

CMP: Okay.

16 45 33 ACDR: Plus 90 degrees, plus 9725, plus 18000.

DMP: ...

DMP: Oh, shit! ... Get setup for the roll?

CMP: Yeah, we're setup now.

DMP: Okay. The problem is the computer... roll...

CMP: Computer will roll. Computer is rolling.

DMP: Yeah. Got a low rate, though, with that.

ACDR: Yeah.

DMP: Let me get up here and really...

CMP: Okay. Come to think of it, though, entered...

ACDR: You did?
Yeah. ...

Okay. I guess I'd better go back and reload the originals, again.

... seems to think so. It starts in about a minute or so.

Probably ...

We're getting this uplink activity light - light ...

We are? Here it is ...

Okay.

The first one is okay. The second one is minus 8275.

Okay; give me the whole thing, and we'll back up.

Okay; plus 90 degrees.

Plus 82.75?

Minus 8275. Plus 9 and minus 8275.

Plus 0?


You want this camera back over there?

... pictures. ... before they do the ...

Okay. ...

Okay. Plus 90 degrees.

Okay.

Minus 8275. Plus 180; 180 degrees.
Okay. We ... ... you guys are ready, I'm going to begin the roll.

16 49 22 ACDR Okay. ...

CMP Okay.
ACDR Ready?
CMP I'm ready.
ACDR Ready, Vance?
CMP Yup.

16 49 28 ACDR Okay. Let me ... Okay. Vance, enter those new numbers?

CMP Yup.

16 49 32 ACDR Okay. MANUAL ATTITUDE ROLL, ACCEL COMMAND. MANUAL ATTITUDE - RHC, roll 180 degrees at 2 degrees per second.

DMP Okay.
ACDR ...
DMP Okay.
ACDR Ready to go?
CMP/DMP Yeah.

16 49 54 DMP What happened here? ... There we go.

CMP Yeah. That frightened Tom. (Laughter)
ACDR (...)
DMP ... COMMAND. Won't stop rolling.
ACDR Did it stop?
DMP ... God damn.

16 50 17 CMP You're in MIN IMPULSE. Oh, I see. Okay.
DMP  Wait a minute ... rolling.
CMP  Yeah. ...
DMP  Oh, okay.
MS   ... after awhile.
DMP  Go ahead, Tom.
DMP  Whoops, there's the God damn ...
ACDR They are, Deke, making it tougher than hell.
DMP  I think they're doing something, and I discovered they hadn't.
ACDR  ...
CMP  Okay, Tom?
ACDR  Yeah.
CMP  Give me the new numbers now.
ACDR  Okay; the new numbers: plus 90 degrees, plus 97.25, plus 180. Oh beautiful! Right there, Deke, you're there. Continue horizontal.
DMP  ...
ACDR  Roger. We've just rolled 180 degrees, Bo.
16 51 31 ACDR  Okay. Back to CMC AUTO.
CMP  Deke.
DMP  What?
CMP  Got a picture.
DMP  Go ahead.
CMP  Okay.
ACDR  (Soyuz, Apollo.)
SCDR  Go ahead.
Okay. Power on, and it's bleeping back and forth ...
0.3 ...
(Moscow, I read you.)
I'm going to close up on him just a little. Our ...
too far out.
Okay. You hear what he said he's going to do? He
wants ... rear reflectors.
(Regards to the personnel and thanks for your good
work. We'll receive your congratulations after the
flight. Great thanks.)
I didn't hear what he said.
I couldn't remember what you - what Bo said.
(Yes. MCC Moscow wants to talk to you over our ship.
Over.)
Okay, we are ready.
They're ready; they got it.
We all set here now?
Yeah. You're all --
(Moscow, Moscow this is Soyuz. How do you read?)
ATTITUDE SET to GDC.
(Thank you. Read you loud and clear.)
Where is that?
It's on the checklist. It's not important.
(We are located now ... At the right, we see the
Apollo spacecraft.)
CM function ...
(Everything is nominal.)
Okay, how we --
USSR (Thanks.)
ACDR They want to use their rear reflectors.
DMP ...

16 54 03 CMP You know what? I don't want to get them in trouble or anything, but I'm wondering if they have a light leak in the window ...
DMP You can damn well see some light in the window.
ACDR ... Yeah. That's right.
ACDR Okay.
CMP That just might be what ...
ACDR Oh, okay.
CMP Houston, Apollo.

16 54 44 CMP Loud and clear, Bo. Bo, we have a question.
CC-H Go ahead.

16 54 51 CMP We thought we could see a light leak in their window - or perhaps not covered - one or the other. Would that have any effect?
CC-H We'll check.
CMP Look at the contrails down there.
ACDR Yeah.

16 55 13 MCC-M (Soyuz, this is Moscow. How do you read me?)
ACDR Can't you see the way the damn clouds are moving?
CMP Oh, I see. Those, you mean. I thought you meant --
ACDR Yeah.
CMP -- some kind of ...
ACDR Oh, no, no. See the way the clouds are moving?
CMP Oh, yeah.
17 06 30 DMP ... you guys, we're coming up here on 4 minutes.

CMP Okay.

DMP 101:28.

ACDR Roger. Is that the data take?

CMP That means that we can be late ... 30 minutes.

DMP/ACDR No.

ACDR 101:08. That means we got to be there - a data take in 24[?] minutes.

DMP Okay; we're counting down and we got ... minutes to go.

CMP I thought you said start the burn.

SCDR (...)

ACDR Understand, Bo.

17 07 36 CMP Okay. Tom, are there any last-minute things before 59:30?

ACDR Don't think so. Okay; let's - Oh, ... RCS - SCS RATE COMMAND; RHC, ARMED.

17 07 48 CMP Yeah. That's ..., but nothing from - up to that point, huh?

ACDR Nothing here. We got the get evaporator deactivated and get plus Y to the right ...

CMP Looks like we got good initial conditions here.

DMP ... window there?

DMP (I see you, Alexey.)

SCDR We see you.

ACDR Houston, Apollo.

SCDR I see Vance now.
DMP  (...) 
SCDR  Very good. 50 meters.
DMP  (Well.)

17 08 44 ACDR  Okay. On this start here, right now we're going in-plane forward; and he's yawed 90 degrees. Affirmative?
DMP  I don't know what he's going to do.
ACDR  Is he going to keep his present --
CC-H  ...
ACDR  Okay. Yawed 90 degrees to the velocity vector. All right.
CC-H  ...
ACDR  (All right) ...
CMP  Okay; they're doing ... Right.
DMP  ... right. Okay.
CMP  And 59:12.
ACDR  ...
DMP  Yeah. That'll do ...
CMP  Okay.
ACDR  ...
CMP  Go to SCS; three RATE COMMAND, MAN ATT; and RHC, ARMED. Hey, you did 11 degrees both ways, Deke.

17 09 45 SCDR  (Moscow, this is Soyuz. I read you excellently. How do you read me?)
CMP  You wanted auto maneuvering.
DMP  I think the maneuvering, Vance, unfortunately, is going to be --
I think you're still about 25 feet from...

I'll back...

(Moscow, Moscow.)

Check the maneuver, Vance, I'm going to drop.

Okay; no sweat.

Okay, we're back banking now. All right.

They may have to come down about 12 degrees.

...

Four degrees, yeah.

(Moscow, this is Soyuz. I hear you excellently. How do you read me?)

Let me get the yaw around; the yaw is in now. Okay?

Yaw is right in.

Uh huh.

... Where you want to be?

...

(Moscow, this is Soyuz. I read you excellently.)

(Roger, Soyuz.)

Now the situation is as follows. Apollo went by our rear, and we saw it through our right window. The distance was about 30 or 40 meters. It is holding distance very well. Now I'm watching it through the right window. And we'll maneuver should something happen. Over.

Okay; how's the --

Okay. Your roll is...

(It is a 180-degree roll, in relation to us, upside down.)
Okay; yaw is ...

Okay. How is the pitch coming there now?

You're about 11 degrees --

Okay; I'll ... the auto maneuver.

They're still yawed 90 degrees, Bo.

It said 90 degrees in the orbital plane, here.

They're not yawed in plane, Bo; they're 90 degrees to it.

Roger. Understand. ...

Okay. Thanks, Bo. Thanks, Bo. For your info, we grabbed that one because we couldn't find the first one you called up. It was a PAO mag.

And, for your info, Bo, the last time we came back into plane, we were still in the dark, and ... Sun rising right behind the Soyuz was a real bear. Can anybody tell yet if that's going to happen next time around?

Okay. I just wanted to inform you that the last time around, we came into plane in darkness, yet. And turns out that the sunrise is directly behind Soyuz. And we had a difficult time there until the Sun got over our head. I would expect the same thing to happen at the 500 meters.

... and I understand ...

Hey, wait a minute. We're behind - we're ahead of him now. We are be --

Yeah, ... We are behind him going forward - we are behind him going forward. We are plus-X forward in the plane.

Will be when we get around there.

Yeah, the second one is just coming back in an opposite direction, sort of.
ACDR Yeah, ... yaw zero.

CMP ...

DMP ...

ACDR ... damn right.

CMP Where?

CMP Okay, you'll ...

DMP Just wait a minute and I'll --

CMP Okay. You're real close now - 4 degrees ...

17 15 35 SCDR (...) 

CMP Okay; you'll see them --

DMP ... see them.

CC-H Apollo, Houston. We'll be - we'll be coming up on sunset here in just a few minutes.

ACDR Okay.

CMP Okay; it's coming in by itself.

DMP ... Coming in.

CMP Now it's a matter of going in. Be a little harder in the dark.

DMP ... CMC?

CMP Yeah. First you better go ahead and go back to the configuration for NULL ... as before.

17 16 03 DMP Yeah. Okay. Now where should I be in the ...?

TIME SKIP

17 49 16 ACDR You want the spotlight on him, Deke?
Yeah. How far out ... 44?

Houston, Apollo.

Apollo, Houston. We got out to .24 on the EMS, which is obviously biased.

... on the 500. Roger.

Okay.

Think we should ...

Good. Okay.

Oh. ... see he's out there, ... turn those off.

Okay.

... I think we - we got two good data takes ...

Yeah, it's very likely ...

Where are you - where are you at down here?

Okay. We're at ..., Tom.

I don't have that.

Look down past the 28-minute burn. We've done the MIN IMPULSE, the CMC, RHC, LOCKED --

CMC.

We've got a VERB 16 NOUN 04 --

Yeah.

..., COAS, and after ... we get in close enough to stop, why, that's when it's - we'll be - Later, we'll be in SCS.
DMP... going to need that...

CMPYeah, I think. Let's not be doing the work that's ---

DMPMight as well do that 50. ... we'll be in primary ---

ACDROkay. Primary glycol ---

CMPP...

17 51 25ACDRPrimary glycol activation.

CMPOkay. You got that? You're going to the sextant?

ACDRWhat time is it? Yeah, we've got - we got finished up pretty quick.

CMPPretty close, yeah. Just about on time.

ACDRYeah. Yeah, we're right on time.

CMPI'm going to the sextant? What time is it?

CMPI think we've got - we got finished up pretty quick.

CMPPretty close, yeah. Just about on time.

ACDRYeah. Yeah, we're right on time.

CMPI'm going to the sextant? What time is it?

CMPI'm going to the sextant? What time is it?

CMP... your clock.

DMPYeah.

CMP... good. And... quad ... Right about ...

DMPOh. Oh.

ACDRWhere'd you find the,CM ...

CMPI found it up in ... I don't know what it was doing there.

17 52 22ACDRIt's supposed to be in the docking ...

17 52 48DMPI think I got some ... film ...

CMPVery good.

CMPI think I got some ... film ...

DMPOh, yeah. It's beautiful ... came over the horizon down there. You can see the backlighting on it - the silhouette. ... things ... my camera ready. Go to the ... attitude in 5 ...
Yeah.

Aha. That ... is CX04, PAO. Ha - ha. Right.

You know, I still can't get used to the fact that the sky and the ground seem to flip-flop.

Oh, yeah.

Yeah.

You peek out there and you think that blue stuff is the --

...

-- ground.

Yeah. Sure does it.

Boy, his spacecraft sure looks good.

Green ...

Huh?

Looks like green ...

Earth obs and solar eclipse.

Think we already did the solar eclipse. ... Far as I know, there's only one magazine ... Earth obs. Gee, I hope -- ...

Yeah.

Ready? (Ready? ...)

We took ...

...

We've got to get a good picture here of this thing.

Yeah.

... Let's see ... It's really far out. We can go with a spot, change the light. I probably won't though. Let's see, Sun will be --
The Sun's coming up.

... 

... 

... How're you going to ...?

..., Deke?

I can do it right here.

Apollo, Soyuz. What is the range now?

(Ah, Valeriy. Right now, 5 feet.)

3 feet?

Oh, Deke?

(5 feet.)

(Okay.)

Here it comes. Get it. Man!

... (Laughter) ... Still don't think those ... engineers ...

Maybe not.

... we've got it spotlighted.

Yeah.

Okay.

...

...

...

Well, it's about 0.3 or 0.4 - It really doesn't ...

See, got ...

Yeah; 0.04, Tom.

... And the next ...
But that's quite a way ...  
Yeah. Should be—we're supposed to be through ...

(We didn't have dinner ...)

(...)

... lights. Turned them off.

Yeah.

(... dinner)

Roger; ...

Yeah.

Okay. You break out 90 degrees from the orbital flight plane.

What? Ah, well ... roll ... is not ... It can go out of band. We're coming in one ... of his ... because --

We're coming in ...

Yeah.

Okay. ...

Yeah.

...

Okay; I'm going to get this ...

Okay. SCS and RATE COMMAND.

Okay. RATE COMMAND ...

And I'll start monitor --

... COMMAND. Okay.

Go on MANUAL ass—ATTITUDE, MIN IMPULSE, all three.

(Laughter)

MIN IMPULSE.
CMP Track Soyuz. And ... NOUN 78.

DMP Okay. It's a little high in the ...

SCDR Tom, when are you going to finish your work?

ACDR (Soon.) ... finish your work?

CMP Hey, look at all the clouds that's down there, all ...
circle.

18 03 59 DMP They didn't tell whether to push her down or not...
          Tom. Hold on. Okay. RATE COMMAND?

CMP Okay. Yeah.

DMP ... MAN ATT and pitch, RATE COMMAND, huh? Right?

CMP Yeah. RATE COMMAND, three of them.

18 04 17 DMP Okay. ...

CMP And --

DMP -- want to pitch down.

CMP Okay.

DMP Four jets?

CMP I think --

DMP Okay. What do you think? Supposed to be --

CMP Okay. The up one.

CMP Yeah. The only thing is I don't know when you pitch
down ...

DMP Yeah.

18 04 42 CMP Okay. ... up. Yeah. Okay. The other one's okay.

DMP ...

CMP Okay. Meters are doing fine. Your up down's pretty
good.
DMP ... I've got to get it back in here ...
ACDR ..., Deke?
DMP Yeah.
SCDR Tom, what is the range now?
ACDR (Right now ...)
CMF ...
SCDR Apollo, Soyuz. What is the range now?
DMP Tell him ...
ACDR Yeah.
ACDR (Soyuz, Apollo. Right now, 55 meters.)
DMP ...
CMF Yeah.
ACDR Yeah, yeah. I think that range is normal.
SCDR Apollo, Soyuz. How do you read?
ACDR (Okay. Excellently. How me?)
CMF Okay. You're up to 5 degrees. ...
DMP Plus 5?
CMF No, you've got to go minus ...
18 06 27 ACDR (55 meters.)
ACDR What step are you at?
DMP Oh, about ...
18 06 47 ACDR (... meters.)
DMP ...
ACDR What ... have you got? ...?
Okay. That's 15.

... looks like 30. Been waiting ... 20 meters.

Yeah.

Right.

(Laughter)

(Look at your orientation lights.)

Yeah. Going back to 3 degrees? Yeah.

Orientation lights off; beacon off.

18 07 50 DMP Probably be 20 minutes before you can --

Okay.

We're supposed to do it right here.

How do you read me, Tom?

(I read you well. How do you read me?)

I read you well. Okay; what is the range now?

5 degrees off of roll --

(58 meters.)

... 

18 08 11 DMP ... over there, we'll go minus X for 3 seconds.

Did you finish your work?

(Yes, I had my breakfast.)

Okay. Let's go to minus X.

... 

...
Yeah.

Plus for 3 seconds?

Right. ...

Yep.

Tom, did you collect data?

Yeah. (Goo - good data.)

Okay. Now --

Okay.

Okay. You ready? Let's get going. MIN IMPULSE, CMC, RHC LOCKED, then - well, I'd let the computer take it. ... this VERB ...

Turn to --

I think it's down.

It's up.

No. I think it's down.

Well --

Okay.

-- since we're almost - Well, --

We're about there. Let's take it. Okay; this is - MIN IMPULSE ...

CMC, MIN IMPULSE.

CMC. Yeah. ...

Have you got CMC ...? Got --

Get it?

Yep.
CMP And lock RHC?

ACDR Yeah.

18 10 11 CMP We're locked up.

DMP ...

CMP Yeah.

ACDR I think ... I don't think we've got it all.

DMP Okay.

ACDR I don't see his ...

CMP Okay. Your needle's are set ... Okay; I don't ... never went down to low. We're down to --

ACDR You want me to take that?

CMP -- 112. Yep.

ACDR Okay. ...

18 10 48 CMP Yeah. Okay. What's next?

DMP Don't know.

CMP Okay. ... back.

DMP ...

CMP Okay. We're going to do this at 50 meters for a heck of a long time, so when you get a chance to, GDC aline to 0,0,0. And we'll set the DET up. We've got quite a way ... Okay; there's 102:16:00.

ACDR You subtract that ..., huh?

CMP Yeah.

ACDR Maintain 50 meters.

DMP When are going to do ...?

ACDR Aw, not too much longer.
DMP Then we'll be back ...

CMP We don't have as much time to wait as you might expect to — Let's see, 102:16 plus —

ACDR ...

DMP ...

ACDR Okay.

DMP Okay. If you want to, you can aline that ...

ACDR You want to set it up — check the checklist? Check on page 7-16. You want the checklist? He wants the checklist.

CMP Yeah. I'll have to check. I'm right in the middle of the checklist.

18 12 40 CMP Okay. You listening, Tom?

ACDR Yeah.

CMP GET is 102:16. And that's plus —

ACDR Plus — 7.

CMP 7.

ACDR It's 23 or 22 to ...

CMP 37 ... Yeah.

ACDR Start it in 7 seconds.

CMP I - Oh, yeah. I'm sorry. ...

ACDR Oh.

CMP ...

18 13 05 ACDR Okay. (Soyuz, Apollo. Right now, turn on second VHF SIMPLEX. Soyuz, Apollo.) Soyuz, Apollo.

SCDR Go ahead, Tom.
18 13 49 ACDR (Excuse me. Delta 2 VHF SIMPLEX. Over.)

SCDR We received you.

ACDR (Okay.)

CMP Hey, your ... got in too close, ... (Laughter)

ACDR Okay. We've got ...

CMP ...

DMP Yeah.

CMP Okay.

DMP ...

CMP ...

DMP ...

DMP ...

ACDR Yeah, I - How much was that last one?

CMP What rev's ...

ACDR ...

CMP ...

DMP ...

18 18 50 ACDR  ... No, ... I don't want --

ACDR  ... What page?  ...

CMP  ...

SCDR Did you already finish your work?

ACDR (Yes. I finished everything.)

18 19 46 SCDR In 5 minutes, we are going to photograph Apollo.

ACDR (Roger.)
ACDR Coming up on that maneuver now?

SCDR (You know?)

CMP ...

18 19 56 ACDR Okay. Here we go.

ACDR Okay; verify. Okay. When we get up to there, which is 102, 3, 4, 5, 6, 7, 8 - at about 8 -

DMP ... here?

ACDR Translate down ...

DMP 102 ... 3, 4, 5, 6. Okay.

18 20 21 ACDR That's where you've got it? I've got MANUAL ATTITUDE, RATE - I've got FDAI scale 5 and 5, SCS -

SFE Are you ready for me, Tom?

DMP Four on, 2 seconds.

ACDR I'll get back to you.

SFE Roger.

SCDR In 4-1/2 minutes, we are going to photograph Apollo at range 130.

ACDR (Thank you.) At 1 what?

CMP At range 130, I think he said.

ACDR (Repeat, please.)

SCDR Soon, we are going to follow your work.

ACDR That's it. 2, 9 -

18 21 03 ACDR 3. ... guidance; in time!

DMP Big, bad -

ACDR Start getting it!

CMP 3 seconds -

368
ACDR Get - get it in FREE, pitch rate.

18 21 11 DMP Going FREE.

SCDR 4 minutes.

DMP ... Tom? ...

SFE Okay. If you be finished, we are going to finish your work.

ACDR (...)

DMP Don't think I do. ... ...

CMP Yawning.

DMP Big yaw.

18 22 06 CMP Off. ...

DMP Okay; now. Okay. You got it? ...

18 23 16 CMP 51:30, about 4 minutes.

TIME SKIP

19 14 20 CMP Check out the ...

ACDR ...

CMP ...

ACDR Process the VERB 49.

19 15 00 ACDR ... Okay. ABSORPTION POWER, OFF and COVER, CLOSED.

DMP ...

CMP ...

DMP ... close the ...

19 15 20 ACDR Why do we ... with out-of-plare angle? Why in the hell are we closing the covers ...?
Oh, ... getting ...

Yeah. No. That's right. ... has a question. ...

Houston, Apollo.

... checklist, Tom. ...

... out-of-plane data attitude. Shit! ... power ...

Okay; what's next?

... out-of-plane maneuver and then ... Flight Plan. 103.

... the urine dump?

..., right?

... 37 - It's supposed to be ...

...

...

We're 102:50. ... out of plane ... 102 ...

Yeah, ...

...

... two ...

... gimbal lock. ...

45 degrees. ... Okay.

We already closed these covers ... okay ...

We're not on ATS.

After the maneuver, ABSORPTION POWER, OFF ...

... yaw?

249.
Power down BMAG 1. ... Okay.
MARK.
MARK. ... BMAG ...
...
Is that a star out there?
No, that's urine. (Laughter)
Yeah. ... Sure, I thought it was ...
Well, Myrtle's shaping up.
I'll tell you, this urine system ... a hell of a lot better than ...
Have any - ...
Yeah. The ...
... where it ought to be.
... in A-5.
Oh. I see.
...
He went over to ...
I think.
Yeah. Yeah. Oh. That's right. Oh. I got that out ... Okay. You know - ... before we get ... we have to get all that stuff stowed away.
Yeah. I know ... bring small ones and the ...
Yeah. A-5, I guess, is where bags are.
... bags, yeah. We got bags. ... bags.
Let's see, where's ...
Oh. You're looking for ... I thought you were looking for film bags. Okay. ...

... 

Deke, ... think you can get that bag down?

You want to play that on Alexey?

Girls' showers. Yeah, why not.

Why not. (Laughter)

Wonder where ...

... it right up there ...

You ready?

(Soyuz, Apollo.)

Go ahead.

(... party.)

(Recorded sound effects)

...

(...)

...

(Laughter)

Did you hear it?

(...)

(Laughter)

... Alexey.

(Laughter) ...
20 00 06 CMP Oh, what are we going to do tomorrow. (Laughter)
DMP ...
ACDR Yeah. They sure did.
DMP Roger. ...
SCDR Apollo, Soyuz.
ACDR (... We read you, Soyuz.)
20 01 41 SCDR Why - you have ...
ACDR (...) CMP (Okay; I understand.) Wait, wait. Wait, wait.
SCDR Okay.
20 02 32 ACDR That's okay.
ACDR Okay.
SFE (Moscow, Soyuz. How do you read?)
SFE (We performed loading at 10 - 22 hours, 55 minutes; 21 ... 1 hour, 21 hours, 55 minutes, 22:55; voltage, 27; charge, 21; and load, 20. Everything onboard functioning normally.)
CMP ...
20 04 28 CMP That's good.
ACDR That ... good.
USSR (...)
ACDR ...
SCDR ... (Yes, yes. ... disconnected; connected it to connector 12 in the OM.)
USSR (... turned off. FM simplex remains.)
(Now ... we are getting ready to perform.)

... make ...

(The capacity is 164, primary RCS is 88, and backup is 20 kilograms.)

(... from 0.34 to 0.41.)

(...)

TIME SKIP

Apollo, Houston. Goldstone for 6 minutes.

Apollo, Houston. We're 1 minute from LOS Goldstone; Newfoundland in 5 minutes from now.

TIME SKIP

(Is the picture all right?)

(...)

(Is the picture all right?)

They're all joint activity ... And 9, 10, 11, and 12 are ... Soyuz. U.S.S.R.

Okay. Well that's half of the obs stuff. The other Nikon thing - the other Nikon ... ... , Valeriy. I finished ...

Yeah. The one I got out - the ones I took yesterday were - You finished them up. Those ought to be good.

Yeah. ...

Okay. And we've got one more if I ever find the camera. Okay, but how about these CIs, 104 and 112?
ACDR  Well, I've got enough ... 5, 6 ... 

22 27 47  CMP  I'm going to check off the ones we're calling. Okay. You've got 3, 4, 5, 6 and what? 7?

ACDR  I got 5 - got 5, 6, 4, 12, 7.

ACDR  2, CI03.

22 28 36  CMP  Just a second. I got ... Okay, 2 and what?

ACDR  Got CI03. 3.

CMP  Yeah.

ACDR  4, 5, 6, 7 --

CMP  Yeah.

ACDR  -- 12.

CMP  Okay.

ACDR  ... exterior.

22 29 01  CMP  Oh. Well, 02 we don't need. That's DM checkout.

ACDR  That's right. ... 

ACDR  Here's the exterior ... 

22 29 15  CMP  Okay, just a second. Okay, call one out, and I'll see what it is.

ACDR  CX01 ...

CMP  Okay. That's TD&E.

ACDR  ...

CMP  That's dock. Okay.

22 29 29  ACD

ACDR  3.

CMP  Okay. That's test undock.
ACDR 4.
CMP That's Soyuz photos.
ACDR 5.

22 29 38 CMP 5 shouldn't have been used; that's for entry.
ACDR Okay.
CC-H -- minor pad changes for tomorrow's ... we can get to work on them as soon as we can.

22 30 11 CMP Okay, understand.
CC-H Okay. See you at Hawaii.
CMP Righto.
ACDR I got a bunch of ...
CMP Aloha.

22 30 27 CC-H Aloha.
ACDR Okay, Vance. I got that stuff down in A-5 for us. ... 2 we used for Earth obs.
CMP Okay.
ACDR Now, that --

22 30 40 CMP Yeah. U-2 is getting too crowded.
ACDR Yeah. We'll put that in the last ... got all that film ... that PAO ...

22 30 49 CMP A-5. Nothing else in A-5?
ACDR ... Nothing much.
CMF Make that other ... the bottom sack ... ... Okay. Do you want to check off the rest of the things, though? Like, we never went over the HRC and --

22 31 08 ACDR Which ... do we have out of the Hasselblad ...? I got a bunch of them ...
CMP: Yeah.

22 31 12 ACDR: Let's just mark that one ... CX12 ...

CMP: Okay, now that - isn't that the one we had on today, or what?

ACDR: No, that's the one ... I shot all those ...

CMP: Uh-huh.

ACDR: ...

22 31 29 CMP: Oh, that - oh, I took the - took it off and I guess you put it back on.

22 31 31 ACDR: What?

CMP: ... just didn't have any magazine on ...

ACDR: ... I'll put ... CX ...

22 31 43 CMP: Yeah. And after that, today we put 55 on here, and I looked at it and I thought, well, that's quite a bit ... quick release on it, so I pulled it off.

ACDR: Yeah.

CMP: I gave it to you and put it up ... warmed up this camera.

ACDR: You gave it to me and I shot ...

ACDR: Yeah. You want this? ...

22 32 41 CMP: Ahh, I'm going to look at M-2 to be sure just what I'm talking about. But today, after all the big action, I gook off a magazine.

ACDR: Oh, you did?

22 32 52 CMP: I - I think I did cause it had 55 on it. Maybe ...

ACDR: No. No, it wasn't. I looked at it. ...

22 33 08 CMP: Yeah. Let's look in there.
ACDR  Go ahead.

ACDR  ...

22 33 13 CMP  You and I are doing okay. We got this to do until 106:50. But we do need to be set up ATS. ...  
Pitch 23, yaw 299.

ACDR  Okay.

CMP  ... Okay. ... Next thing we got is a UVA roll scan and Deke's off doing his ... We'll do that - start it around 50; we got a half hour or more yet to make sure the ..., I guess.

ACDR  ...

22 34 54 CMP  Yeah. And that's what they want the most, I think. PAO quick release is not movies but it's ... Tell you what, you go down and ...

ACDR  ... have to go to that P20.

22 35 29 CMP  No. I don't think we want to do that until we get close.

ACDR  Is there exact time to proceed on that?

22 35 38 CMP  Well, you know, that's one of those dealies where we'll pull out the supplement, probably. I - I don't know. I'll have to check. The exact time is someplace. We do have some raster scan EMP stuff tonight.

22 36 11 CMP  Yeah. I know I put that - that thing --

ACDR  Did you change it out after ...

CMP  Yeah. I know I put it over here. ... just see where it is.

22 36 25 ACDR  Yeah. That was the one that ...

22 39 26 ACDR  Yeah. ... we have ...
I got a feeling - unless - except there are five more frames than when I took it off. Let me see if there's another one.

Okay. That one's -

You know I think I finally discovered why they never like to have us shoot all the Hasselblad stuff mixed. Because probably the ... figures once the PAO guys get it, you'll never see it.

Yeah.

Well, I don't know. Let's see what this says, docking - Yeah. I - I wrote on there, docking TV, --

Oh.

But I meant film. Well, anyhow, that's good.

Why don't we get another bag - we'll have - we'll have two bags full.

Okay.

In the second bag, there's some other stuff. That was the one we took off, and I think this is the one that I popped 35 on. We haven't been shooting much today and - on ...

I - maybe shot a half a dozen times. You know --

Okay.

- - when we went over Africa, and we saw ... - -

Yeah.

- - that Levantine Rift.

Yeah. I know you said it. Okay. Well, all the rest of the stuff - you got - you got the camera?

It's up in its usual spot probably.

No, it's not.
ACDR There it is. All right. I shot about - at least three sites.

CMP Okay.

ACDR Suppose to put these two on. That should have what we got on ... the Hasselblad. There's still a bunch left in there. Okay. Should we get a little - another --

CMP Okay. You say you want to - somewhere to put this, so we'll have it for a quick release?

ACDR Yeah. That one - that bag is all filled.

ACDR You might check down in A-5 there, any of them will do.

CMP Yeah.

ACDR Just so it'll hold a couple of these.

CMP I guess what I'll do is just get a Hasselblad bag out of B-5.

ACDR Yeah. That's a good idea. You know, where's that - looking ahead in the Flight Plan, we have a mapping pass and a visual obs pass.

CMP Yeah.

ACDR Do you know where that big Hasselblad is?

CMP The mapping Hasselblad?

ACDR The black one - yeah, the black Hasselblad.

CMP No. The last time I even thought about it, it was over on that corner over there. I don't - I - I wouldn't suspect it's in the TSB back there, but I don't know.
22 46 04  CMP  Okay. I'm going to designate this one "PAO quick release."
ACDR  Okay. ... camera ...
CMP    That's probably all.
ACDR  Yeah. It's my option ... tell them that.
ACDR  Shoot. I've lost at least two pencils. ... let me find one.
CMP    Maybe I got an extra. Oh, yes. I got a - I found it somewhere.
ACDR  ... contact the ...

22 47 14  CMP  Okay, tell you what. We'll - I'll put this down with that other - Hell, did you lose the pen too?
ACDR  No, I got it. Say, I'm missing one Pentel.
CMP    I got a --
CC-H  Apollo, Houston. We're 1 minute from LOS Hawaii. We'll see - see you when you get locked up on the satellite.
CMP    Okay.
ACDR  Put it on 10 over 40. 4.

22 53 40  ACDR  Got it.

22 53 56  ACDR  Okay. On 808, is that thing hooked up? Is the cable hooked up? Just pull the camera around to make sure it's the right one. Okay. On 808, the CAMERA SYNC to CM/DM ...

22 54 30  DMP  TV SELECTION, select DM, DML.
DMP    DML STATION POWER, ON.

22 54 45  DMP  I go to 181; I'll take care of this on 181. Next thing you do is obtain the wicking demonstration. I'll go down to 181 and set that up for you.
Can I help?

No. ...

Okay.

Well, maybe three is too many in the way. Need me to read your checklist to you while you're doing it?

... CM POWER ... That's what I'm going to do.

Come on up, Deke.

Okay, the next thing. Obtain wicking demonstration. Mount baseplate on food tray, third Velcro row.

... 

Mount baseplate on food tray, third Velcro row.

Okay. ...

Mount baseplate on food tray, third Velcro row.

Obtain yellow syringe, attach yellow ampule. Yellow syringe, yellow ampule.

You want a bag to put this stuff in?

... yellow syringe. Obtain yellow syringe, attach yellow ampule.

Fill baseplate with water, holding the syringe vertical. That mean water out of the gun or out of that?

Portable light, high; and DAC, on.

Fill baseplate with water, holding syringe vertical.

Portable light, high; and DAC, on. Panel 400. VTR POWER, ON; HEAD WHEEL DRIVE MOTOR, ON; and RECORD.
Yeah. ... wait until ... halfway up before you -
Wait until I turn this on.

VTR is coming ON, HEAD WHEEL DRIVE MOTOR, ON and MODE
RECORD. Shouldn't this have a green light, Deke?
Vance?

What's that?

... 

RECORD? Yeah, it should have a --

Green light.

-- green light.

When I go to RECORD, I get nothing.

Did you go to HEAD WHEEL first?

Yeah. The HEAD WHEEL DRIVE is already ON. ...

Did you get it?

... 

Okay, Deke. You all ready? All right. Just turn
the DAC - portable light, high, and DAC, on. Then,
after I've got that, place wicking assembly 1 on
baseplate.

... number 1.

DAC, on.

Okay. After wicking has proceeded halfway or 3 min-
utes' duration, remove - remove the wicking assembly
and discard; it says fecal bag. ...

What was that?

The TV camera shooting the ...?
I don't think so.
After wicking has proceeded halfway or 3 minutes, discard wicking assembly ... Repeat steps 7 through 8 for wicking assembly 2. ...

Vance, how you doing?
Okay. I'm just looking ahead on something ...
... what film bag ...

Discard ... Okay. Repeat steps 7 through 8 for wicking assembly 2.

That ... roll scan does kind of have me puzzled.
That damn that portable light's in the way.
Oh, no, it doesn't. We've got the UVA on now. That's right. ...

... supposed to be looking at the ...
...
... portable light.
... turn on the DAC.
...

Okay. After that you clean baseplate with tissues and place it back on the tray. Obtain the black syringe and ampule. Fill the baseplate with oil ...
Clean the baseplate ... if I turned the DAC off ...
Clean baseplate with tissue ... back on the tray. ...
...

Yeah.
...

Yeah.

... 

That's what we're ...

That thing is starting to shut the ... down. ...

Yeah. That's no ...

...

Kind of like ... Myrtle once she closes those doors.

Yeah.

...

Probably. Yeah. Close the doors ...

(Is the picture all right?)

(Yes, how is the picture there?)

# # #
DAY 201

00 47 47  CMP  ... back in here. ... That's where we were having all the problem.

ACDR  Yeah. That's where we been ..., all those problems.

CMP  Okay. You understand.

00 48 07  CMP  So after this we can power down and then hit the DSE and all that. I wonder how long they want you to do this.

ACDR  ... ATS. No we're not.

00 48 22  CMP  Dick, how long do you want this raster scan to run?

00 48 29  CC-H  6 minutes, Vance. And we're about - you'll get a flashing "37" when it's - when it's done, and you're - and after that you can go ahead and do the next maneuver. We're about 30 seconds from LOS and Ascension comes up at 108 plus 40.

CMP  Okay.

ACDR  High bit rate ...

CMP  Huh?

00 48 48  CC-H  And, Vance, one reminder. We'd like you to acquire the ATS as soon as you get in attitude.

00 48 54  CMP  Okay. Okay, let's see. What's that about high bit rate?

ACDR  ...

CMP  Okay. You were saying something about high bit rate?

00 49 04  ACDR  Oh, high bit rate.

CMP  Well, at the end, all you do is go stop, and there's a - no, no - no, no - not yet.

ACDR  Oh. We've got to stop for ... here.
Well, but if you have to start ...
... stop, stop.
Okay. ...
Okay.
Houston, Apollo.
Check off this ...
Okay. We got ... in the ...; we got to set this attitude after the next ATS. Minus 64, 292; 121, it's right away after the maneuver.
Minus 64.
*** ATS ...
Don't close WASTE STOWAGE VENT valve until 109:29.
Hey, that's because, I think - I wonder if that's open now. They think it's open, I guess. We did that purge last night. I'm sure it's ... I wonder if it's open; probably not.

Purge?
Yeah. ... that - the - you know that purge valve we were supposed to have in there?

That 90-degree elbow?
Yeah. I don't know - -
It's there.
Okay.
It has to be open. ...

Yeah. We - you know, we closed it not - I guess -
We had to had [sic] a purge valve or I wouldn't question ... a purge last night.
ACDR: What about the battery? Did it ...?
CMP: It should be open.

00 52 29 CMP: Tom, the urine thing ought to be closed.
ACDR: WASTE STOWAGE VENT's closed, ...
CMP: And, let's see, got a LiOH canister change.
ACDR: ... to take a couple of hours.
CMP: How'd it work out? Reasonably good?

00 53 18 ACDR: ... the raster scan going. Okay, flashing "37".
CMP: Okay.

00 53 29 CMP: Okay. EUV powerdown and X-ray powerdown.
CMP: And, as soon as you do that, I'll configure the DSE.
ACDR: Okay.

00 53 50 ACDR: EUV powerdown. TELESCOPE POWER, OFF; COVER, CLOSED.
CMP: Let's see, STOP and then REWIND, FORWARD.
ACDR: Okay. X-RAY PURGE, CAL and hold it for 30 seconds.

00 54 56 ACDR: ... LOW POWER, OFF, center ... Okay, you're shut down.
CMP: Okay.

00 55 37 CMP: Oh. Did you go STOP and COMMAND RESET ... VERB 4?9?

TIME SKIP

01 25 08 ACDR: This God damn thing keeps counting and we got ...
CMP: Are you running, Tom?
ACDR: Yeah.
Do you want me to reset it or anything?

Roger.

Okay. Now we got that fifth ... we do not maneuver on the 58 deal, on that P20.

That's right.

That's old DAP coming back in ...

Yeah.

Counting up.

Okay, and then we go - we stationkeep and go to a P20 after. Yeah, okay.

All right.

Okay, that's - this film, ... talking about.

Okay.

On the FDAI[?].

If you got time, why don't you go down there and stationkeep.

Yeah.

You got the film for docking? ... docking ... The main thing is we can get it ...

Get the camera.

Okay, I’ve counted up 3 ... here.

What's left?

Thank you, Vance.

Yeah.

Here we go.

... clock.
ACDR  Okay.
01 26 22  ACDR  ... AUTO.
CMP   Okay, ... VERB 58.
ACDR  You got a VERB 46 in there?
CMP   Yeah.
ACDR  Okay, VERB 58.
CMP   Okay. We'll wait till this maneuver --
01 26 33  CMP   Okay, GO for the burn. Good. ... got to be sure ...
ACDR  Yeah.
ACDR  Okay. And 40 seconds, Deke.
DMP   Yeah.
01 26 55  ACDR  Body diameter's about 8 degrees. THC forward; 1-1/2[?] feet per second on EMS[?].
CMP   Okay; ready for the THC.
CMP   Ready?
01 27 07  ACDR  THC POWER on?
CMP   Ready?
ACDR  Yes.
CMP   Ready?
ACDR  Go.
CMP   Now try it.
ACDR  God damn ... 
CMP   Is it working?
ACDR  EMS isn't working.

391
DMP: Sure you got it in NORMAL?
ACDR: What the hell's going on?
01 27 19 CMP: It's thrusting.
ACDR: Is it?
01 27 20 CMP: Yeah.
01 42 17 CC-H: Apollo, Houston through Guam for about 6 minutes.
01 42 23 CC-H: Roger. Vance, this is the way - I have a feeling that you guys - -
01 47 58 CC-H: - and a yaw of 258, and we need to get those.
CC-H: Okay. And we're satisfied with the evaporator now. We'd like the SECONDARY COOLANT LOOP PUMP, OFF. Incidentally, we're about 20 seconds from LOS. I'm going to be standing here - standing by here on these upcoming next couple of STDN passes and also on ATS, and I've got some news here that I haven't had time to read to you tonight. If you'd like to hear it or talk about anything else, just give me a call when we get locked up per the Flight Plan.
01 48 39 CC-H: And if I don't hear from you, have a good night's sleep, and we'll see you in the morning.
CMP: Okay. Ordinarily we'd like news, but ... in the morning. ...
01 48 49 CC-H: ... great. I'll still be here so I'll - I'll be - I'll have it in the morning. See you then.
CMP: And Deke ...
01 49 08 CC-H: I'm sorry, you cut out. ... say again.
CMP: Okay. One last thing, ...
01 49 39 CMP: I don't think I got it ...
01 51 27 CMP: ... think it's ... 109:32:32.

TIME SKIP
392
10 19 07  ACDR  177.

10 19 13  DMP  UP TELEMETRY to RELAY.

          ACDR  Primary evaporator ...

          DMP  I'm sure ...

          ACDR  Where's that water ... outlet at?

10 19 37  CMP  It's right down here at the bottom - kind of at the foot of the hatch, on one side. Here. Climbing in. No. As you climb in the hatch, down and to the left.

          ACDR  ...

10 19 50  CMP  Yeah - No. No, that's - that's the urine and the waste water dump. Let's see. It's down - still in that area. Only it's a little more to the left, I think.

          ACDR  ...

          ACDR  Tastes delicious with lettuce and cheese on it.

10 20 18  CMP  You have to be real careful of it, but it's the best thing I've tasted up here.

          CMP  Okay, it's 20 --

          ACDR  STOP and REWIND?

10 20 38  CMP  Yeah, STOP and REWIND, COMMAND RESET.

          TIME SKIP

10 52 11  DMP  Yeah. Tom's up there right now. Why don't - why don't we do that.

          CMP  ...

          DMP  Here's something for us, get it right now. ...

          CMP  Yeah. I never heard before that.
ACDR  Right there. Baseline, go up and ... correct ...
CMP    Yeah. ...
ACDR    ...
CMP    What are you doing?
CMP    ...
CMP    Okay. ...
DMP    What does it say?
CMP    It says, ...
CMP    Okay. ...
DMP    ...

10 55 25 DMP  Yeah. Once I ... post[?] photos ... photographs ...
DMP    ...
DMP    Then later ... indicators are ... black ... territory ... light ... There's a lot of ... things like ...
CMP    Yeah.
DMP    It's very ...
ACDR    Okay. ...
DMP    What's it say here, Tom?
ACDR    ...
CMP    ...
DMP    ... where we are. ... plus the ground ... where we really are. Now that's ... one light period, ... there's another period ... that free period of photographs ... that ... got those photographs ...
ACDR    ...
DMP ... good angle on it that's why ... ... to follow ...

DMP ... beyond that it just ... got a very - double ... somewhat ... different areas from the other ... light, ... parallel.

10 59 23 DMP In other words, one of the best ... goes up and replaces ... go back and turn parallel to ... I guess it's ..., it ends at the bottom ... the second ... And, ...

CMP ...

DMP I can swing clear of the ... right in the ... ballpark ... So the overall pattern of 1, 2, 3 ... and I think ... photos from an area around ...

ACDR ...

DMP Yeah.

DMP We didn't just find ... we had about ...

ACDR ...

ACDR Okay, let me have your ... That all the ...?

DMP ...

CMP ...

DMP Except for one ...

11 06 01 DMP You got - you guys got ... squared away?

ACDR I'll be - I'll be ...

DMP ...

ACDR ...

ACDR Vance, ... medication?

CMP ...

ACDR Deke, you got any medication?
DMP: No.
ACDR: Okay. How about water.
DMP: There's ... plenty.
ACDR: ...
ACDR: Vance, I think you got a bad cigar going.
CMP: Well, you just ... (laughter). ...
DMP: Glad I got my ...
CMP: ... no way.
ACDR: I'm going up to 6.
ACDR: 5.
DMP: You going up ...

11 08 10
CMP: That's - Yeah, that's a light ... two or three ...
ACDR: ...
DMP: ...
CMP: Yeah. We ought to ... back ...
ACDR: ...
ACDR: I've been in some ...

11 12 29
CMP: Yeah. It was kind of ... last night.
ACDR: All right.
CMP: Yeah.
ACDR: ...
CMP: ... the only thing that we've got on ...
DMP: Well, Soyuz ...
CMP: The only thing that's ... turned off after the undocking ...
11 14 01

CMP You remember when we turned ... docking lights. We turned them off.

ACDR ...

DMF But is there a ...

ACDR ...

CMP What?

ACDR ...

CMP Yeah. They both ...

ACDR They both ...

CMP ... that's when we - that's where we finally get that ...

ACDR ...

CMP Yeah.

ACDR ...

CMP Yeah. I know --

ACDR ...

DMF Tom, ... in about 5 minutes.

ACDR Okay. ...

CMP Tom.

ACDR That's right. You go in front of ...

CMP Yeah. ...

ACDR ...
Vance.

Yeah.

... the whole thing?

Well, how's Tom ... without those frequencies ...

... That's not very true for me.

... five of those.

I could hear the ...

Yeah.

I looked over there, I could hear it pop, pop, pop.

That's it.

... You're okay.

... may have to turn this ...

Yeah. I never tried to ...

But I saw your --

... may have to turn this ...

I - I think the only thing it could be, is that, somehow or another that ... just cut off. ... RCS.

Well, don't you remember, though, ...
Yeah.

You remember looking down in that ...?

... The way that turns off ...

... That's how I put it. ... Up here ...

... All I remember is, those ...

... And - And then I started looking for some film and --

That's just --

-- I said I'm going to ...

... Yeah, then that ... that's the ...

... Try ... to the first and then later ... Well --

You're right. I kind of had a ...

... Yeah. ...

Well, I don't think ... would be ... got down through here.

I tell you what. You go ahead and with your ...

Right. ...
DMP  Great. Let's do it ...
ACDR  Let me ...
DMP  ...
ACDR  ...
DMP  ...

11 21 45  CMP  You want hot?
ACDR  Yeah.
ACDR  ... and rates 22.
DMP  ...
ACDR  Right. ...

11 25 15  ACD  ... seconds to go. 100, 205. ... 100 ... the first time. ...

11 32 28  ACD  ... set up in the same place ...
DMP  Okay.
ACDR  Let's see, ...
DMP  ...
ACDR  ...
CMP  Stars.
CMP  Did you see it ...
DMP  ...
CMP  Thruster.
ACDR  ...
CMP  Let's poke around in here ... from where we know we can ...
ACDR  ...
Yeah. I'll - I'll put it in this TSB ...

... that burn.

Yeah. It's suppose to be 22.

...

Wonder if we can ...

...

That's right, ... So that's correct.

I still think you're wrong ...

Okay. ... Ready?

Yeah.

Okay. You got it solved.

... problem ...

...

4 ...

4 and ...

Tom, you got it?

Not yet.

314.

Tom.

... ... see that fucking alinement.

Pardon?

Did you see that son-of-a-bitch go to ... See there, I got to go back ...
Okay.

Okay. Look for a ...

Okay. Here's what we did ... And the other side of the tape recorder's fixed.

Okay. Where's the Flight Plan? Here it is ...

Yeah.

We got to go back and pick up that ... there's an option it says here.

Okay.

... 05566.

Is that all?

That's ...

Zero, what?

...

Did you read ...?

...

...

... Right.

Okay. I thought it was a ...

Yeah.

Right.

Still got time to do this ...

...
Three lights.

Okay. I figured we have dehydrated grape and orange...

TIME SKIP

You - you got ... Did you get it?

One ... five ...

You, that should make eight.

That's ...

It's going to be too hot for ... to ...

Okay.

Apollo, Houston. We're AOS at Guam for 6 minutes.

Roger.

Oh, shit.

Okay, ...

...

... that's the first ... shave ...

(Laughter)

Either that or start a beard.

Apollo, Houston. I don't know whether you got my last call regarding it, but on the GLYCOL EVAPORATOR WATER FLOW valve - we need to make sure that's in the OFF position. That's center, OFF.

...

The reason for that is that we're - our data looks a little bit funny down here now.
ACDR GLYCOL EVAPORATOR.

CMP Page... 7.

ACDR Okay. We had the switch in the wrong position. Because of the position here, it's hard to tell whether it's center OFF or ON.

CC-H Did you have it in the ON position?

ACDR Yeah. Sorry about that.

CC-H Okay, fine. Thank you.

CC-H Apollo, Houston. We're 1 minute from LOS. Next station contact is Santiago in 32 minutes at 120:57 - 120:57.

ACDR Okay.

ACDR It's almost 11:25[?].

CMP Okay. ...

DMP ...

CMP Yeah.

ACDR ... when you get ...

DMP Yeah, it does kind of start to settle down.

ACDR Yeah, yeah.

ACDR ... DAC.

DMP How was that docking module last night?

DMP Yeah; well, that ... was just right.

ACDR Yeah. ...

12 50 14 DMP (Laughter)

12 50 24 CMP ... I forgot. I remember waking up ...

12 50 35 MS (Laughter)
Okay. We're there ...

... check ...

... in about 25 seconds.

... I don't like having to rush it.

... have to change ...

...

Yeah.

And VERB 21 ...

Why don't you ...

Boy, this tea looks ...

... on the ground I like coffee; here I like tea.

... the flavor ... it's hot ... cold.

Okay, Deke ...

(Yawn)

It's a real ... get a tiny bit more ... gave me a tiny bit less, could manage it all real well.

One thing they can ... interaction.

No. ...

... woke you up ...

... floated off ...

Okay, next.

Is the tape recorder ...?

Do you have it on?
I've been looking for a plain ... a plain ...

... Earth obs ...

... if we have a ...

... the only place I got hot was in the ...

(Laughter) Yeah.

Before we go down, we ought to take a ... flash picture ...

We got an interior film for the DAC[?].

Flash[?].

... almost ...

Okay.

... around here at one time.

Did you look back here? I thought I saw ...

Do you have that cue card for out the window stuff? I wonder if we want to start - start shooting ...

Might as well.

I shot a bunch of pictures ...

I think ... we are ...

(Laughing) Yeah, yeah. I saw the same thing.

... 

Strobe light - strobe light's ... I think down here in the -

Did you find it?

... flash?

Okay. Shut it down ... I'll get that stuff shut down.
13 09 30  ACDR  We got the ZFF with the other one.
ACDR  What?
ACDR  Yeah.
ACDR  ... last night ...

13 12 57  CMP  Okay; you're going to get the ... off aren't you?
CMP  ... I'll have to turn the ... off ... not quite yet ... 

13 13 12  CMP  It'll be in about 5 seconds. STOP,REWIND,COMMAND
RESET.

TIME SKIP

14 15 20  CMP  Oh, shit!
ACDR  Crip, how do you read?
DMP  I can't figure out what's going on here. I heard
him say something.
ACDR  Crip, how do you read?
DMP  He's trying to talk to us.
CMP  What made it go off?
DMP  ... know.
CMP  Are we in PRIMARY or SECONDARY SERVO, now? Do you
know?
ACDR  I don't know. Everything was okay, I think.
DMP  Right. ... Yeah.
CMP  Try it there.
ACDR  No. It's got to be above that. Crip, how do you read?

ACDR  It's got to be above it, 50 percent.

CMP   Okay. Might make it if we hurry.

ACDR  I wish you --

CMP   Oh, yeah.

ACDR  Verify ... --

CMP   No, wait. This is going ...

ACDR  Oh, yeah.

CMP   And they say verify ...

ACDR  Hold on.

CMP   Okay.

ACDR  Take a look at the lights ... tell when ...

14 17 27 CMP   Okay. VERB 21 ENTER. Plus 14690, 1226 --

ACDR  ...

DMP    ...

ACDR  Oh.

CMP   Well, you had it.

ACDR  Okay.

CMP   All you have to do ...

CMP   Now.

ACDR  1226.

CMP   There you go.

CMP   Well, start having the ... running.
ACDR  What happened, Vance?

CMP  The TV went off.

DMP  I just turned it off. It's supposed to be off ...

CMP  Okay. The next one ... Verify DSE TAPE MOTION.

ACDR  ... TAPE MOTION.

CMP  TAPE MOTION's gray.

ACDR  Okay. It's working all right.

CMP  Okay. VERB 49 ENTER. Plus 1.0[?].

ACDR  Plus ...

CMP  1.0[?].

CMP  Okay. Think that problem is nominalist. Suppose to be in PRIMARY ...

ACDR  Yeah.

CMP  Put it - okay, HIGH GAIN, right?

ACDR  Yeah.

DMP  Well, SECONDARY is - In all that thrashing around, it went to PRIMARY and it dropped a ... out about 30 seconds then came back again. I don't understand that.

ACDR  Well, let's see ... set up. Vance, what time have you got? ...

CMP  Yeah.

ACDR  Okay. We're all set.

CMP  We're all set.

ACDR  The new high-gain angles for the next time - What's it say?
DMF: Well, tell you, that's where I woke up; you see, I didn't realize you guys were running ...

ACDR: Why?

DMF: ... trying to get ahead for once ...

ACDR: Pitch is 14 degrees.

CMP: Okay.

DMF: And - Yaw?

CMP: 308.

CMP: Well. That stands to reason. ... pretty rough.

DMF: Yeah.

ACDR: We have Orroral Valley coming up ...

CMP: ...

ACDR: We got ... coming up here in 1 hour.

ACDR: You've got an exercise period after the P20 option 5 ...

CMP: Have to - I don't think ...

ACDR: Let's don't - You're the only one that has to do it.

CMP: ...

ACDR: ... camera. ... shoot out the window. ...

CMP: Okay. ...

ACDR: ...

DMF: See ... Tom's got ... to go.

ACDR: ...

CMP: Oh, yeah. As I recall ...

DMF: ...
ACDR

14 22 54 DMP  Well, that will be fun.

ACDR  Oh, I'm sorry.

ACDR  Deke.

DMP  Yeah.

ACDR  Could you hand me the ... CX14 ...

DMP  ... , there.

ACDR  ...

CMP  Now what happens?

ACDR  Ah - ...

CMP  ...

14 26 48 ACDR  X-ray powerdown. Okay.

ACDR  Okay. You want the X-ray powerdown now?

ACDR  Got that.

DMP  Okay; X-ray's powered down.

ACDR  ... would you ...

14 27 10 CMP  Okay. HIGH VOLTAGE POWER is off.

ACDR  Okay. All kinds of shit on the outside of that window. That's ...

ACDR  Okay. 6.

ACDR  ... else is ...

14 32 08 ACDR  Quite a wobble.

DMP  Yeah.

ACDR  ...

ACDR  Yeah, I ...
ACDR  You want to try looking ...

DMP  ...

ACDR  Yeah, why don't you do that.

ACDR  I'm getting 27 ...

DMP  ... 32.

ACDR  That's okay.

ACDR  ...

DMP  ...

14 39 40  ACDR  Okay; low bit rate.

14 39 53  ACDR  ...

CMP  Okay.  ...

ACDR  ... I got a lot of these ... Yeah. ... spacecraft ... aline. Okay. The next thing to do is
power down, I guess.

14 40 25  ACDR  Okay. Power down. TELESCOPE, OFF; COVER, CLOSED.

CMP  ...

14 40 46  ACDR  Okay. Yeah.

ACDR  Yep. Next thing is ...

CMP  ...

14 41 20  ACDR  Okay.  ..., AUTO.

CMP  ...

ACDR  Huh?

ACDR  He turned it off.

DMP  Yeah. I know, ...
Yeah. You ... Do that first. It has to be powered down.

Oh. Power it down.

Power it down.

... 

Yeah.

... 

Yeah. Power it down. I'll just ... powered down, ... This obs thing is - really super for ... things on.

... 

Is that ... We have ... box in there. We still have ... Hey, Vance, look at that ... Look out the window. ... got here. See that light ... over the ... horizon. Look at that. See the band ... ... see that band.

... We get a ... band and a ... and a yellow band at the same time. Oh, we got a different attitude this time. ... we had last time. You don't ... Are we there yet?

Yeah. ... we got to have this ... down. Yeah, but not a hell of a lot more.

Yeah. That will be roll right?

Yeah. What? Yeah.

Yeah. Also, let me ... set up the ...

... 61101. Let's set the ..., Deke. ... when you finish. I got ...

... 

Yeah.

All righty.
If you're upside down, the Nazca Plain, should be on the right. It says to shoot it upside down. They ought to be ... No, I'd rather have it right side up so the spacecraft is ...

Okay. Starting with the Earth obs, rev - revs 73 to 74. Coming up trying to find ... and trying to look for the Nazca Plain.

Yeah.

Put it ...

Okay.

I don't like this attitude for Earth obs. I'd rather ... heads up and pitch down, like this. See? ... way down in here. See if it fits; don't have enough room. Let me look at this. Can't get down there.

Okay. On the map, ... rev 74, we're approaching the north coast of South America, Peruvian Desert, trying to find the Nazca Plain. The clouds go all the way up to the north of here ... Yeah. That's just the way a cloud ... We really should. Fire away. No, we're ...

Man, this attitude is fucked up, did you know it? It's really bad, you got to keep your head straight back like that and left, right, left. I'm going to have to change this whole son-of-a-bitch around. I really need my headset here. The only ... is the heads up. It's, let's see, you're like this trying to look ahead, just right and left. Then reverse this ... first. I think if we look down in here, which we ought - you can look down here, it's all right. You don't have enough room. Good heavens! ... got it down about like that.

Okay, who ... Yeah. Okay, ...

Okay. ...
How do you read, Houston? Okay. Look. Get with Farouk. This attitude for visual obs, ... degrees. There's no room to twist your head and look upside down, and the whole thing ... ... you reverse this thing so they're - we're heads up and pitch down ... everything about twice as easy. Can you hear me? Okay. We want to roll 180 degrees for this - for vis obs. Not the mapping, but the vis obs ... Yeah. Yeah. ...

We got some clouds over ... It goes west and ... cloud cover. Okay. The cloud cover is ... the west coast of the Pacific Ocean ... of the Nazca Plain, so ... sight of 7B. 7C is also covered over ... And ...

Okay. UP TELEMETRY to RELAY. You already got that? UP TELEMETRY, RELAY?

Houston, Apollo. Do you read? Okay. Did you get my last transmission?

Okay. Look, I'm sure this was optimized because sometimes you do the vis obs at the mapping attitude. I'm now wings level. There - I've got a lot of cloud cover, of course, so I can't see much, so I'm not losing too much by talking to you. What we want to do is to - to ... for vis obs only to roll to heads up. Because if we could sit down behind the couch, this attitude wouldn't be bad. But the trouble is, there's not enough room to sit down behind the couch and look out where you're going. You can't get in there. You're too high. So we want to roll to heads up, pitch down, looking straight forward for the vis obs attitude when it's not associated with the mapping. Can you get Farouk and his troops tracking on that? Over.

Yeah, this heads down; when you look out like that to get the view, you're - you're straining yourself up against the instrument panel, holding your feet in the struts against the tunnel, and everything in the book is left and right. Well, you can overcome
that, but you just can't get the lead-in. I tried sitting upside down on the couch, but the only way you can --

TIME SKIP

15 45 54 ACDR Orange, okay. ... we had all of our snacks.
CMP Yeah.
ACDR Okay. ... the left ...
CMP Yeah, there's a lot left.
ACDR Oh, okay.
CMP But I just - you know, if you start to run out -
ACDR Oh, okay.
ACDR Okay. ...
ACDR ... is it mine?
CMP Yeah.

15 47 00 ACDR ... 000. ...
CMP ...

15 47 15 ACDR 119, 25, 000. ...
DMP Okay.
ACDR ...
CMP Don't worry about it. There it is.
ACDR ...
ACDR Starting to ...

15 48 20 CMP I think your times are wrong.
ACDR What?
CMP ... an hour from now.

ACDR No. There's ...

ACDR You know, when I was in the proper attitude ...

CMF Vance, you got -

CMF Yeah.

ACDR -- Flight Plan is ... keep the same ... suppose to go to ...

CMF Tape recorder, FORWARD, COMMAND RESET.

ACDR Okay.

CMF Okay. NOUN 22.

ACDR ...

CMF Yeah. ... Okay. I've got ...

CMF Yeah.

CMF I think that's ...

ACDR ...

CMF Now why didn't we ...

ACDR Ah, so. Yeah. That's VERB 49 coming up.

CMF Yeah.

CMF Okay.

CMF God damn, we have packed all these things together again.

ACDR All of them?

CMF ..., Deke.

CMF I think the cheese bags are down in the ... I remember --
ACDR... 

15 55 03 CMP And they used to be on the ... but they didn't have room. ... stuck them down under that jacket.

15 56 31 CMP Okay, 6:10. ... a VERB 49 ENTER. DSE, STOP, REWIND.

15 56 54 ACDR STOP ...

16 14 48 CMP Okay, I can get that. I can get the DMP stuff, ...

16 14 56 ACDR Has it stopped?

CMP Yeah. Going ... to manage.

ACDR Shoot. Thank you. ...

CMP Kind of sorry I ate your other one, now.

ACDR ... (Laughter)

ACDR Son of a bitch. That's the ... everybody had a wonderful ... , right?

CMP There ain't no sense cutting them now.

ACDR No. ...

16 15 47 CMP ... that's straight, Tom.

16 29 18 CMP Roger, Crip. Quito for 5.

ACDR Everything's going smooth on the - program.

CC-H I'm sorry we dropped out there, Tom, and I didn't catch all your comments.

16 29 40 ACDR Okay.

16 30 26 ACDR Okay, Crip. Everything seems to be going real good on the helium glow.

ACDR We'll just keep checking up on the ...

CMP Got to be ... the pantry.

DMP Yeah.
Well, maybe ...

Okay, the DSE's stopped, ... RESET.

... FORWARD?

FORWARD - then COMMAND RESET. Got it?

... FORWARD.

We're still working the helium glow ...

You know that DSKY work we did this morning? They caught us - I mean, G.D. ... They caught us right in the middle of our bad time, and it'll probably be interesting because I know I said "shit --"

-Laughter-

They'll just get some real "woids" from the old command module.

Oh, we're passing Florida[?].

... up ...

Deke, could you use any of these yellow pills? I got one batch of them up with To, and I can give - give you this whole batch if you want it.

Hey, Tom.

Yeah.

Here's a can of pineapple.

That's crushed[?] pineapple.

I don't want this chicken salad. Anybody want that?

No thanks.

Otherwise I'll just toss it ... I don't like ...

Yeah.
No, I have one ...

Apollo, Houston. We're about a minute and a half from LOS through Newfoundland. And we won't have you through the ATS until 124:52. At that time, we'll be talking to you about modifying our attitude, so we can put a little Sun on the - the water port, and we will also - I'm sorry, I was telling you a story. We're going to have Madrid in about 5 minutes, INCO corrects me. But we're going to be deleting activating the primary evaporator, and we're going to leave that off the rest of the day if - if your comfort stays okay, and just kind of let that port sublime out.

Okay.

... I can see two airplanes down there.

Can you?

Yeah.

Contrails.

Contrails.

Hey, Dick. Where are we right this minute?

Oh, you're North Atlantic. You're just off the coast of Newfoundland, probably about - almost 1000 miles.

Must be right on the airways. I see a couple of contrails, and I can almost make out one airplane down there ...

It's probably a pretty good - Yeah, that should be just about the primary route between the States and Europe.

Yes.

Almost see the airplane itself.

Yeah.

Okay, we need DSE STOP and COMMAND +ESER.
Okay.
Yeah.

We won't be seeing Russia again, will we?
Yeah; well, because they - well -

Let's see, ... I was going to say - because when we integrate from now on because of the ... cycle.

I can't think of anything that's going off ...

... sure we ...

...

Should have.
Vance, what ...

... finish this in about - when?

Oh, about 15 minutes.

Okay, Deke, if you want, DSE STOP, COMMAND RESET.

Yeah, he brought in this great big gyro. ... just demonstrate ... but kind of at the last minute thing ... Sure, that is. We'll see how it came out when we get down, later.

...

On DSE whe - when - I guess he had a camera running too.

... situation ... water and everything. ...

Mine's 25.

... is 177.

Okay. ...

Yeah. ...

Yeah.
ACDR    ...    
CMP     All right.    
ACDR    ...    
CMP     Right. What's the matter with that ...?    
DMP     ...    
ACDR    Yeah, that's right.    
CMP     I think you can get a ... -  
ACDR    ...    
CMP     -- brought it out on this much - attitude. I suspect the ... are changing. Didn't hear about ... on this mission.    
19 06 54 CMP  Waiting for more ... flights, probably.    
ACDR    ...    
CMP     Any two or three at various intensities, that's for sure.    
DMP     ...    
ACDR    Well, that's possible. ...    
CMP     Yeah. That is interesting.    
ACDR    That's my impression.    
19 07 44 CMP  Lets you know how - what colorband ...    
ACDR    3709.    
CMP     There it is. You're going to be in a good position.    
ACDR    Yeah.    
19 08 53 CMP  Now. Boy, that's beautiful.    
DMP     God damn! Near missed it, too.    
MS    (Laughter)
Okay. DSE - one time.

... 

Okay. ... STOP, ..., COMMAND RESET. Okay.

Yep.

It's in the STOP position ... COMMAND RESET is all that's needed to make the switch work. COMMAND RESET.

... 

... 

Yeah. That's exactly what happened. Must have been ...

... 

I'll tell you, Tom, I find - I think neither one of us should ... second can keep an interest unless we have some participation.

Yeah.

If one of us reads, the other one can do the computer work. I still - I think ... it would be better. That way, you have two guys checking.

... DSE, STOP.

Okay.

Okay. ...

Plus ..., plus 210, ... We only got about ...

Yeah, and X-ray. I can't think of anything we - we could have done to ... backup.

No.

We were mainly collecting urine and all that kind of stuff, and that probably showed up.

...
No way.
No?
STOP. COMMAND RESET. Right?
FORWARD. HIGH BIT RATE, RECORD. FORWARD ...
That makes me think ... I've got to find one that says this is rev 77 now.
I'll tell you what ... power ...
Fair enough.
Maybe you can see a sign or something. (Laughter)
Well, I'll tell you. I'm completely — I haven't the slightest idea where we are.
Hey, you don't think this is over the United States, do you?
I'm beginning to think so.
Shit, we've been ...
Huh?
...(Laughter)
... the States.
No, it's got to be the States.
DMP  It looks more like --

19 43 46 ACDR  There's Chicago, down in the south end I'll bet.

CMP  ...

ACDR  Hell, yes. And here's Detroit up here and -- over here's the --

CMP  ...

ACDR  -- the big airport. I'm sorry. I'm not ... right over the ...

MS  (Laughter)

CMP  I wonder where it was -- the things we saw. I can't imagine.

ACDR  That had to be ... coming across.

MS  ...

19 44 09 CMP  That was the lower part of Baja. That's what it was, sure as hell.

ACDR  Yeah, here's the great ...

CMP  Yeah.

ACDR  ...

CMP  (Laughter)

ACDR  ...

CMP  (Laughter)

19 44 49 CMP  Sure went across a lot of farmland. That must have been the Midwest.

ACDR  Yeah, it was, definitely. ...

CMP  I got to associate trees and cheese and stuff like that up there -- Germans. (Laughter)

ACDR  ...

425
Yeah.

Well, Tom had me talking ...

(Laughter)

You live like it.

Okay ... 42.

... 24 ... it says here ...

Apollo, Houston. We're AOS through Goldstone. Should have you for about 7 minutes.

Goldstone?

Okay.

(Laughter) ... 

Sorry. How about Newfoundland?

Goldstone?

That's better.

You had us shook up.

We've just been looking at Wisconsin through our spotting scope and across Lake Michigan where the clouds ...

... then.

Okay.

Any chance I can talk one of you gents that isn't too busy into digging out a pad for me? To improve our data a little bit on this upcoming rev 80 for EUV, we would really like to run the - one of the EUV contingency pads - or the EUV contingency pad for rev 80, which is buried down there in Alfa 2. Any chance somebody could sneak under the couch there and get it?

Just ... We'll get it for you.
ACDR: Well, I can take care of this, Vance.

DMF: ...

CMP: Yeah, I can get it. I can get it.

CC-H: Regarding that furnace, Deke. Don't we have - this kind of sample we've got in there - it's a little bit different from what we've been running, and we suspect it's just outgassing and it's going to take a little while for that pressure to get down. So what we'd like you to do is just to wait awhile on it and go back and check a little bit later and see if the pressure's dropped.

DMF: Okay. We'll do that. And so far as this freezer is concerned, I've had the cover off of that. There is a lot of frost on the plug. But the problem is - in the process of opening that thing, we've accumulated a lot of frost on the remaining samples and the bottom of the plug, and that's where our binding is occurring. ... back in and we're in good shape now. So I propose we don't take the lid out any more often than necessary.

CC-H: Okay. Understand the frost was forming on - -

CMP: Let's see, we got the high gain ...

ACDR: ...

CMP: We're not going to have ATS ...

ACDR: ...

ACDR: Nope. ...

CC-H: Apollo, Houston. We're AOS, Madrid. We have you for 6 minutes.

ACDR: Roger. Understand there's no ATS voice until 128:57.

CC-H: Affirm. In fact, we've even released the satellite such that you couldn't tune it in if you wanted to.

ACDR: Oh, really.
CC-H Yeah. We figured we wouldn't - wasn't going to need it, so we might as well let them - let them relax.

ACDR Will we have it on and off for the rest of the mission?

CC-H You bet. Just for this one rev that we've released it.

ACDR Oh, okay.

CC-H No, couldn't give up all this good voice and data.

ACDR Right.

CMP Oh, the satellite has other duties too, I understand. It divides its attention between us ...

ACDR DSE, STOP, COMMAND RESET. ...

ACDR Going to have ... 4420, we have ... obs. ...

CMP Yeah. That's what he said.

ACDR ...

CMP Want me to make you a drink or anything?

ACDR Yeah. Make out a strawberry drink or something like that.

CMP Excuse me.

ACDR Okay, Vance, DSE, STOP, COMMAND RESET.

CMP Right now?

ACDR Yeah. I'll hold that. ... I'll hold it. ...

CMP No, I'll get it.

ACDR STOP, COMMAND RESET.

ACDR You got any ...

CMP This kind?
ACDR  No, ...

20 15 21 CMP  I don't think they work. ... last one ... other ...
ACDR  Oh.
CMP  ...
ACDR  ... I've got some ...
CMP  ...
ACDR  ...

20 22 55 CMP  No, option 2, P20, ... take the VERB 48. The option - the other option ...

20 24 21 CMP  Well, it's not the most exciting type of work. Even when we're rushed on it it's pretty easy. ...
ACDR  ...
CMP  ... Like what?
ACDR  Like ...

20 26 17 CMP  About - that's 29. ... Okay. ...

20 43 00 CMP  You got enough?

20 43 51 ACDR  ... as you can see the ... has got to break up. No. It's not lightning. Did you get it all in the other big bag? Get it all in one big bag?

DMP  Yeah.
ACDR  All stuffed in one bag.

20 44 29 ACDR  Well, okay. It's either a 9-day mission or 5 full days or a 10-day ... We got 4 days ...
ACDR  Hell, Yeah. Yeah, yeah. We're over halfway. That one bag ... ground it in?
ACDR  ...

20 46 43 ACDR  Okay. DSE, STOP, COMMAND RESET.
21 02 07 CMP Oh, Deke? Just float it down. ...

ACDR ...

CMP Do you see any - anything over the North Atlantic?

21 03 00 ACDR No. ...

TIME SKIP

22 32 31 CC-H We've actually - If you've been going for as long as you said now on - on exercise, we've got an adequate amount. And we'll just go ahead and take - take the tape recorder and rewind it and set it up for our next pass. And you can do what you like regarding further exercise.

ACDR Okay. I'll go ahead for about 4 or 5 more minutes. You want us to rewind it or you want to command it?

CC-H We'll go - we'll -

DMP ... nothing there.

22 33 04 CC-H Rog. You can press on, and we'll go ahead and handle --

TIME SKIP

23 01 42 CMP Got it. Be over ...

23 01 47 ACDR Feels like - more like a ...

CMP Yeah. Seems like there's a lot of power ...

ACDR ... Oh, I'll get it for you, Deke. ...

23 02 03 CMP No. They cautioned us today. Don't forget, when the DSE's on - running ... comm. They're getting it better. I don't know why.

ACDR ... one ... Get this bag out. 16. ...

ACDR ... put this ... in.
I don't have it. I've got - I've got some other film but not that one, I don't think. Let me check. I got all the film. Let's see, 5, 9. 3 came out of here. I do have them. The mag here, is 16, 17. I can shoot you one of those. Here's infrared, IF; you can have one of those if you --

Well, where are we supposed to be now according to their charts. Where should we be on the mags?

Okay, Deke. Here's 16 - coming at you.

... You got a pen?

Today is ...

I wonder if some of these things ... put back here.

... Oh yeah.

What about these ... that still have about 20 left on them?

Yeah.

You know, some of these still like ... still have about 30 exposures ...

What is that, mapping?

Yeah.

What kind is it?

This one's all out, here.

... STOP the DSE ... STOP, COMMAND RESET.

Apollo, Houston. Ascension for 4 minutes.

... Yeah, I'm ... having trouble.
ACDR Oh, hell. No wonder. He didn't have his slide[?] up.

DMP ...

ACDR Put the slide[?] up.

23 09 35 CC-H Apollo, Houston. Ascension for about 3-1/2 minutes.

DMP ... reading you Crip [sic].

ACDR Let me try it. I've already got this ...

CMP Yeah.

23 09 43 CC-H And I've got a update to the upcoming P20 for this Earth obs attitude, Deke, if you'd - if you'd like me to update that Flight Plan.

DMP Okay.

CC-H Okay. It's at 131 hours and 15 minutes.

CC-H ... ready to copy?

23 10 10 CC-H Okay. NOUN - there's one change. The NOUN 78, VERB 7 - VERB 25, NOUN 78, I want to change the middle number to read plus 06000. And that'll end up - the three numbers will be plus all balls, plus 06 three balls, plus 18 three balls. Over.

DMP Okay. Copy.

CC-H ... you copied that, due to the data that we see here on the experiment, Vance, from the X-ray, we got a - a change in the pad we want you to do.

ACDR Got it.

CMP Okay. Go ahead.

CC-H Like - Okay. We'd like X-ray H - HIGH VOLTAGE POWER to OFF, now, down on panel 230. And I've got one write-in for you at 29 minutes.

CMP Okay.
And ... just write in there, "X-RAY HIGH VOLTAGE POWER to number 1 at 29 minutes." The rest of the pad remains exactly as is.

Okay. Part of your "save the wear and tear" program?

No. Tell you what it is, we don't think we're getting good data on the X-ray. There's a very important target down there at 29 minutes. We're going to turn the HIGH VOLTAGE POWER, OFF now, and turn it back to number 1 at 29 minutes, and the rest of the pad will make it all work. The reason we're not changing any of the interim part of the pad is we're also getting U-EUV data. Over.

Okay. Understand.

You want to turn your X-ray --

Right.

-- off now?

HIGH VOLTAGE POWER, OFF. Just -- just HIGH VOLTAGE POWER, that's all.

HIGH VOLTAGE POWER, OFF. ...

And at 130 plus 29, we turn it back on again. Okay? No it must be 131.

... tape. ...

Yeah. I think we ought to find where we are. And I -- I can't --

Apollo, Houston. We're about 30 seconds from LOS. Orroral Valley comes up at 131 plus 22. See you there.

Okay. See you there.

Thank you, Dick.

Nikon.

You find it?
It's set up for doing ...

Okay.

... the only thing you got left in here ...

Okay. DSE, STOP, COMMAND RESET. ... on COMMAND RESET.

Okay. Okay, then ...

Okay.

... It's ... on the ... stuff.

Oh, okay.

... I think it's going to be okay.

Where's the - where'd we put that - that quick release stuff?

Pardon?

Put all that quick release, 16 millimeters ... Nikon down in A-5. And tell them where ... some Hasselblads.

Yeah, there was just two - two Hassa --

Hasselblads.

-- two Hasselblads down in A-5 also.

Two Hasselblads ... Well, we got the ... on them ...

So for Farouk's stuff, compared to ... how many do we have now? ...
D.A.Y 202

00 29 13  ACDR   ... call them on that.
ACDR   Houston, Apollo.
CC-H   Go ahead, Tom.
ACDR   Okay, Dick, down in this - again in this same area - about 32:34 - it says, "Activate primary evaporator." They still want us to leave this one off, ...?
CC-H   That's affirmative. Delete that there where it says "Activate primary evaporator." And that's the last one of the day. We're going to leave it off.
ACDR   Okay. We're going to leave it off all night, huh?
00 29 39  CC-H   That's affirm. We're about - and, Tom, we're about a minute from LOS. Ascension comes up about 10 minutes from now at 132:19. See you there.
ACDR   Real good.
ACDR   Give Deke a Hasselblad.
CMP    There you are.
CC-H   And, per the pad, we'll probably get locked up on ATS before we get Ascension.
00 29 59  ACDR   Roger.
00 31 44  CMP    ... have Ascension?
ACDR   10 minutes.
CMP    Well, resolved that one. ... 
ACDR   ... Oh. Yeah, ...
CMP    I think ...
ACDR   ...
CMP    ...
ACDR    Passed the ...
... you have ... there.

I got one of it.

I got one after that.

Good.

On all those great pictures ... I want to ask, you know, if we can shoot that up.

Yeah, that's - that's one for us.

Deke, here's your ...

That's true - PAO quick-release numbers, right? That ought to give you ...

Yeah.

Okay; give me more ... couple of ...

Turn it on ...

Turn it on?

Ah, yeah.

Okay, and the next one will be VERB 49. ...

Any idea? I guess it's the fact that ... ... 50?

Okay. It hasn't been ...

Yeah.

Fine. I have a big stack of 16 millimeter on Nikons.

Yeah.

No, in 85, 85. It hasn't ... store that stuff ...

Okay. Here's the next one.

Yeah, there should be a - See that big stack there apart from PAO? That's the 16 ...
ACDR  Almost got to ... every ...
CMP   VERB 49 ... 02.
ACDR  ... We can kind of shoot it ...
CMP   ...
ACDR  At 180 miles up ... here and staying ... NOUN here has got to be ...
CMP   Okay. ... ENTER. And a VERB ... 49 ENTER ... 117140 plus 075.
ACDR  Pardon me ...
DMP   Hey, Vance, ...

00 54 16 ACDR  Oh, we got the ... on the ... in there ...
CMP   ...
00 55 19 ACDR  Hello, Houston; Apollo.
00 55 46 CMP   All right.  MARK.
00 55 51 ACDR  Houston, Apollo.
CMP   ...
00 56 37 ACDR  Houston, Apollo. How do you read?
CC-H  Apollo, Houston. We read you loud and clear.
ACDR  Okay. Are we locked up on the ATS?
CMP   I'm sorry.
00 56 49 ACDR  Okay. I'll go ahead there and go to the STOP, REWIND, and ...
00 56 55 CC-H  Okay.

TIME SKIP
02 01 24  ACDR  ... again.
02 01 57  CDR  Okay. UP TELEMETRY ... DIRECT.
ACDR  ...
CML  Yeah. ...
02 05 08  CMP  EUV ... STOP, COMMAND RESET.
ACDR  ..., huh?
02 05 15  CMP  Yeah. Right now ...
02 10 46  CMP  ... plus 34 ... 
DMP  Plus ...
CMP  Plus 17. Plus 317.
MS  ...
02 11 12  CMP  Yeah?
DMP  It's pretty important.
02 11 17  CMP  Oh. Well, that's - yeah, sure.
02 11 30  CMP  Not yet. ... hit the control. ...
DMP  ...
02 11 39  CMP  Yeah. We'll wait ... Yeah, we ...
DMP  Yeah, let's go. 33 ...
CMP  It's ... go ahead.
02 11 56  DMP  That's right.

TIME SKIP

03 07 41  CMP  Anyhow, we're going to be just beginning rev 80 -
... - it'll be about about - 15 minutes. Rev 8 ...
TIME SKIP

11 13 06 CC-H Minus 7 and 323.
ACDR Okay. And we'll check on how our water boiler's doing ...
CC-H Just as we go over the hill, why, everything looks fine. We still have live TV from the Soviet Union - Kazakhstan, where the spacecraft has landed. And we saw it touch down. Cosmonauts got out and everything looks good.

DMP Well, must have been a pretty good landing.

ACDR Vance? Something's wrong. They had the TV live and saw the touchdown. If they had live TV on their touchdown, they must have ... the hell out of their landing.

11 17 38 ACDR We got a 9-minute water dump ... 43:15.
ACDR How's the docking module? Cool up there? How's the ... look?

CMP Not bad.

ACDR Not bad ... For one time, I hope ... Where's the latest? Okay, we got ...

11 18 26 ACDR Deke, while you're there, how about giving the high gain angles? Minus 7 on pitch and 323 in yaw.

ACDR ...

CMP What?

ACDR ...

11 20 52 CMP Go ahead, Deke. Go ahead. Yeah, but ...

CMP Okay. VERB ... CMC Mode. ... Option 5 ... that's 143:04. Okay, option 5 ... Let her rip. ...
ACDR Okay.

11 23 36 CMP You got all of these jet monitors ...?

11 26 24 CMP Oh. ... first chance to dump that thing, huh?

11 26 24 CMP Okay, ... pressed for it. But, hell, ...

11 26 24 CMP Here, I'll take it, Deke.

11 26 24 CMP Okay. Deke, see what you can do.

11 26 24 CMP Find it?

11 26 24 DMP Hey, this is plus 28 ...

11 26 24 CMP Okay, then we can mark that off as okay? Okay.

11 28 20 CMP Next, there's - HRC, CX15 and IFO2.

11 29 59 CMP Okay. Tom - oh, yeah. CX15. And it needs another one, then.

11 29 59 CMP Okay. Yeah. All right. IRO1 and IRO2.

11 29 59 CMP I'm on SERVO. I -

11 29 59 CMP Okay. It was IRO1 and IRO2, so - Yeah. Oh, wait a minute - Ul, Ul.

11 31 36 CMP Okay. And I'll check it. ...

11 31 36 CMP 51? ...? I can follow the -

11 31 36 CMP Okay. I don't see any, yet. I think they're in the - Okay.

TIME SKIP
... big chute. Coming down, you know, it looks kind of like a diving bell. And just before they hit the ground, there was a big cloud of dust. Must have been when the rocket fired. And then the dust blew away, and they settled down quite - looks like quite nicely. When the people got to them, they got out and stood up, and both of them waved. And so they looked like they were in good health and good spirits.

Sounds great.

And we're just about going LOS here.

And, Deke, you get to do your thing with the electrophoresis today?

I didn't copy that, Deke.

Huh? You didn't. I copied the ending. ... I remember thinking --

Right over there.

Right there.

... C and D ...

I got to ...

Yeah, 88. Getting up there, man. Wonder where's ... Mission will be over before you know it. Right. That's hard to tell. That's right. But we got to savor the last 3 days here.

The light is coming on down to ... Okay. Why don't you - Huh?

... 10 days?

Yeah.

Hell, if we start leaving the VTR off now, we might last 12 to 15 days.

Towel.
B-5, I think, Tom. It's not? I'll look it up in the Supplement and see where it is.

They were supposed to be in 5.

Why don't I look in the Supplement now while – Deke, you looking for a towel?

And there's none in here now.

Okay. Let me – let me grab the Supplement …

You putting the Nikon stuff up in F-1?

Yep.

All tissues that came were in A-1.

All tissues?

Yeah. Well, except I don't believe that should be. No. Sorry. Oh, A-2, also.

A-2, huh?

Yeah.

Oh, okay.

Yeah. A-2 and D-4. There should be some with the docking module. Only thing is, we'll probably have to ration them. Now, towels. What the hell do they call towels? I guess they are called towels. Here they are. Towels are in A-1, A-2, and D-2. So, you got both in A-1, A-2, and D-2.

Yeah. Huh?

… that's … towels …

Take that paper from back of the hand controller.

Would you take down those towels? … air conditioner … water.

I've got to …
ACDR... got it. Battery's dead? ... got a dead battery.

CMP Yeah. Dead battery. You about ready to go? Go down and get ...

ACDR How about ...

CMP How much time you got?

ACDR 12 minutes. ...

12 41 00 CC-H Apollo, Houston through Vanguard for just a little over a minute. Santiago at 14:37.

ACDR Roger, Bo.

CMP Let's see - the batteries are in A-5, aren't they?

ACDR Yeah.

CMP What kind of a thing are they in? I've forgotten.

ACDR ... you did? They're - they're right here. ...

CMP The ... are still with ...

ACDR Yeah.

CMP You're sure they're in A-5, huh?

ACDR ...

CMP Could be A-6.

ACDR Could be A-4.

12 42 08 CMP A-4?

ACDR No, I don't think, but we can check. No, I think A-5.

CMP Batteries, A-5?

ACDR Yeah.
Okay. Book says that, huh?

ACDR Yeah.

Oh, hell, I think the batteries are in A-4, too.

Okay; we're going through ...

It says ... jet engine ... being cut off ...

Deke.

Yeah.

Here's the battery.

Oh, okay.

Hey, maybe we ought to replace 2. Well, I guess we shouldn't replace it.

...

Okay. We're upside down going forward. Those valves are to your left. Upside down to your left. If you're right side up, valves are to your right. Upside down, valves are to your left.

I'm going to need some help on this.

...

Got a towel ...?

Is the Hasselblad ... the Nikon camera bag?

... that way before. ...

Right.

What we better do is ...

I don't think so.

Why?

Because we got a couple of ..., and I don't know about ...
I was going to put another ... back in the rear ... back there for ...

You guys ...

You mean one guy kind of handle things?

... like I got a ... See?

Yeah.

...

You gotta be quick because it'll make you or break you.

Right. ... Good way to get things done.

There's a lot of wording to ... with regards to the ... I mean on the job, of course.

Got a ..., Deke?

I'll see.

Then what do you need, Tom?

I'd like to wipe that window better ... And a napkin isn't ... I was trying to find that ...

How about a Kleenex?

... Kleenex ...

...

It took me five, and I didn't see any problem there.

... I had a pack ...

Yeah, I could use one towel out of that, too.

Okay.

Oh, shit.

What?
CMF  I've got to get a P52. Better hurry up.

ACDR  Water?

DMP  Yeah.

CMF  I wonder how much time I got.

ACDR  Okay. 27. You got about 5 minutes ... hour ... option 3.

ACDR  Let me have one ... Got the ...

CMF  Yeah, they left a ...

12 51 13  CMP  Oh, okay, Deke. Appreciate it. Thanks.

ACDR  You ought to take one of those ... they got ... in the LEB ... towels ...

ACDR  Okay. This is rev 88. Starting the Earth obs at 144:30. Sites 8B, C, D, and E ... again?

DMP  Yeah.

CMP  Aah, Deke, in a minute, I'm going to need CMC, FREE. Well, maybe I can get it.

ACDR  I - I'll get it.

12 52 06  CMP  Can you get it? Not quite yet, but in a minute.

ACDR  ... in the background?

CMP  Yeah.

DMP  Let's see if the ...

CMP  Okay.

ACDR  Okay.

CMP  All balls.

DMP  Okay.

CMP  And did you ...?
Okay. Have you got the torquing angles?

14.8, minus 18.7, minus 12.8.

Okay. I'm going to torque it.

MARK at 144:31:00.

That torque?

Yeah.

... CMC, AUTO. What were your stars?

06 and 15.

Sure, huh? ... back up ... Nikon. ...

Okay. Tom, would you leave those free for a second? I'm going to have to get back into a plain old P52. I'm not sure what the Flight Plan says to do. I've ... Okay; I've got to go to 20; that'll do it.

Okay. I'd better go back to AUTO then.

Not yet - not yet. Just a second. I don't want it to stop in the middle.

Okay. I think we're all right. We'll go 58.

MODE, FREE.

Okay. Go back to AUTO.

Okay.

Okay; to 58. ... maneuver.

Okay.

Got to go down to a pitch 72. Let it - let it fall off.

Okay ...
OMP Okay. Hold it.

ACDR Vance. Vance, did I ever tell you --

CMP Okay. So much for the P52.

ACDR Why don't you ...?

CMP ...

ACDR That's what I need to do ...

CMP They got this dune field?

ACDR Here's this dune site at 144:28.

CMP Where - where's the --

ACDR ... colors.

ACDR Right here ...

12 57 37

DMP You're all set.

ACDR Let's see, ...

DMP ... Check it and see if you see it. ...

ACDR What rev?

CMP What rev? 88. We're just starting 88. We'll have to get the LiOH.

ACDR ... down here.

ACDR ... I'll get it.

12 58 44 ACDR Oh, Vance, flip the HIGH GAIN angle. What they want is a minus 4 and 312. HIGH GAIN angles, minus 4 and 312.

ACDR ... Sure is ...

DMP Yeah, I can. I put it there because ... somebody else.

13 00 16 ACDR Oh, fuck! I wish ... this goddamn machine off.
DMP Do what?

ACDR Fuck the damn ... Sorry that we have to put up with ...

DMP Here's the long river running north to south. It comes up around in here. What direction are we going in?

ACDR There's the river site. Okay. ... 44 and 48.

DMP 44 and 48.

ACDR Yeah.

ACDR No, that isn't ... yet.

13 01 11 DMP 44 and 48 ... Look at that highway down there. All I can see ...

13 04 40 CMP ...

ACDR ... here's one on ...

CMP ...

ACDR ...

CMP No, that is the ...

13 05 40 ACDR Look at that ... down there ...

TIME SKIP

13 40 45 CMP ... other one.

ACDR 5.

CMP ...

ACDR ...

13 41 21 ACDR 66630[?].

CMP ...

449
Hey! There's a hell of a river. Wonder... --

I think that's... Oh, yeah.

... from here.

Look at those... ... Yeah, we're going over... right now. ...

... stop.

Yeah, we're right in through them... ...

-- ... said we're going over just the start of it. Might not be --

What's the...? ... Going through... Hell, we're going to go right over China. Look at..., all those...

...?

Yeah. ... turn it on.

Yeah, right.

Yeah.

... I just put it down there.

Okay...
ACDR ... 
CMP Think it's ...? 
ACDR Yeah. ... 

13 44 59 
CMP Okay. 
CMP Ready for you guys, but I haven't been ... down ... 
ACDR Yeah. ... 

13 45 24 
CMP Okay. Stand by - do it. 
CMP Well, it's dark. 
ACDR Okay. 
CMP Okay? 
ACDR ... 
CMP ... the whole thing. HIGH BIT RATE, RECORD, ... and - 
CMP Ah, man. What a tremendous experience. 
ACDR ... 
CMP It is now? 
CMP Okay. 
ACDR Okay. 

13 47 21 
CMP Ready, start. 

13 47 23 
ACDR RECORD, HIGH BIT RATE, (sneeze). ... 

TIME SKIP 

14 21 26. 
CMP Looks like you've got a regular kitchen over there, Deke. You didn't get your breakfast yet? 
CMP Let's see. This first one there ...
... Can I help ...? Do you have ...?

Okay. ... Can't even touch ...

Okay.

TIME SKIP

Yep.

Ready?

Right.

Okay. VERB 49 ENTER - VERB 41 - plus 168.30. Maybe we ought to do that ...

She ... like a robot.

Yeah.

35. Okay. VERB 21 NOUN 46 ENTER.

Apollo, Houston, talking at you through Orroral. Got you for a little over a minute.

Okay. 61102 ENTER. VERB 46 ENTER. Okay, we're going to get out ... 49 ENTER VERB 44 ENTER. Plus 167.40, plus 278.40, 20 seconds.

Roger. Reading you weak, Crip.

Okay, fine. I've got you loud and clear right now.

Apollo, Houston. If you read me well enough - Well, we're just about to go over the hill right now. We'll see you at - at Quito in 30 minutes.

Okay. Anything you need real fast?

I was going to give you the DET time to count it to on rev 90, which is over on another - the next page here of 148:23:01, if you want it.

148:23:01. That was 148:23:01, right?
That's affirmative.

Got it.

Okay.

That's when we start the next one.

Deke, there's lots of noise down there. Someone must be working.

Oh, yeah? Okay. I want to stand here until you get a dump. ... 

That's correct.

... 

Ours ...

Should we renew our ...?

Yeah. Yeah, this little thing here that you hold at arm's length? One way to design it would be so that ... your eyeball ... back here, not back there.


Okay. Stand by -

Go.

... ENTER. 

Okay. ENTER. VERB 49 ENTER, VERB 21 ENTER. Plus 173.40. ENTER. ... 

I'll be able to work in a minute.

ENTER VERB 21 NOUN 46, plus 61102, 46 ENTER. VERB 49, ...plus 17 - plus 178.20, plus 250.00. ... 

Hey, would this be known as the ETE camera bracket?
ACDR ... A-6.
CMP Hey, Deke, the ETE camera bracket's in A-6.
DMP ...
CMP Okay.
ACDR Hold on just a minute ...
CMP Okay. We'll be through in a minute and we can help you.
ACDR ...

15 48 42 CMP Beautiful timing here. VERB 21 NOUN 46 ENTER.
          61101. VERB 46 ENTER. Okay. VERB 49 ... plus 181.20.
          33:30 ...
ACDR ...
CMP No.
ACDR I thought you were going to check this one out.
          ... Yeah.

15 50 19 CMP ENTER, VERB 49 ... ... you got to wait for this one.
ACDR ...
CMP ..., right?
ACDR ...
CMP ... GD.
ACDR Find it?
CMP Yeah.
ACDR This - this is another ...

15 52 03 CMP Did you find it? Did you find it, Deke? Yeah.
ACDR Did you find it?
DMP Yeah. ...
CMP Okay.
ACDR  HIGH BIT RATE.
CMP  No. LOW BIT RATE, RECORD, and FORWARD. ...
ACDR  ... LOW BIT RATE?
CMP  RECORD, FORWARD, COMMAND RESET - COMMAND RESET, I mean.

15 53 34  ACDR  LOW BIT RATE, FORWARD, RECORD - COMMAND RESET.
CMP  Right.
ACDR  Roger. Let's go back to the last one.
CMP  ... It kept going until here, and then apparently it just wanted to change LOW BIT RATE. ...  

15 54 01  ACDR  Powerdown.
ACDR  Okay. Next wonderful thing on today's program is to make ... pictures. Remember that your attitude ... 
CMPO The time is 47:32. Okay, ... 49 ... 25 ... plus 210.90 --

15 55 10  CMP  Oh, shoot! Did you know that was 060.5? 
ACDR  No ...
CMP  ... first. Okay, you were the first one --
CMP  Plus 210.90 --
ACDR  (Cough)
CMP  Okay. Plus 060.50.
ACDR  ...
CMP  ...
ACDR  210.90, 060.50.
Yeah. Now, I think, activate the PRIMARY EVAPORATOR. ... this is where we do the ...

TIME SKIP

All right.

I just have to really watch that electrophoresis.

Yeah, I know.

...

Yeah.

Yeah. I think we have. Crip said he'd send you ... shortly.

Crip, ...

I guess he's gone.

I've still got them.

...

Verify tape going to gray.

...

VERB - VERB 21 NOUN 46 ENTER. 61101 ENTER. VERB 46.

Okay. I need ...

...

Yeah. That's what I said. ... What f-stop?

...

Yeah.

...

Yeah. I'm running it FAST FORWARD ...
What's ATS doing besides working with us? Working ...?

Yeah. But I don't know if it is during this 10-day period.

That's what I was wondering. I just can't think of anyone else ...

Birth control education - Man, if they could do that and help India - it would be worth something.

That's right.

Okay. ENTER and VERB 49 and VERB 41. Plus 197.30.

... 

... 

Okay.

You know, if India doesn't get their own population under control - that has signs of being one of the conventional hot spots of 30 years from now.

Yeah. Look at all this desert we fly over.

Yeah. Right, right.

That's - there's only so much arable land - and unless you have a way of really taking all that seawater and ... there's just so much the area will support.

Yeah.

Well, you have to be awful thankful for the climate the way it is in the United States. ...

There's so damn little really good land in the world, it's surprising.

We've fucked up.

Okay, coming up to 45. And a Jupiter. ENTER 49 VERB 21. 194.30.
... exercise, a little ashamed ...

ACDR One more ...

CMF Fine. ...


17 18 58 ACDR You know one place that's fantastic but hasn't ever been touched as far as land ... agriculture ... They have great forests.

CMF Yeah. But they're not really too good for agriculture, are they, Tom?

ACDR Huh? I don't know.

CMF I think the land gets leached.

ACDR The land gets leached, huh?

CMF Yeah.

ACDR ...

17 19 25 CMP That's why they have that policy of slash and burn down there. They'll slash out a section of jungle and burn it, use it for, as Deke said, 3 or 4 years. And then if it's no good, they've got to go slash and burn another patch.

ACDR I'll be damned. I didn't know that.

CMF If you put fertilizer on it, it'll wash away after the first couple or three weeks.

ACDR ...

CMF Yeah.

17 19 57 CMP See if the other side is better.

ACDR Okay.

ACDR Do I have a one-size ...?
ACDR Yeah, what ...
ACDR Looking at what you've got here. ...
ACDR ... pick up this ...
CMP ... both of them.

17 21 51 CMP Okay. 37 coming up. And we just - all we do is get ENTER and - now. And we get - at 37, LOW BIT RATE, RECORD, FORWARD, COMMAND RESET.
ACDR LOW BIT RATE, RECORD, FORWARD, COMMAND RESET. That right?

17 22 12 CMP Right. And then, in addition, power down EUV.

17 23 08 ACDR Okay, it's set.
CMP Okay.
CMP I wonder what they've done here? CSM ... the book. The bottom ... I don't understand that. ...
ACDR Do you go to the Flight Plan for the rest of it? ...
CMP Okay.
ACDR ...

17 23 45 CMP That's good. ...
ACDR 00000 ... wind up with ...
CMP ... you sure?
ACDR ...
CMP Well, that's good. ...
ACDR ...
CMP Okay. ...
DMP ...
ACDR That's the first set. The timer reads zero.
Okay.

We also have Doppler. ...

Hey, Deke. We got the tester down in that corner. Verify cabin vent QD on - installed.

Okay. What's this? ... Oh! Okay.

... There's the big ... for you, Deke. I bet you've got a lot of -.

... Do what?

... Yeah, I can try to do it, Deke. You got more important things to do. What's it - what's it supposed to be set up on?

... Oh, I see.

... Yeah.

Now, what are their recommended settings?

... settings ... cue card ...

Oh, the cue card, huh?

About - -

...
Then you're all set up ...

... 

Oh, yeah.

Yeah. Oh that's great; behind you ...

Okay. While Deke is ... that's okay.

Right there.

Yeah. ...

...

No - Yeah.

Okay. Well, ... Deke.

Oh, yeah. Yeah. Let's see, if we wanted to ... that would be ...

Yeah.

That would be ...

I haven't either, but I have ...

Yeah. Sure the hell do. I think that ... Well, after ...

...

If you - get a chance, show me where that Adriatic thing is, so that I know ... don't bother. ... help out on that.

Okay. ...

And I'll be down ...

Okay, you can start up there.

That all?

Are you ready? ... What part of it ...? ... part.
Okay. I think - Let me try to ... myself better.

Yeah.

... Deke.

Okay. I didn't check ...

... 149:19 ... 149 ... we're ... we're coming ...

Okay.

Okay ... talking about ...

... almost made it.

... Right.

... got it stopped, I think ...

180 degrees.

... got ... upside down.

All right. Hit it. ...

Okay.
... the primary is concerned.

... right below you. It's coming in. It may come in for you. I don't know. But it'll pitch it over.

Okay; thanks.

Yeah.

... little problem here. ...

TIME SKIP

... star 13 ... I just had it there.

... 

Yeah.

Tom.

This one?

Yeah. I just got to wash off this one. ...

... 

Say - they didn't have any ...

Guess it's cooled off.

... 

Well, I don't know. I wrote in, to ... Was this the same as --

I don't know. That's --

... 

Okay. ...
- second bag, the one that has the eggs in it.

Yeah. Got it. ...

Okay. Have you noticed any - any hatchings yet?

Well, ... yesterday, but I haven't looked at it today.

Okay. We're about ready to go over the hill here and we'll see you at Goldstone in 15 - 15 minutes. And we'd certainly be interested in hearing it when you take a look at it - whether we get any.

All right.

I've got them ...

Okay. We're in A ...

Okay. It's probably ... down there ...

Yeah, that one.

...

Right there across from you.

...

Yeah, that's where it - ...

The problem is ...

...

How about this ... here?

I don't think that ...

Yeah. I hope you're right ...

Well, I tell you what ...

...
ACDR: Is that better?

CMP: I'll say this, then I'll ...

ACDR: ...

DMP: Go ahead.

19 09 18 ACDR: Do we have to lock up this -

DMP: ...

CMP: ...

ACDR: That ... instead of popping around.

USA: ...

19 11 19 ACDR: That was just your ...

CMP: ...?

DMP: No.

19 14 09 ACDR: I'm wondering ...

ACDR: ..., Deke, you got all that ...?

ACDR: Yeah.

ACDR: I didn't hear it. Through here?

19 16 40 CC-H: Apollo, Houston. We're AOS through Goldstone. We have you for about 2-1/2 minutes.

ACDR: Okay, Crip. And another master alarm came on as far as the light on it ... configure my headset. The whole panel is clear.

19 16 55 CC-H: Okay, copy. You got an MC&W -

19 18 42 CC-H: - at 150:25, we need you to go ahead and get that in, so we'll be set up for the next helium glow. Also, we'll get you on ATS.

ACDR: ...

19 19 08 CC-H: Recommend you increase your DAP to 1/2 degree per second for this maneuver.
ACDR 1/2 degree per second, what's the ...? ... DAP by 1/2 degree.

DMP ...

ACDR About 30 minutes ... go. ...

DMP Okay, Houston. ... make it ... Hold it.

ACDR ...

ACDR Okay. We got ...

ACDR Okay. Now what angles do we have to lock up?

19 20 39 DMP Okay. Minus 35 and ...

ACDR ... We're going across the Midwest.

CMP ... we've gone to far ...

ACDR ... we're on the Midwest ... interstate highway. See that interstate highway right down below?

CMP It may even be Oklahoma.

19 21 50 ACDR Yeah, that's Oklahoma City.

CMP I think it is. See that's the lake ...

ACDR ...

CMP It looks like Oklahoma City. I think it is. ... (Laughter)

ACDR ... just put it right there, Deke.

DMP ...

ACDR Yeah, that's too bad. Man, that'd be - that'd be ...

DMP ...

ACDR ...

CMP ...

CMP ... that's right.
ACDR

CMP Yeah.

19 26 18
ACDR Deke, the high-gain angles for the ATS.

DMP You want them?

ACDR ...

DMP ... 35.

CC-H ...

19 26 28
CC-H Apollo, Houston. We are AOS through Newfoundland. Should get you with the ATS about 51 minutes.

ACDR ...

CC-H Okay. I heard you call back down, but it wasn't very clear. If the comm's not going to be too hot here through Newfoundland, we'll - we'll wait until we get ATS lockup.

CMP Heard you loud and clear ...

CC-H Okay. Reading you the same, now, Vance. One item I would like to go ahead and pick up and get out of the road is for the upcoming helium glow pass; I need to give you the times and a couple of deletions on that. That's rev 92/93 in your Supplement.

CMP Rog.

ACDR ...

CC-H Okay. If you're looking at it, for - we want to set the DET counting up to 151:36:36.

CMP Okay. Helium glow pad ...

CC-H Okay. That's a good readback. We would like to delete X-ray from - from this pad entirely. And we would like to use, on our EUV ops, detector 2, vice detector 1.

CMP ...
CC-H: I'm sorry, I said that backwards. We want to use detector 1, vice detector 2.

19 28 22 CMP: Okay. ...

TIME SKIP

19 58 59 CMP: Okay. That's the fast ... do it.
ACDR: ...
CMP: Okay.
ACDR: That's why ...

19 59 38 CMP: How we doing on the old Flight Plan? Got the WASTE STOWAGE VENT valve CLOSED?
ACDR: Yeah.

19 59 46 CMP: ... Experiment Checklist ETE freeze. ..., Deke?
DMP: Yeah. ...
CMP: Okay.
CMP: Furnace, MA ... How about that?

20 00 17 CMP: Yeah, okay. Unstow pulser and MA ... samples from A-6. And DM Checklist furnace shutdown. Coming up. Get that? Coming up.

CMP: And we're waiting for 6 minutes. That little timer is being used down below, right?

20 00 56 ACDR: That timer is somewhere in the spacecraft.
CMP: Oh.
ACDR: ... I heard it go off. ... right time. ...

20 01 14 CMP: Amazing how you can ... zero-g. It was ... DET.
ACDR: What was that?
20 01 59 CMP That's because we just loaded in the --
ACDR Oh.
CMP Want it in 4 or 6?
ACDR 6 ... says here. ... can you hand me back the pads? ...
CMP ... we get to the next thing after this ...

20 02 57 ACDR 12.1 ... Start the ... ops. ... about 154:30. Look in the Flight Plan at 154:30. ... got anything else ... He's got his SAM installation and calibration.

20 03 30 CMP Thing is I could probably correct ... will be attitude ... It's going down into 2 minutes.
ACDR Okay. Well, it's got to ... before that. Have to shut it off, close the - you ... on open.

20 03 48 CMP First half of that pad ... over here ... The last part ... the one attitude. ... switch ...
ACDR ... You got a bunch of SAMs coming up ...

20 04 24 ACDR Oh, it's reading about 64 minutes.
DMP 64. ...
ACDR Yup.
ACDR ... came up ...

20 04 47 CMP ... up here so I can check ... Load VERB 25 ENTER, 148.00. STOP, COMMAND RESET.
ACDR Yeah. ...

20 05 10 CMP Yeah.
(Music)

20 09 15 CMP ... Oh, yeah. ... Okay, 49 from this pad ... pad. Oh, okay. I'll just put this away and I'll get out ...  
ACDR Those are big log books, huh?  
DMP Yeah.

20 10 01 ACDR Okay. I'll back you up on it.  
CMP When do we pick up Crip? Vanguard?  

20 11 25 CC-H Apollo, ... Orroral ... Vanguard. ...  
CMP Roger. How long did he say?  
ACDR ... minutes.  
CMP Okay.

20 12 23 ACDR DSE, STOP ...  

20 29 00 CC-H Apollo, Houston. If we could, we'd like to get an update on the furnace. According to our Flight Plan, it should have been shut down, and we show it still powered up. Are we running a little bit behind here?  

20 29 12 CMP Do you know what the status is?  
ACDR Deke's up there working on it now.  
CC-H Okay; fine.

20 30 56 ACDR You got some ... the checklist?  
CMP Yeah, I guess there's really not much for you to do here.

ACDR Why don't you go check on ...?  

20 31 13 CMP Hey, Deke?  
DMP Yeah.

20 31 15 CMP The ground said they still saw the furnace powered up. They just wanted the status.
POWER to OFF.

Deke, and should I tell them you're finished up?

Yeah. ...

Okay. Very good.

Apollo, Houston. We are 1 minute from LOS. Next station contact will be through Goldstone. That's about 15 minutes away, and it'll be at 152:25. 152:25.

Okay. Real good. Thank you, Crip.

Hey, Crip. Deke says the furnace is off now, and he's doing prep for MA060.

Rog. In looking at how we got here, I guess we look like we were just dominoing down from the fact that we had that problem on the ETE with the temperature, and I think everything's just running a few minutes late. We understand it.

Okay.

...

No, they just wondered.

What kind of a sample is that?

That's a --

Oh, yeah.

... STOP, COMMAND RESET.

No, you still need - Okay. I thought you didn't --

I'm sorry. ... STOP ...

Okay.
Okay. On the camera stuff.

DMP
Okay.

Apollo, Houston. We're AOS Goldstone for 6 minutes.

ACDR
Roger. ...

ACDR
Okay, Deke. You've got a little more than than 30 minutes. Okay?

DMP
What?

I got you coming up on 30 minutes.

DMP
Right.

Did you need the cable? Shall I disconnect the cable here? 'Good. That'll save room, probably.

Why don't you stick a piece of tape on each ... ... and tell them which one was bad.

Okay. I'll put a piece of tape on this saying "bad."

While you're here, you want to set DSE, STOP, COMMAND RESET?

Okay.

Apollo, Houston. We're AOS Newfoundland for 7 minutes.

Roger. I understand we don't have ATS ...

That's correct.

Yeah. Yeah. Right.

... ...

Yeah. ...

Houston, Apollo.

Apollo, go ahead.

... data looking good on us?
21 01 06 CC-H We're looking at you through Newfoundland right now and - which means we're only talking and not looking, VHF only, ... have data. Up until this time, it had been looking good.

ACDR Okay. ...

CC-H Rog. It looks like you're really having fun sitting there punching the DSKY.

ACDR ... new fingertips ...

21 01 26 CC-H Roger that. Take care of all fingerprints.

ACDR Right.

ACDR Vance, ... tell them ...

CMP Yeah.

ACDR This ...

21 02 09 ACDR Hello, Crip, Apollo.

CC-H Go ahead.

ACDR ... if I had a penny for every DSKY stroke, we could have a hell of a splashdown party, couldn't we?

CC-H Well, that's (laughter) that's certainly a good idea. I think we should have one anyhow.

ACDR Oh, we will.

21 02 25 CC-H A little - little side information. After I give this mike here to Dick Truly, I'm going to go over - We're having a little touchdown party for the - for the Soyuz tonight.

ACDR Oh. Real good. Sorry we can't join you.

CC-H Oh, you can have a little orange juice or whatever you got onboard there.

21 02 47 ACDR ...
... what the hell was that?
Something shook ...
If you want to look at Systems Checklist 1-33, you might run through a C&W check.
Say again.
... Checklist 1-33.
Roger.
... allow you to check it out, if you'd like.
Systems Checklist 1-33; check for caution and warning ...

Systems Checklist ...
That's just a standard C&W check, I think.
We've got to get on the ...
... Yeah. All that is, is a very short - check. ... let me do it now, cause you're just going ... Crip, I'm going to go through the C&W operational check for you.
Give me a STOP, COMMAND RESET.
Okay. At 153, ... the TV camera set up for the fish experiment.
Okay.

Yeah. And Y is 170, Z is 60. F, zoom, and focus are - they should be standard: 3.5 – Yeah. When you track, you can tell. Okay? It says here from 606 is where to get that camera. Huh? Yeah. And there there's this TV prep switch list when you get it set up. I'll come on up.

It's DML. Yeah. DML, definitely.

I did. I didn't know. I just ... now for about 40 minutes - about 30 minutes. Yes. Got a little bit of that helium glow, but ...

Yeah. ... nothing to do. ... look forward to something to ...

I don't know ...

Okay; ... Okay; ...

Yeah.

... get your headset off? ... (Laughter) ... exercise ...\n
Just might be ...

...\n
Yeah. ... retrofire. ... in the Flight Plan. ...

No. Go ahead.

... go off ...\n
Right, Tom?\n
No, ...

Vance, you've got to move your ...

...\n
Yeah.
USA ...

ACDR You ought to ... time. Man, this ... You have it on, Duke?

DMP ...

21 46 51 ACDR Okay. ...

ACDR ... down here. ...

CMP ...

ACDR ...

CMP ...

ACDR Yeah.

21 48 15 ACDR ...

CMP Tom.

ACDR Yeah.

CMP ...

21 50 23 ACDR Yeah, I wanted to turn that to zero.

CMP What for?

ACDR ... zero ...

CMP ...

ACDR Yeah, I wanted ... to take a look ...

CMP ...

21 50 42 CC-H Apollo, Houston. Hello at Orroral Valley on VHF. How do you read?

ACDR Roger, Dick. How do you read? Hello, Houston, Apollo.

Okay. Loud and clear. Deke is doing the fish experiment. I'm still working the helium glow scan, rev 92/93.

Okay. Fine.

And Vance is working in between on both things.

Roger.

We're all set to go to that contingency pad for the X-ray. Then we'll start that - in fact, we'll get busy on that starting about 154:00. One thing, we did check the caution and warning. Everything checks okay. The only thing is that the warning tone in our headset - we can barely hear it when it's turned up, but it's real low - it's dropped considerably compared to when we first - first couple days in the spacecraft when that O₂ warning used to keep us wide awake - you know, all the time. As your warning goes on, the red light goes on. But you can barely hear it. That's the only difference. And we haven't had any more funnies where the light would go on with no other warning. Over.

Okay; fine, Tom. Let us talk about that just a minute. We'll be back to you. Thanks for letting us know, though.

Okay.

Apollo, Houston. We're 1 minute from LOS. Hawaii comes up at 153:48.

Roger.

And, Tom, one of the things that we also want to check about the loudness of the tone on the caution and warning is how loud it is with the speaker box turned on, because that's the sleep configuration.

Okay. We can check that. And we'll have an answer for you by the time you get to Hawaii.

Okay. Real fine. Thanks.

Hey, Vance.
Hey, Vance?

I'm watching the ... here on the caution and warning on the squawk box. See how it goes.

Okay.

I think ... we had a hole in it. ... squawk box?

(Loud buzz)

Oh, shit! Yeah.

That's pretty loud.

Yeah. ...

... go over and get me another one.

All right. Give me that. That's okay. Oh, ... anyway.

Yeah. Deke, you put your ... back. ... back.

Yes.

... circuit breaker.

Oh? Well, that solves that.

Do the circuit breakers ... there?

What?
ACDR  Circuit breakers that are in the docking module?

USA  ...

22 07 20  ACDR  Okay; I'll call up Dick. I'm in the docking module. ...

22 14 06  ACDR  And ... Ain't that ... now?

CMP  Yeah.

ACDR  ... starting about now. ...

ACDR  ... over here from ... Thought you had these two ... warnings ... Yeah, right over there.

22 15 07  CC-H  Apollo, Houston. One comment on your jet selects.

ACDR  Go ahead.

CC-H  Well, stand by. Sounds like we may be going in a keyhole. Hang on a second. Okay, you read me loud and clear, Tom?

ACDR  Loud and clear.

CC-H  Okay. You know yesterday we turned off one of the roll jets, Bravo 2, and turned on Delta 2. That balance worked well and the quads are more balanced than they were. The next time you come to a jet select - It's in the Flight Plan about an hour from now, and it's printed there and we want you to go back to the nominal configuration there at 155 plus 07 and then just follow the Flight Plan after that.

ACDR  Roger. Nominal jet select on auto RCS at 155:07.

CC-H  That's right. And then after that just do what the Flight Plan tells you whenever you come up on it.

22 16 02  ACDR  Okay, Dick. From 155 on, we do just exactly the way it's in the Flight Plan.
CC-H That's affirm. And we're about a minute from LOS Hawaii. Newfoundland comes up at 15\frac{1}{4} plus 10. I'll see you then.

22 16 17 ACDR Roger, Dick.

# # #
DAY 203

00 06 51 CMP  Standing by for ENTER ...
ACDR  All right.

00 07 16 ACDR  MARK. ENTER.
CMP  Got it.
ACDR  Next mark 1 minute. ...
CMP  Okay.

00 07 36 ACDR  MARK it. INTERVALOMETER, ON. Okay; that shows 2:30.

TIME SKIP

01 37 26 CMP  Okay; 30 seconds to go.
ACDR  Call them off.
CMP  3, 2, 1 -

01 37 56 CMP  MARK. INTERVALOMETER - INTERVALOMETER, OFF.
CC-H  Okay.
CMP  Steps - step 2 and 3 to get us off.

01 38 02 ACDR  Okay.

TIME SKIP

03 08 43 CMP  Do a count. Do a countdown. Countdown: 5, 4 ...
03 09 25 CMP  No. ... later.

TIME SKIP

03 38 17 ACDR  7:20 in the morning?
CMP  Yeah.
ACDR Yeah. Well—well, I had a huge bowel movement. The first part was just like it was normal. The last part of it was kind of mushy. That's why it took the whole...

DMP You've got that big box of wipes.

ACDR I cleaned up. We'll have water when ... gets picked up. Circuit's turned ... batteries. There's water already. We'll do an SPS burn that ...

ACDR Huh?

CMP ...

ACDR Oh, yeah. ... worried about short-circuiting some wires.

CMP Here's the Experiments Checklist.

ACDR It's not on the checklist.

ACDR You want this damn bag back?

USA ...

ACDR That's close enough for the ...

ACDR ... see if we can get your ... here.

ACDR Got the speaker box set up, Vance?

CMP ...

ACDR That got there.

TIME SKIP

ACDR Where is that headblock[?]?

ACDR Yeah.
ACDR  Huh?
ACDR  Let's get these ... lights out because then - because light from those things is fantastic.
ACDR  You've got a little bit of ...
DMP  ...
04 19 40  ACDR  ...
DMP  ... It's upside down here.
04 21 44  ACDR  Hold it. Hold it. It's got to ...
04 25 08  CMP  ...
ACDR  32.
04 26 57  ACDR  Okay. If that ...
04 30 50  ACDR  30, 32.
CMP  ...
04 33 47  DMP  ...
04 33 53  ACDR  Yep.

TIME SKIP

12 23 42  ACDR  Hey, Vance, for Earth obs, the whole thing is to pitch increase on that NOUN 78, hadn't we? 60600 for the Earth obs? Yeah, we're supposed to go to that. We got 20 minutes to make ... Yeah, the setting's on zero. Pitch, 6060 ... Okay; put in another zero. The ... is 180 ...
ACDR  Got 60604. ... got that.
ACDR  ...
12 27 24  CMP  Do you have the ... set up, Tom? ...
ACDR  Probably.
Okay. If you don't mind, I'd kind of like to change it.

Yeah. Yeah.

You know, it occurs to me we have that press conference in the morning - whatever morning it is - morning whatever.

You going to get up and shave?

We're going to have to be up plenty early.

Yeah. Tomorrow morning.

We'll have to have all the damn cameras set up --

-- the night before.

Yeah. Okay ...

Yeah.

...

...

How about going and getting me the high-gain angles ready?

Yeah.

Minus 4 and 311.

Morning, Deke.

Yeah. (Yawn) Oh, not much. I got an \( O_2 \) fuel cell purge ... Just got through the waste water dump, and it's awful hot. It's hotter than hell in there.

Is it? Pardon? What?

... I'm too tired now. This \( O_2 \) fuel cell purge ...

Vance is down there now. Vance, give me the ... to the urine dump system. Not much to it.
No. Not much. Are there any bags that need dumping?

I don't think — Wait, yes, there's bags from last night.

Okay.

I got an Earth obs at 169:40.

... got a ... You got a bag?

You want to use Myrtle here, Deke?

... He hasn't got everything in there yet. ...
I think all that stuff got put up there; got that out of your way. ...

Put this down on the ... ... the electrophoresis.

Okay.

Huh?

Think in 128. ... You ought to look through that — all that stuff today and see what we got left in here that we can shoot.

Yeah. But —

As far as —

— we ought to be in good shape on that, shouldn't we?

No, I'm talking about as far as the DAC.

Oh, yes. Yeah.

They want to take ... pictures of ... all through that ...

Okay. I think I may have put — He handed me that — We were in a hurry yesterday, when he handed me that stuff up there. That whole thing. I think that had the other one in it.

In your — in your assessment the other day, did you include DAC film, Deke?
DMF Yeah. Let's see - yeah. Okay. What's coming up next? What would you like, grumpy?

12 33 42 ACDR Deke has to get up and do a helium injection. I've got an Earth obs coming up.

CMP Okay.

ACDR Yeah. Get the ... thing over it.

CMP Okay. I'll go down and get some chow.

ACDR Okay.

CMP Put on a headset.

ACDR Yeah. It's hotter than a son of a bitch.

ACDR Hey, Vance, do you think we have a postsleep period of 1 hour ...?

CMP Yeah.

ACDR Hasn't that postsleep period got a TV camera set up for the press conference in the ... TV pictures? Why the hell do you want TV set up? We can do that the night before.

CMP Yeah. ...

ACDR Right. I'm going to put it in here right now, "Set up TV."

CMP ...

ACDR That's right.

12 35 41 ACDR I'm going to have them wake us up a little bit early to ...

ACDR Well, we have ATS.

DMP We have ATS.

ACDR Wakeup at 7:20, retrofire at ..., and splashdown at 4:20 in the afternoon.

DMP That isn't bad.
ACDR  We really - After we get past today, hell, we have ...  
DMP   Okay.

12 36 53 ACDR  Let's see what I've got for Earth obs here. 7A, 7D, 7E.

12 38 37 DMP   Got light again.

DMP   I got a feeling that you ...

12 39 34 ACDR  Yeah, we're not not bad.

TIME SKIP

13 41 06 CMP   Yeah. Ready? Am I in your way?

CMP   Yeah. I am. Did you get ...?

ACDR  Yeah.

CMP   Well, I think we've got a lot of time before we ...  

ACDR  Yeah, we're ...

13 42 12 CMP   Yeah, you know, we've got a couple of days. That's the last big day of the experiment.

ACDR  Yeah, ...

CMP   Got Earth obs? It's daylight outside ...

ACDR  Yeah. I'm trying to find ... Yeah. ... data.

13 43 19 ACDR  How's that battery pack ...?

CMP   I don't know. I haven't really ... But I don't think you'll have a problem.

ACDR  How about getting ...  

DMP   Gee, I'm up in the DM right now.

ACDR  Oh. Oh, I'll just get it then.

13 43 38 ACDR  Is that right? Well, I wouldn't - I wouldn't dare ...
Okay.

I'll tell you what. ... supposed to do ...

Earth obs pass - revs 103-104; sites 7A, D, and F[sic].

Apollo, Houston. We are about 45 seconds from LOS. Our next station contact will be Quito in about 28 minutes, 169:55. See you there.

Okay, Crip.

If you guys get a chance, we'd also like you to CLOSE the POTABLE TANK INLET valve, save a little water for us.

Can do.

Thank you.

You ... about the tank. Okay, Deke?

Yeah; okay.

As you look at that ...

Yeah. Yeah. ... ... Earth obs?

I don't know. Yeah, if I can.

Okay. It'll be on the left side. ... left side. ...

Okay; I'll give it to you later ... Got ATS, I think, coming up a little later. It'll be minus 4 and 311.

Minus 4 and 311.

I made a fairly close ...
Okay.

If ... can help.

Is ... power on?

Power to ...

... on.

We have a mixture of ...

I'm going put this high capacity urine filter in the loop. We sure don't want that urine vent to plug up.

... 

Huh? Yeah. Yeah, I think I'll just plug it in now.

I don't think that that would give me a vacuum. ...

... 

That's true. But we never think to put it on when we do the special dump, you know? I think I'll just stick it on on this next one.

I sure wish we would have Earth observations stuff back n ... ...

Huh?

Yeah, but - well, yeah, but I mean that - that right now. We have ...

... 

Yeah.

From the beginning, ... take some very unique pictures of everything. Currently, ... be kind of a likely target for then, I would think. Don't you?

Yeah.

Well, hell! I just found out you can't plug Myrtle and that high capacity filter in at the same time.
Really? ...

... high capacity filter ...

Oh, yeah. ... has to be ...

Okay. Now. I seem to remember, you said something about battery pack. Get those?

No.

Okay.

What locker are those in?


Yeah.

Well, we got the battery ...

We've got to get ...

Yeah.

...

Yeah. Well, not - not a problem. ...

...

... plate.

...

Pardon me?

Mix with ... and water.

Oh, one thing while you got ... help you ...

True. We're ...
ACDR  We're ...
ACDR  ...
DMP  ...

14 09 09 CMP  Pardon? Okay. How you doing?
CMP  ... kind of worried for a little bit.
ACDR  Why, because ...?
CMP  I never heard that ... any more. Huh?
ACDR  ... need it ...

14 09 41 CMP  Yeah. Well, it works okay ...
ACDR  Yeah, ...
CMP  I think you've got to be real careful when you've got the high capacity filter. Seems like they ...
ACDR  Yeah. ...
CMP  ...
ACDR  ...
ACDR  ...
DMP  Okay. ...

14 11 42 ACDR  To the left.
CMP  To the left of 1, right?
ACDR  Yeah. To the left of the valve. Just like that.
CMP  You're right; left of the valve. ...
ACDR  No, it didn't. Didn't have a ... ...

14 12 35 ACDR  If you hadn't ...
CMP  Yeah. You passed it. ...
ACDR ... just because ...
CMP I would put - Yeah, you're ...
ACDR ... filter ...

14 14 16 ACDR ... we're going to get ...
CMP ... 
DMP ...
CMP What are you ...

14 15 04 CMP I see land up there, but it's ...

14 16 52 ACDR ... back to the ... right through ...

TIME SKIP

14 57 05 ACDR ... there, Vance.
14 57 09 CMP Okay.
14 58 07 ACDR POWER, ON; POWER, OFF.
CMP Yeah. ... Got the ...?
ACDR Yeah.
CMP All right. ... 

14 59 33 CMP Okay. We're coming up on X-ray obs, check ... seconds. ...
ACDR Is there any modification to the procedures?
CMP No. All you have to do is turn the - turn it on, and it's standard X-ray obs. Get it right now.

14 59 57 ACDR All right. ... the checklist. X-RAY COVER, OPEN, barberpole. You want HIGH VOLTAGE POWER 2, right?
CMP Yeah. That's standard.

15 00 15 ACDR All right; it's ON. Mark the time?
Okay. ...

... Where do we have to go to ...?

What all did you have to do?

Shoot!

We're supposed to be at this attitude. We got a slow maneuver rate.

Maneuver's too slow.

What?

Maneuver's too slow.

Yeah. We never got there by 3:19. We should have had a faster maneuver rate.

... faster.

... faster ... our rate. ...

You want it now? Stars ... Be sure and make ...

... faster.

Yeah.

...

334 ...

...

... Oh, shoot!

...

Okay. We're ready now. 3 --

POWER, OFF?
Well, I guess we can get that when we get to the last one. Oh, shoot!

HIGH VOLTAGE POWER is ON, right? Oh, hell ...

You want us to turn it off – off for 5 minutes?

Yeah. But we're supposed to be in an attitude. We're not going to have ... You migh as well turn it off, I guess.

Well, I got to purge this.

Yeah. Okay.

Okay; let's see. The next point we can pick up at – is 8:47.

Do you want the covers closed or just the doors closed?

Oh, no. Just POWER, OFF. Oh, hey, turn – close the –

All of them?

-- doors. Yeah.

Turn the whole thing off.

I'll leave the LOW VOLTAGE POWER, ON.

Okay. ... going down now ...

Okay. That's the first attitude. ...

Got the ...

... coming up that way.

They want the doors left open for this.

Hey, what we do is ...

...

Well, that's right. Okay.
ACDR  I'll turn it back on as you - Tell me when you're there?

CMP  Okay. You can turn it back on. ... for 14 minutes.

15 06 53  ACDR  Power's coming back on.

15 07 37  CMP  Okay. I'm sure hoping we can make that. Why don't you make it HIGH VOLTAGE POWER 2.

ACDR  2?

CMP  Yeah.

15 08 11  CMP  Okay. We've got her up and ...

ACDR  Okay. Did you get the ... on the tape ...? Have you got that done?

CMP  Yeah. I got that done. I'm just trying ...

ACDR  I think something popped out of here. Okay. Your new film ... just popped out. Just popped out.

15 10 10  CMP  Turn HIGH VOLTAGE POWER, OFF. ...

CMP  6 seconds.

15 11 13  CMP  Off?

CMP  Yeah.

15 11 15  ACDR  It's OFF.

DMP  How long does it take to punch this?

ACDR  Punch, you fucking thing! We got such a God damn screwup!

ACDR  It's powerdown, and just off and on. Turn it on again?

CMP  Well, you know, you have the - What you did was you powered down, ... and then you powered up again.

ACDR  Yep. It says power ... for X-ray obs ... You want the HIGH VOLTAGE POWER, OFF?

CMP  Yeah.
ACDR  But that's not - but I powered down.

CMP   And then you powered up again.

ACDR  Yeah, I know.

15 12 05 CMP  Okay. ... HIGH POWER - HIGH VOLTAGE POWER to 2, just
           now ON. But to do the powerdown, the purge ...

CMP   ... 20:03.

15 14 12 CMP  Do that next. The purge ...

CMP   Okay.

15 15 42 ACDR  ...

15 17 15 CMP  ... VERB 49 ENTER. Okay; plus ...

ACDR  ... huh?

15 18 05 CMP  Yes.

CMP   I crossed it out surer than heck.

15 18 56 CC-H Apollo, Houston. We're AGS VHF only through Orroral,
           currently. I got you for a couple of minutes.

CMP   Okay.

ACDR  Crip, we can barely read you.

15 19 54 ACDR  We were holding when he started ... I had that
           attitude ...

CMP   ... Give it to them ...

ACDR  Do you want to take the ...?

CMP   Okay.

ACDR  Huh? Let me know when.

CMP   Okay.

ACDR  Ready?

CMP   Ready -
15 20 35  
CMP  MARK it.

ACDR  ... I'm watching it.

15 20 52  

CMP  Okay, Crip.

CC-H  That's about 30 minutes from now.

CMP  Okay. Just for your info, we had maneuvering problem and lost the data from after 2 minutes up to 8:47 on. How do you read, Crip?

ACDR  ...

15 21 51  
CMP  Got it.

ACDR  So if I can't drive this, I'm going ...

CMP  Yeah. The question is, should we go the full 5 minutes or should we cut it off at 26:20?

ACDR  It's still maintained.

CMP  Yeah, I know, but the question is ... drifted out of attitude.

ACDR  I know it. Well, we don't have this ...

CMP  I guess if you've got to stop someplace ...

ACDR  Right.

CMP  Someplace that ... tape recorders, a lot of ... Get an off nominal ... do a data take later downstream.

ACDR  Yeah. ...

CMP  Okay. Which - Have we started --

15 23 02  
ACDR  Okay. You've got 2 minutes to go again. 26 to 28; assuming right after 28, it's right about 29. So, we've got 2-1/2 minutes to get to the attitude. We'll get that real fast and ...
15 24 30  ACDR  Go.
CMP  Okay.
ACDR  Then, we've got --
CMP  Okay.
ACDR  -- 4 minutes to get things started.
CMP  ...?
ACDR  Yeah. Next start at 24 --
CMP  ...
ACDR  -- 24:29 - I mean, 24:25. ... Power down.

15 25 17  CMP  That's right. You should power down. The first thing is at 29. Then we want to STOP,REWIND, and COMMAND RESET.
ACDR  STOP,REWIND --
CMP  Yeah. At ... STOP,REWIND, and COMMAND RESET.
ACDR  Go.

15 25 38  CMP  MARK it.

**TIME SKIP**

18 01 48  ACDR  All right. Change the ... temperature.
ACDR  Oh, it's minus. ...
CMP  Hey, Tom.
ACDR  Yeah.
Would you turn the HIGH VOLTAGE POWER, OFF, for a second? Oh, I'll get it.

HIGH VOLTAGE POWER, OFF.

Good. And we'll turn it back on now in about 2-1/2 minutes.

Check.

Okay.

Huh? ... What? That looks like a ...

Yeah.

... it's 44.

Yeah.

30. ... on. 30 degrees. ...

I don't know.

... 

Yeah.

Okay.

...

Yeah.

... flash attachment?

No.

Where's mine?

Where's your flash attachment?

Going to have to ask him, I guess.

Deke.

What?
Where did you put the flash attachment for the Hasselblad? Yeah. Which one? By your seat?

Okay; I got HIGH VOLTAGE POWER, and ... starting to go down straight.

That's automatic then?

Yeah. ...

...

...

Okay. There's a super big raster. Yeah. ... Okay. ...

for you too, okay?

Okay.

... Good. Okay; which way should I get? This way? Okay; brighten it.

That thing's ...

Except one of ... Yeah. ... Hasselblad.

I've got HIGH VOLTAGE POWER 2 to OFF now.

All right.

...

OFF, barberpole.

Okay.

You got that picture? You mustn't miss it.

Okay. I just ...

Let me know if you need anything, Vance.

Okay, Tom. Not just now. I think it's working pretty good.

Good. She checks out well. Huh?

Got a Flight Plan down there?
Yeah.
Okay.

... Right here, Deke. MA044. Yeah. Got the furnace shutdown, the furnace prep. Furnace prep. MA044.

Need the HIGH VOLTAGE POWER 2, OFF, down there.

It's OFF.
Okay.

You counting those ...

Yeah. Real weird. Could've done a raster - or rather, fast raster going along ...

*** on the ETE?

Yeah; okay. We went back, and we're checking --

Okay. Going over the hill. See you at Goldstone in 16 minutes.

Okay. ...

Okay. INTERVALOMETER, ON. ETE MODE SELECT, see table 1. Electro.

...

...

... the Earth Obs Book ...

I'll tell you what, I'll try to ...

...

...

Okay. I'll ...

Say, we can call down and ask about the DAC ... be on that ... I think it's in the Photo Ops ... All right. ...
ACDR  That's what I thought. ...
CMP    I'll be ... I won't be in the window when you ...
ACDR  Yeah, ...
18 43 55 ACDR  You going over ... take that DAC ...
18 46 15 ACDR  Okay; I'm going to ... put the DAC on.
   DMP  ...
   ACDR  ...
18 48 39 ACDR  Okay. It's 174:26. ...
   ACDR  ... right before the ...
18 50 35 ACDR  I'll take that tape ... Hell, they ...
   CMP  Yeah.
   ACDR  ...
   CMP  Right.
   ACDR  ...?
   CMP  Yeah. I just saw a ...
18 52 04 ACDR  Well, hell, if they were any ... nobody ...
   CMP  Well, ...
   ACDR  Let's see ...
   CMP  ... I'm not sure ...
   ACDR  ...
   CMP  ... Okay. Let's get ... Got a ...
   ACDR  That's about right, I guess.
18 55 43 CMP    Yeah. ... I don't know.
18 56 06 CC-H Apollo, Houston. We're AOS through Goldstone. We
              have you for about 3 minutes.
ACDR  Roger. And we're right over the Rio Grande River now. Yeah, I wish the girls could see this site up here that we're seeing, Crip.

18 58 15  CC-H  Yeah. Right now we got the TV playing for them of Vance doing those science demo things over in Soyuz.

ACDR  We're right over El Paso. You can look down and see Dick's Air Force Base and the International Airport.

CC-H  Roger.

ACDR  ...

CMP  Guadalajara ...

ACDR  ...

19 00 00  ACDR  Okay, Crip. We're - looks like we're ...

19 01 31  CMP  We're ... Earth attitude ... attitude ...

ACDR  ...

CMP  ...

19 06 13  CC-H  Apollo, Houston. We are AOS through Newfoundland. And with the ATS, we should have you about 50 minutes.

ACDR  Roger.

CC-H  Okay. And we got it rigged up where the girls are listening to you again. Incidentally, if - to help this problem we've been having with some of our interference, one of the things that - about the only thing we can come up with doing on VHF is to go ahead and select SIMPLEX Alfa now, instead of staying in Bravo, and that'll change the freq and might - might get rid of some of it.

CC-H  That's affirm, Deke, if you would, please. You can go ahead and go Alfa, and Bravo off.

19 07 08  CC-H  Rog. Was it pretty clear?

CMP  Unfortunately, it was covered with clouds over Sudbury nickel and certain sights that I was to get. But it is very impressive. No doubt about that.
Incidentally, Vance, while I've got you there, that last pass we had you guys run — end — ended up leaving you in 1/2 degree for your rate on your DAP. And you can go back and change that to 0.2 whenever you'd like.

Incidentally, we did get to see the Adriatic. Got quite a few pictures of the lower half of Italy, from the boot up to — oh, I think it's — oh, I'd say about halfway up. But it — it was a cloud cover over Venice.

Copy that. Thank you very much.

Hey, Crip, tell the girls I wish they could ...

... See there, right there?

That looks like it came from a ...

Oh, that little spot?

Yeah. That white thing.

It looks sort of like ...

Yeah. Look at the — look at the trailing wake behind it.

Hey, Crip, we just had a big iceberg out here in the North Atlantic, and it had a trailing wake behind it.

Copied. A large iceberg with a — a trailing wake, is that correct?

You see, it's like a, you know, like a — a bow wave on it.

Rog. Tom, we ended up dropping out there on VHF when we were trying to switch over and get ATS. And I'm back with you now on VHF. Don't think we got ATS voice locked up good yet. But I think you were just about to make a comment to the girls, and I don't believe they heard it.
I said I wish they could enjoy this view we're having up here today, looking down at the Earth.

Rog. I imagine that's quite a sight.

... Chicago a couple times ...

Very good. Bring them back, and we'll all be able to have a chance to take a - take a look at that beautiful view you guys got.

... 

... 

Yeah. ... bow wave ...

...

Incidentally, the Flight Plan calls for me to give you an update to the mapping pass you got on mapping pass number 10 - you've got on the next - next rev. And that time is nominal. We do not need to change that. Any time that it might be convenient for you guys, I have a rev 138 block data pad that we can go ahead and update to you.

Rev 138 block data pad.

... need to - need the Updates Book. But need to make sure I'm locked up good on the ATS before I give that to you. And apparently we're not yet.

Okay. Before we go into that, Crip, we haven't seen ... been very hard to see the Antarctic area due to cloud cover. ... stray icebergs down there. ... first iceberg we've seen. Might just mention that, up here in the north, it was traveling through a - looked like a fog layer - and leaving a wake. ... stationary, ... No evidence of rotation, which is one of the questions they've asked about icebergs in general.

Okay. Sure that Farouk will be happy to get that data.
ACDR  Okay. I got the echo again.

19 13 12  ACDR  Updates Book.

TIME SKIP

20 27 39  CMP  There yet?
ACDR  Yeah. Here's the California coast. There's San Francisco, the Golden Gate, ...

CMP  Very good.
ACDR  Yep. ... Nice ...

20 28 19  CMP  And the color I can get from the Pacific Ocean is 47-B just offshore from San Francisco. No evidence of current boundaries yet. Little bit of cloud cover up to 2 miles offshore.

CMP  Okay. Yeah - I'm tracking it.
CC-H  *** after you finish your mapping pass. Also, if Deke can, I'd like to get an estimate as to whether he wants to try to go ahead and get that OBS exercise in early, or is he going to go ahead as called out in the Flight Plan?

CMP  Oh, well, we got the photos. He'll get the end of it anyway.

20 30 34  CMP  Okay; the Bingham copper mine - looks to me like there's definitely an area of gray over there, or has a grayish cast. Now it could have been a false fault. Now that - Part of the - All I can say is the area around the Bingham copper mine was once quite pronounced and very gray.

ACDR  ...

CMP  Okay.

20 31 10  CMP  Well, --

TIME SKIP
You heard Crip say that ...

Yeah. I wonder ...

Been 5 minutes since they've gone over the hill. Let's see, next pass is at ...

... vis obs ...

Have you got the Earth Obs Book?

Yeah.

Apollo, Houston. We're AOS through Orroral for 3-1/2 minutes.

Okay.

Hey, Deke, all the — our medic folks would — really appreciated that — all the efforts you went through to get that data. It all came out nice and clean here. It looked real good.

Yes, sir. Everything was super.

Okay; fine.

*** line entries but not nearly as long as some of the ones we've already made. If somebody is available at Hawaii, which comes up in about 15 minutes, I would certainly appreciate being able to read the modifications to you there. Incidentally, your recovery ship is also going to be active on — on your — VHF, and you might be hearing them when you come across there this time.

Okay; real good. ... And we'll go ahead and maneuver, okay?

Okay; fine. Press on. And the PI'd really appreciate it. He's pretty excited about this new target.

Okay. ... 

... huh?

Yeah. Power's off. I powered down. ...?
ACDR  Yeah. ... yet.
CMP  ...
ACDR  Oh. ...
DMP  ...?

21 41 11 CMP  Yeah. Yeah, you drew in. ...  
ACDR  ...
CMP  Yeah.
CMP  ... I've never noticed ...
ACDR  ... 30 minutes?

21 43 30 ACDR  35 minutes.
DMP  Well, let's see here. Got the DAC.

21 43 50 ACDR  ... We have the - the light flash setup after this  
... The light flash is stowed up there with the ...

21 55 27 CC-H  Okay. We're about 1 minute from LOS Hawaii. That  
was kind of a busy first pass. We'll be seeing you  
coming up here at Bermuda in about another 15 minutes,  
and I'll call you there.
ACDR  All right. And real good. Are the ATS angles the  
same, ... to lock on, the book was wrong. Over.

21 55 53 CC-H  Stand by just a second. Tom, these ATS angles are  
correct.
ACDR  Real good. Thank you.
CC-H  Okay. See you later.

21 56 07 ACDR  Say. One thing. Is the nominal time counting up  
at 177:58:36? Over.
CC-H  That's affirmative. It was less than 1 second off,  
Tom, and we've decided not to change it.
ACDR  Real good. Thank you.
See you later.

TIME SKIP

And this was the - the last of the - complicated experiment pads, and I don't see how it could have gone more perfectly. Looks like a real good show.

Ah, thank you very much. We'll also thank you guys on the ground, because you really helped to pull us through here on an occasional mistake on a DSKY punch or something else. It was all very efficient. Thank you.

Well, I was looking hard to catch a mistake that time, but I sure didn't see one. Also like to pass --

*** that last maneuver, Tom, I'd like to talk to you a bit about the ... on the secondary evaporator.

Go ahead, Dick.

Okay. It turns out that we've got a choice, Tom, and we've done a ... in the last 10 minutes. If you activate the secondary evaporator, which is in the Flight Plan coming up here right after this pass at 178 plus 50, and can leave it on just about all the way to bedtime and then --

Apollo, Houston. We're coming up on 2 minutes to ATS LOS. Bermuda comes up at 179:21.

Roger, Dick. Glad it went real good for them.

Boy, that was super, Tom. I assume Vance and Deke didn't go EVA or something. I haven't talked to anybody but you since I got here. They didn't abandon ship, did they?

No. What we're doing is trying to get ahead of it, and we're already setting up the light flash experiment. Those two been working on it full time.

Roger. Sounds good.
It's Tom's day to talk.

Okay.

Well, we'll see you at Bermuda.

Okay.

Okay. In about 40 seconds, I've got a couple of switches over there.

All right.

I'll call them out to you.

Okay. I want - DSE, LOW BIT RATE, COMMAND RESET.

DSE, LOW BIT RATE, COMMAND RESET.

EUV on the helium glow powerdown.

Where's ...?

It's on the ... here, Deke.

Okay.

# # #
Okay. Tell me when you ... program ... ...

Okay, Deke. And we're about 30 seconds to LOS. Guam comes up about 40 minutes from now, at 181 - 180 plus 21, in case we don't get these readups in.

Okay. We're standing by - 183.

Okay. Down in the DP column at 183 plus 20, I want you to delete "X-ray" from that ops there. And down below that, also delete - "Remove the cabin vent QD and stow it." We're going to need it tomorrow. We are going to do another purge, and we'll be seeing you on the ATS.

Okay. You say you will not do a purge tomorrow? Purging today, right?

We - we are going to do it tonight, but we do not want you to remove that vent QD and stow it. We want you to keep it out because we're going to use it tomorrow.

Okay. Understand.

And, also, delete the X-ray $\omega_{PC}$.

Got it.

And, we'll see you when we get locked up on the ATS.

Okay.

I got ZFF photos, Tom.

Say, I got the bag ... delete ... the purge tank set.

You got some place you're putting partial bags and ...?

Not me. Vance ...

Okay.

...
Okay. Well, here's one that's got about 3 degrees ... management ... what we had. But by the time we do that we've already done it anyway.

Hey, where are you headed, Deke? Right - right there?

... down there.

You about ready to pitch 2?

Okay.

38 minutes.

... The Flight Plan ...

Vance was fooling around ...

I thought we were ... bag ...

... whole bag is gone for ...

I think it's this one.

I don't know.

... after ...

So, ...

Well, I don't know, think ...

I guess we're going to have to fake it. I know what happen, I bet you. ...

... try another bag if it's ...
Yeah. ... Okay; CMC, FREE.

Yeah. I've been going to ... those batteries.

Yeah. We better watch that too. ...

...

Okay. ...

Well, let's see ...

What happen, Tom? ...

...

Yeah, I'll be ... You already ... Well, the ...

Now, probably ... through. It's all right. ... we're already there. ... POWER, ON; POWER, ...

running ...

Yeah.

... Yeah. ...

TIME SKIP

How about that?

Okay. I saw long streaks over in the right corner.

...

Not very exciting for you, I don't think ... not very exciting for you right now.

No. ...

...

...

...

Yeah. That's why I stay ...
... my eyes are watering.

How long before we ...?

I've got a long streak ...

Okay.

... saw a star in the ...

Very right ... upper right ...

Okay; I got a star, ... Star ...

I see a long streak, upper right ...

... There's a star ...

Star, left side. ...

Star ... left side, ... I don't know, it's probably ...

Star, I'm sure ...

Star. Well, that's to the left.

... right side to left side, I'm sure ...

Star ...

3, 2 ...

I'm going to follow the ... here ...

... That's enough.
Okay. Streak, right side to left side.

I saw a star ...

... right side to left side.

... right ... right ... It's real strange.

Okay. Streak, upper right ... Saw a bright star, upper left ...

... I saw a real strange thing. ... 

... star ... left ... Short streak ...

... star ... lower left ...

... right.

Right ...

... right of the right eye. ...

Okay. On the very ...

Saw a star ...

... star ... right eye.

...

Yeah. Yeah.

Yeah.

... Deke. Yeah, ...

That's a ...

Okay. I got a long streak.

In this kind of thing, you know, when the lights are bad, the short streaks - the short streaks ...

My angle is right eyeball.

Okay. Got a star, right eye, center.
Okay; a long streak ... of my right eye, and it was vertically orientated.

Seem to be having flurries quite often.

Yeah, ...

Okay. Got a very bright star in the lower right quadrant of the left eye.

Okay. Got a diagonal long streak. I think it was a - either a long streak or ... streaks in the left eye, center.

Okay. I've got ...

...  

Do it now.

Okay; now. The pitch ... centered.

TIME SKIP

Okay. ... - everybody make a ... Who's got the ...?

DM Checklist, helium injection, page ...5. Yeah. MA044[?] ... ... verify. ... light on.

Okay. Right.

Wonder if that's verified?

Yeah. Verified on ... I'll get the ... All you got to do is ... I'll - I'll get the ...

Yeah. Where did the fucking procedure go?

You say it's different?
... get the procedure out, take the apron off, and open the doors, and get the canister out ...

Huh?

Yeah. ...

Huh?

..., please. I'll get rid of the other stuff.

I'll - I'll still give that a hack down here. I'll still give that a hack, I guess. Oh, okay.

Thank you.

Deke, would you hold that thing? Oh. Damned thing disappeared. Well, fine. (Laughter)

Yeah.

Well, ... on the - on the screen ... I don't know. Oh, yeah. ... interior.

... ... we haven't got.

I said ... the valve. Guess that's about it. The water's good.

May be cool enough to ... with the fan on tonight.

There you go.

Say again, Tom.

Go ahead. I'm going to go with you.

I'm going to turn on the speaker box here while we're working. Then if anybody calls, get it that way.

— — morning. We'll wake you up early, and we do not see that the SIM bays are activated yet. Just be sure and don't forget to activate them and use detector 1 on the EUV.

Okay. Understand. We're still venting.
Okay. Understand. So we'll see y'all in the morning.

Good night.

TIME SKIP

Good morning, Bo. How are you?

All right. Real good. Thank you, Bo.

Houston, Apollo. Houston, Apollo.

Apollo, Houston through Ascension for about a minute and a half.

TIME SKIP

Yeah, that ...

Okay; let's go ...

(Music)

That's my favorite music. ... What?

Granolies.

Granolies! Very good. We're about a minute from LOS, and next station contact will be through Quito in 28 minutes. See you there.

Okay.

Have a long rest period for both of us to get some breakfast.

I never got up early except ... during Apollo 6. ...

I could probably ... this way.

Yeah.
CMP  ... get us busy on those ...
USA  (Music)

13 32 29 ACDR  Yeah.
DMP  Oh, shit!
ACDR  What happened?
DMP  I spilled some ...
DMP  Yeah, ...

13 33 05 ACDR  Yeah. Yeah. ...
CMP  I got a ...
DMP  Well, maybe ... out of there.
ACDR  Right up here, Deke.

13 36 04 ACDR  You better go for ... that's all there is to it.
CMP  I don't know, I think we can leave it up there. ...
DMP  ..., Tom.
ACDR  You got ... garbage bags over here?
DMP  No. Throw away ... I'm going to have to ...

13 36 37 ACDR  ... throw that towel back there, right? ... throw that towel away.
DMP  All right, here it is here. ... we have two or three other - well we have to have ...
ACDR  Okay.
USA  (Music)
DMP  Tom, I think there's a ...
ACDR  What?
DMP  Where's that place that says ... Where's my ...

ACDR  Okay.

DMP  You got it ...? It's a little high.

CMP  Hey, Deke.

13 41 47  DMP  Yeah.

CMP  I think I can ... this one. That's to your right, I think, Tom.

ACDR  No. ...

13 42 53  CMP  I don't know. Let's --

ACDR  ...

CMP  Yeah, I don't know why.

CMP  Oh. No, ... don't worry about ... I can ...

ACDR  Yeah, go ahead.

CMP  ... we get the ...

13 44 04  CMP  Hey, Tom, when do they want that ...?

ACDR  Want to do it now?

CMP  Might as well wait, I guess. I was going to do it but ... I can do that now.

ACDR  ... Yeah.

CMP  Yeah. Urine's dumped, and we've already done all that ...

ACDR  What about ...

13 44 49  CMP  Oh, there it is. That's - I'll start the water dump ...

(CLaughter)  ... It's only been on a short time.

CMP  (Laughter)  ... right here, Tom. You got ATS set up?

CMP  Hey, Tom?
Yeah.

I'll show you where I want to - to get those canisters changed.

I've got a ...

Yeah.


Okay.

Funny thing. The very last canister I picked up there was the right one. ...

You know, I have to ... this thing. Never ... the LiOH canister ...

Okay. The canister's changed, Tom. Here's your tool E back.

Waste water dump in progress?

No. I was wondering if it's been 20 minutes yet on the heater?

Yeah.

Yeah? We did 20 minutes on the purge heater?

Well, the waste water dump ...

Yeah. That's all ... been cleaned out before we start that. Oh, yeah. Oh, yeah, you're right.

...

The ... Okay. You ready to go?

... We've got - we're down to 6 ... Wait till we talk to the ground.

All right. ... water's ... on time anyway. When you check it off, ... they'll bring it up ...
ACDR  Okay.
CMP  Okay. What else we got?
ACDR  Yeah.
CMP  Yeah. Okay. ...
CMP  ... I think we have one more.

13 51 05  ACDR  Do you have it straight on the pitch?
DMP  Yeah.
CMP  ... up here.
ACDR  Deke, ...
DMP  Yeah.
CMP  ...
ACDR  Better wait for the ATS. We got the uplinking set up ...?
CMP  Oh, ...

13 51 44  ACDR  What - Deke, what camera ... the pictures? Is it still up there?
DMP  ... number 20.
ACDR  20.
DMP  Yeah.
ACDR  Okay; ...
DMP  ...
ACDR  Yeah.
CMP  Oh, Tom.
ACDR  Yeah.
CMP  ... it said right here to ...
ACDR  ...  

13 52 44 CMP  Say again?  
ACDR  What's the ...?  
CMP  22.  
ACDR  You got that ...?  
CMP  ... 58, 59.  
CMP  Okay. ...  

13 53 44 ACDR  Take the portable light and ... off.  
CMP  Oh, yeah.  
ACDR  *** Did you hear what Crip said, ... the light ... follow the light. Well, maybe we better wait until we get station contact. I tell you what you can do, Vance - or I'll start doing it. Are all those - that dim light - are all those ... up here. ...  
CMP  Yeah. Yeah. ... get height measurements - get that real fast.  
ACDR  The height measurements, somebody stay on the ... You do ... height measurements there.  
CMP  Okay. ... I was wondering if you could ... a count.  
CMP  Yeah. I got it.  
DMP  ...  
ACDR  ...  

13 55 00 DMP  Yeah. ...  
ACDR  ... Oh, Vance let go of his ...  
CMP  Yeah.  
ACDR  We got a ... that we like better.  
CMP  Yeah.
ACDR ...  
DMP All right.  
CMP Okay.  

13 55 39 DMP Okay; set clocks. Get ready to ... when clock is set.  
ACDR No, we don't need them.  
CMP Oh, yeah. That's right.  

14 56 06 CMP Well, we can stash it in here but ...  
ACDR Let's try this one.  
CMP ... on there.  
ACDR All we need is one.  
CMP Yeah. Let me have the ...  
DMP ...  
ACDR It's got about ... left on it.  

14 56 22 CMP Star is Atria, 34, Tom.  
ACDR Which one?  
CMP 34.  
ACDR Okay.  

14 56 35 CMP All balls; plus 112, minus 104, minus 32.  
ACDR All right.  
CMP 3 ...  
ACDR Okay. Got it ...  
CMP ... Except for...
ACDR  Is it back to AUTO?

CMP   I'll see. ... 

ACDR  Yeah. Get that squared away. You have your option ... 

CMP   Okay. ... 

ACDR  Squared away on it, Vance? 

CMP   Yeah. 

ACDR  You don't have any ... do you? 

CMP   Not to my knowledge. 

ACDR  I'll get down here ... 

CMP   There's that ... 

CMP   You got it? 

DMP   Okay. Just a second. 

CMP   Okay. ... 

DMP   Okay. Take it. 

13 57 29 CMP   Okay. ... get that last - that last - Well, it was pretty questionable. 

CMP   Okay, Crip. Got you loud and clear. 

13 57 46 ACDR   ... camera 

TIME SKIP
ACDR ... Yeah.

CMP ...

ACDR All right.

14 58 01 CC-H Apollo, Houston. We're with you on VHF for about 5 minutes here.

ACDR ... inside that ... control?

DMF Oh, I don't know.

CMP Okay, Crip.

CMP I've got a fine ... pen.

ACDR Still don't know.

CC-H And, Vance, you know - no need to acknowledge if you're working on 52 there. We did not see detector 2 selected on that EUV when we went over the hill. Just a reminder, Vance.

CMP All right. I couldn't hear you, Crip. You're too weak. Please repeat***

CC-H Roger. We're saying, did not see detector 2 on the EUV. If you get a chance, you might reselect that for us.

ACDR Okay.

14 58 49 CMP Okay. Now we're reselecting detector 2.

CC-H Thank you.

CMP Okay. Did you see her?

CC-H We're VHF and don't have data right now.

CMP Okay. Well, we can try it again.

DMF Hey, Tom, did ...? Do you know?

ACDR Yeah.

DMF ... five.
ACDR  Well, we ... 5 or 10 ...
DMP  You're going to end up with a whole cockpit full of -
ACDR  Yeah. That's what it is.
DMP  ...
CMP  Yeah. Okay. I think ... you got the checklist?
DMP  Yeah, I do, but I ... down here is the problem. ...

14 59 38  CMP  All right.
DMP  ...
CMP  Okay.
DMP  Yeah. Tom?
ACDR  ...

14 59 53  CC-H  Apollo, Houston. We're 1 minute from LOS; going to see you in about 30 minutes at Quito.
CMP  See you at Quito.
ACDR  ... another five ...
DMP  Okay. Now ...
CMP  Okay. I'll be down here in this cockpit ...

15 00 19  DMP  Okay.

TIME SKIP

15 33 05  CMP  Okay.
15 33 09  ACDR  Okay, Crip. I got the DOPPLER RECEIVER OPERATE on, exactly on time, at 195:03:00.
15 33 17  CC-H  We're going to go over the hill here shortly. Pick you up again at MILA in about ...
ACDR  I've got to check the bags.
Let's see, I wonder if somebody could hand me some Velcro straps ... or tape. I got to --

Which would you prefer?

Well, may need more than one ... the straps ...

Okay.

I got the coiled up hose ... stash it here. ...

Okay. I'll help you.

... disconnect it here. ... separately.

Yeah.

... all together. All together ... You still got the wrong one.

Okay. This one here ... separate bag ... Okay. You got one of those rascals there.

Yeah. Got one right here. They're holding much better.

Okay. And we're going to do - just a ...

That's almost right ... That ...

Okay. Unless you want another one there.

No. That's ... one ... Stuff her in a bag here. That one. In fact, we ought to ...

Right.

Down here ... There's another one. Bag ...

Right. ... in here.

You must have - got you one above your head.
Uh! Let's see what's next on the list over here. Okay; 61. I was under the impression ... camera cable.

Yeah. We got that out this morning, and I'll toss it up to you. Okay? Where's that Russian [?] cable there, Tom?

Up behind me.

Okay.

... somewhere else.

Apollo, Houston.

TIME SKIP

Okay; it's done.

Check it in 15 minutes. Roger.

Yeah, we're still working.

That - that ... going to come up, Vance? That ...

Yeah. Finally. It's up to 4.7 - 4.6.

Okay; that's --

Is that ...

Okay.

... it's going nowhere.
... Let's see; it's not there.

... There. Now we got it.

In just a little more.

The ... thing is ... going back - oh, a little more.

... be climbing around.

Yeah. ... get it into the bag. ...

That Doppler thing working yet?

Yeah.

Yeah. I just ...

Okay. ...

... this jettison bag.

Where do you tie it up at?

Against the furnace valve box and tie it down with the rope ... rings ... wall.

Furnace box.

... let's see. ... ...

Where is it down here? Oh, I - I've got it. There you go.

Okay. ...

... up here ...

Yeah.

... rings is what I'm looking for. ... there.

Tom, what do you want me to do with those ...

... yeah, ...
... for this bag ... here.

... hold this one for you? I've got ahold — Yeah, ...

Okay. ...

That'll hold.

... tie it up in here.

... D-rings?

Yeah.

Vance?

Yeah.

...

Not yet. We have to wait —

... attitude.

Okay. There we go.

Okay. There. ... down ... I think we're better off to keep ... like this. That way we avoid ... We want it ... right attitude.

... over here. That's right.

Yeah.

There. I've got it.

Oh yeah? ...

... think they're blocked ...
... your head ... here's one more ...

... I got ...

Now they're ... coming around ...

Yeah. Okay.

... stow it ... put it ... back up in ...

No, no. Now they're ... again.

They are?

Yeah. Get me another rope.

What? More rope?

Yeah.

Tie it back ... Let's go ahead and ... those ...

Okay, let's tie that one off. ... We're better off tying that from over there ...

How's that ...

... another one over here ...

... tight. There. That ...

Now there, ...

... don't get it, ...

Yeah. Try and get her up and move her back ... back in the ... bag. ... cable's down in here ...
There's the cable you sent back; another extension cable, right?

Oh --

I just found a ... cable ...

Yeah, okay. I got ... here.

Okay.

... Can I help you pull on that?

Yeah. In a minute. ... I have to go ...

There. ... That ... not going anywhere ...

... Where's your checklist?

Right here. ...

...

Okay. We're right at the time when we're supposed to be.

We are?

Yeah.

Okay. ... You got the Docking Module Checklist?

No, I don't think --

You got it, Deke?

No, I'm not supposed to have it. ...

...
Okay. Let's get this - DOPPLER TRANSMITTER, OPERATE ... 

Okay ... 

... about the attitude. ... verify the following items - it says, "All items are secured." The O₂ REGULATORS ... they OFF? 

You got them. REGULATORS A and B are OFF. 

Perform hatch 2 closure. Decal, step 1 to 4. 

... we can close the hatch. 

... the latch ... 

... I suppose. Better get the hatch ... 

... better close that from the inside ... 

Yeah. ... 

Don't - don't pull ... the umbilical. 

That's below ... 

Okay. 

... 

Yeah. 

Supposed to be on panel 900. 

... close that vent valve ... 

Oh, the vent valve should be closed. 

Yeah. Yeah. 

Yeah. I thought you were talking about ... Yeah, I ... There, got it closed. ... got a problem.
CMP: Yeah. ... got a problem.

16 47 31 DMP: ... Okay. Now we close the hatch.

ACDR: Number 1, ... valve ...

CMP: I'll tell you one thing, if they don't tell us to pull those umbilicals, we're going to pull them anyway.

ACDR: Yeah. Here. Even though the ... up here.

CMP: Yeah, I know. You never know what ...

16 48 02 DMP: Okay, old DM, goodby. Okay; closed.

CMP: Good.

ACDR: ... hatch ... cable bag on top of A-1.

DMP: Huh?

ACDR: Yeah, bring that bag here.

DMP: Okay. Got it.

ACDR: On panel 900 --

DMP: ... as soon as I get the ... here. Okay. I'm on panel 900. Panel 900.

16 49 04 ACDR: DM VENT ISOLATION, OPEN.

16 49 07 DMP: ... OPEN.

ACDR: DM VENT to VENT.

16 49 09 DMP: DM VENT to VENT. Okay. ...

ACDR: On panel 274, circuit breaker DM POWER, OPEN.

16 49 27 DMP: DM POWER A and B, OPEN.

CMP: Is that all?

ACDR: Yeah.
ACDR  Okay. Install, unstow hatch 1.
CMP  Yeah. I'll do that. Okay.
DMP  Right, ...
CMP  Yeah. ...
DMP  Okay. Boy, I'm really sorry that's gone. ...
CMP  Yeah.

16 50 13
DMP  They don't say disconnect umbilical.
CMP  No.
DMP  ...
CMP  No. It's really - The only thing is you have to go back ... I'd ...
CMP  Want ...?
DMP  Disconnect ...
CMP  ...
DMP  Yeah. ...
CMP  ... before we ...

16 50 53
ACDR  ... Hey, Deke?
DMP  Yeah.
ACDR  ... not going down right away, is it?
DMP  Well, not before ...
CMP  It's going down, though.
DMP  Yeah. A little ...
CMP  Yeah, Tom, ...
DMP  ... wouldn't make a difference ...
ACDR ... 
CMP We're going to turn all that off ..., though.
DMP Oh, I see. ... --

16 51 32 CMP Turn it off at 197:20. But I'll tell you, I'm going to ... turn it off ... 
ACDR Going through with the checklist? I'll see. Yeah. Hatch 1 pressure integrity check. ... 
DMP Okay. ...
CMP ... 
ACDR Yeah. ... 
DMP ... 
CMP Verify - Yeah, it's coming. 
DMP Okay. ... we've lost all of our ... (laughter) ... all over ...

16 52 38 CMP As a matter of fact, Tom, we were wondering if ... checked ... 
CMP ...
CMP Yeah. 
ACDR Let's see, we got 3 hours ... 
DMP All right. ... 
DMP ... 
ACDR Set the HIGH GAIN on ... 
DMP Okay.

16 53 54 ACDR Pitch, minus 44; yaw, 193. 
DMP Pitch ... Now let's see ... ... 15 minutes? 
CMP Yeah. ...
DMP: How you doing?

CMP: Oh, I'm ... I got one of them, though. ... we just take one of them, okay?

16 55 41 DMP: Okay.

ACDR: What we got, 7?

CMP: We got 4. I just ...

ACDR: All ...?

CMP: Pretty ... for the ...

DMP: ... interesting.

DMP: ...

16 56 27 ACD: That ain't going to hack it, Vance.

CMP: Huh?

ACDR: Here, look at the ...

CMP: Okay.

DMP: ...

CMP: We got two more. You want them?

ACDR: Yeah, bring them here.

16 57 05' DMP: Okay, here's your ...

CMP: Thank you.

ACDR: What is that? ...

DMP: ...

CMP: Wonder if ...?

ACDR: ... down here?

DMP: ...

538
Think I already did it.

Got it? Okay ...

Tom?

Yeah.

Give me the scissors. I've got to cut a wire here that's ... just a little.

Go ahead.

...

Hey, there's a wire in here that I have to cut.

Cut it.

That's a good one.

Got all fof them?

Yeah. Now let's get the hatch.

... help ... that, Vance?

Oh, don't think so. Well, we'll wait and see here.

... all around in that hatch. Push. Yeah, let me help you with it. Okay. ...

Yeah, I know. Got a Kleenex? ...

... Let's see ... Here's one coming up.

Okay.

... checklist?

... we had it ...

... the right page.

Yeah, it is the page that ... hatches ... first part ...
... really works ...

That's good.

Yeah.

Finished?

Not quite.

Can I help you any?

...

Okay; the PRESSURE EQUALIZATION valve is CLOSED. The ... locked and all the valves look good. ... we're in good shape.

Let's see, verify pressure integrity ...

Yeah.

Supposed to verify pressure integrity ... --

I know. You said ... decal.

... the checklist. It's in the ... here. ... Is that it? Huh? Which checklist ...

Uh huh. How about - I know how to do it, but how about checking the pressure.

Pressure.

Yeah. And also DM VENTILATION.

... VENT valve?

Huh? We got it.

...

Okay. How about over in --

Yeah. That's probably where it it. ... the last thing we really want. ... had it last ...

And I put it ...
DMP The thing is ...
17 03 22 ACDR ... put it up here ... had to get up ...
DMP Okay. ...
CMP Well, while you're looking, why don't I proceed ahead, and ... check it ... down ... down ...
DMP Well, ... get up there, you know. ...
CMP Oh! Here it is. Never mind. I think we still have to find that thing but - here's, "Verify cabin pressure ... 4.7 to 5.3."
ACDR Got it. ...
17 04 42 CMP Okay. TUNNEL VENT for 30 seconds.
DMP ... Over here, Tom.
ACDR What?
17 05 47 DMP Yeah. I wonder what ... ...
CMP That ... cabin pressure ... Well, I guess, the O₂ FLOW HIGH ...
17 06 05 ACDR Try her anyway. ...
17 13 53 ACDR Hey, Crip. ... He's off.
CMP He's off?
ACDR ...
CMP No.
DMP ... make sure it retracts.
ACDR ... ... Wait, wait, wait, wait. ...
DMP ...
17 14 49 DMP It's not on yet.
18 02 59 ACDR Right. Good. Very good. ... Yeah. Yeah.
CMP ... rack.
ACDR What?
18 03 28 CMP ... here. ...
18 05 46 ACDR Right here.
CMP Okay.
DMP Okay.
18 08 06 CMP Maybe it was. Is that ... 
DMP You ...
CMP Okay. That's fine. 
ACDR All right.
18 10 11 CMP Okay. That's good. ...
18 16 34 CMP Okay, Crip. See you there.
DMP ...
CMP ... ... down to 6.
DMP ...
CMP 6.
DMP ...
18 19 53 CMP Oh, it's - it's on their plane, I guess. Pitch and yaw's ... Yeah, here it is. Minus 53 pitch, and yaw's 162.
ACDR How do you read, Vance?
18 20 11 CMP Fine. Yeah.
18 22 18 ACDR Testing. Testing ...
CMP

ACDR  Yeah. I've got to get ...

CMP  Okay.

CMP  ...

18 24 14 ACDR  ... Yeah. ...

CMP  ...

ACDR  Okay. ... ...

CMP  Well, yeah. ...

18 24 48 ACDR  Let's see, ...

ACDR  ... Let's see, ... Let's see, which ...

18 26 44 CMP  ...

ACDR  ...

CMP  ... reverse ...

ACDR  ... We're ready.

CMP  ...

ACDR  All right.

18 27 38 ACDR  Are you trying to get down?

CMP  Huh?

ACDR  You trying to get down?

CMP  What?

ACDR  Pitching down?

CMP  Yeah.

ACDR  Got your verb?

CMP  Yeah. I got it.
... install these things.

ACDR You've got all --

CMP You've got ...

ACDR You've got all these things ...

ACDR There ain't much more left, is there?

ACDR Have we switched to high gain yet?

CMP I pulled it up; ...

CMP Okay. Pitch up?

ACDR Yeah, ...

ACDR Have we switched to high gain yet?

ACDR Okay.

ACDR No, you sure ... a lot of ... steady. That it?

ACDR Oh, boy. ...

ACDR You don't have to do that.

CC-H Be advised I'm reading you pretty weak. I guess your mouth is a little bit away from the mike there. Probably kind of hard to do it. We're about a minute from LOS, and --

ACDR Yeah.

CC-H -- see you at Rosman here - correction, see you at Newfoundland in about 8 minutes.

CC-H Somewhere along in there, it'd probably be better to wait --

CMP ... do that.

CC-H -- until you get to Madrid, I'll give you an update on your - your DML - well, I'll give you the DML pad.

CMP Okay. Well, pitch is down.
18 37 54 CMP Yeah, if we could get that before we get buttoned up in suits - -

CC-H Well, I - I've got it whenever you want to - got a convenient time to copy it.

18 39 06 CMP Okay; ready to copy the - DML pad.

CC-H Why don't we - we'd better - we're going over the hill here. We'd better wait until we get to Newfoundland, Vance, I'm afraid. It's 6 minutes from now.

18 39 17 CMP Okay.

18 41 38 DMP Okay. ... check.

18 43 41 CMP He should have ... off. Tom, if you can get the ... off temporarily.

18 43 53 CMP Off. Uh-huh. Change the other one. See? You get a - -

ACDR Let me know when you're ready.


CMP Okay. You've got to pull that thing off to start with.

DMP ... twisted or something.

ACDR Got it in? Finally got it off, huh?

ACDR ...

DMP ...

18 44 32 CMP There you go.

DMP Okay. ... lift up. You can't see that God damned thing in there.

CMP Maybe I can get it off ... 

18 44 56 DMP Hold it, ...

ACDR What?
Tom, your suit's ...

Yeah, ...

Here it is if you want it off. ... ... the helmet ...

--- Houston. We're AOS through Newfoundland. Should be with you ... of about ... with the ATS.

... O₂ is off. How do I ...

I don't know.

Apollo, Houston we're with you through Newfoundland, and if you're reading good enough, we can go ahead and try to get this pad up.

Okay. Stand by.

Okay. No rush.

What pad's he on?

Let's see. I think it's ... I don't know for sure. ...

Okay.

Hey, Vance, push on it ... I think that's ... ...

It ... off.

Yep.

...

Okay. Let's go on and ...

Yeah.

Okay. Why don't you ... off?

Wait a minute. Let's get this set up first.

TIME SKIP
Wait 15 seconds. You want CMC, HOLD, 5 and 1.

Understand.

All right. ...

Okay; and we're going to 210 on the 180 - 180 to go.

All right. ...

I'm going to have to read that.

Read that. At 180, coming in about right. Looking good. Okay. 30 seconds.

Yeah.

Okay.

I'll give you a countdown.

...

20 to go.

20 to go. Continue looking good ...

10 seconds to go.

Yeah.

I'm going to give you a mark.

All right. Stand by.

Okay. Just about ready. 4, 3, 2, 1 -

MARK. Beautiful.

There she goes.

Okay. That thing ...

...

Okay. Attitude ...

Right.

ACDR

CMP

ACDR

CMP

ACDR

CMP

ACDR

CMP

ACDR

CMP

ACDR

CMP

ACDR

CMP
ACDR  CMC, HOLD.

CMP Now.

ACDR Okay. 5 and 1.

CMP ... You see it?

DMP It went out to the left there.

CMP Okay. Need a hack in 1 minute, Tom.

ACDR Okay. I'll get a hack in 1 minute. FDAI 5 and 1.

CMP 5/1?

ACDR Yeah.

CMP Okay; we're waiting for it.

ACDR Okay. Okay, at 1 minute. It's 37, 38 seconds. Flip those PYROs, OFF, real fast ...

CMP ... okay.

DMP I'll be a ...

CMP Okay. And got to search for it, I guess.

ACDR Okay. At 1 minute, Deke, CAMERA, on.

CMP ...

ACDR Stand by.

19 48 06

ACDR MARK it, 1 minute.

CMP Okay. She went off real good, Crip. We don't see her in the window yet. We went to HOLD at 15 seconds.

CMP I - we want to get those pictures though, too.

CMP I think I'm going to have to go right. You can't see it out of any window, huh?

DMP No, I don't see --

ACDR Nope, I don't see a fucking thing here.
Well, let's see. I think it's to your left.

Okay. Our pressure's good. Want to pop off these suits and look for it.

Our pressure's good.

Well, I don't know where to look.

... better look out ...

I'd rather kind of look for it — Well, that's right, we should pop off here.

Okay, Crip. Pressure's looking beautiful here. ... pop these suits and helmets and try to look for the bear.

Okeydoke.

It might be to your left, but I don't know.

Okay.

Okay.

Okay.

That's where it was the last time —

Yeah, on the left. Along with ...

Yeah. Okay; I see it.

Okay.

Go get a —

Okay. Master alarm; it's O2 HIGH FLOW. We'd better watch ...

Yeah. That — that looks like ... circuit breaker.

Yeah, circuit breaker.

...

Huh?

Okay, Tom, would you ...
Okay; we're a minute from LOS. Our next station contact will be Goldstone in 18 minutes. That's at 199:46. Good luck on spotting it.

Okay. We got it now, Crip.

Very good.

He has trouble seeing them.

How's it going there?

No, I see them ...

Oh, I'm sorry. Now you see them ... The reflected sunlight in this son of a bitch looks like an earthshine.

Not in the right direction.

A little reminder, when you get to it, to get the SUIT CIRCUIT RETURN, OPEN, but no - no rush.

Turn on the which?

All the way?

Suit valve?

No.

... RETURN valve. We monitor it CLOSED now. That was the reason for the $O_2$ FLOW.

Okay.

Okay. I hope we can ... I got it.

Yeah. Camera's running.

Okay. And I'll get that SUIT CIRCUIT RETURN valve.

Okay.

...

I should have ...
... try it. Yeah. Okay; I don't have any ... I don't have any at all.

No.

... wants --

Looking down on Earth, to check on my pitch just like that --

Not even a hint of a --

That's right. ... make sure I got the right one ...

No.

That's right, man. It wipes you out completely.

Yeah. I don't have any.

(Laughter)

See, what I was - what went on on that first ... docking ...

And the second one.

Hey, Tom, how long did you keep it heads up?

Okay. For 8 minutes.

Okay. Now it's holding very steady. We got it.

...

That worked real good. ...

All righty. ... Go ahead and get your SECS LOGIC, OFF.

Okay; understand. SECS LOGIC, OFF ...

...

God damn. That was fun.

Circuit breaker CSM/DM FINAL SEP, OPEN.
That COAS is just... camera.

... nobody ever had this problem before.

Haven't had the --

Haven't had the problem all the time, but ...

Well, but they gave him a filter. Would -- would that help?

No. Won't help ...

... suppose to have ...

I think it looked like it was going to have ...

Yeah.

... right direction ...

I guess the Hasselblad is ...

No, I got it over here where --

Let me help.

(Laughter) I'll - I can get it.

... look ...
Shoot one out your window?
Well, no. I can try it, but I'll have to turn these lights...
No, I don't want you to do that.
... your hand away.
...  
Hold it to the left a little.
Yeah.
Deke, there goes your burn.
(Laughter) Yeah. ...
Sure, Deke?
Okay. Well,...
Okay. ... DAC.
DAC. Okay. Configure DSE LOW BIT RATE, FORWARD ...
DAC off? DAC off, Deke?
Yeah.
Hey, you know, it's kind of --
... Why don't you put all of it in that.
-- got to push it down. I don't know, but I think you should push it down. That's probably ...
... ... that's beautiful.
... the right gimbal lock.
Looks good.
Okay; look ahead...
ACDR  ... further down and get that DAC off before we get the SECS PYRO at 8:30 ...

19 57 56 ACDR Okay; VERB 48: 11102 [sic] ... 11102, ... Oh, hold it, hold it, hold it. 11002.

CMP Yeah. ...

19 58 17 ACDR Let's see, ... CMC, AUTO and VERB 49 maneuver to the DML pad attitude ... Okay; this is it. Okay. Roll plus 358, ... 351, ... 003.

DMF ...

CMP PYRO ...

DMF ...

ACDR ...

DMF ...

ACDR Yeah.

CMP Verify ... --

DMF ...

CMP Oh, yeah.

DMF Oh, okay.

CMP ... put it.

19 59 45 ACDR ... CABIN PRESSURE INDICATOR, verify greater than 4.7 ... EMERGENCY CABIN PRESSURE on BOTH. SUIT CIRCUIT RETURN valve ...

CMP Okay.

20 00 08 ACDR Okay. 99:35, G&N OPTICS, ON. P30, verify DML T_i and delta-V.

CMP ...

ACDR ... the DM ... Yeah, that's it. 200, 00, 00.

CMP ... 38 - 39.
All right. Let's see. Why don't ...

... have to ...

Yeah. ... we'd have to be ...

I'm not ... I still ... I think if I turn up that ...

Yeah. That ...

... make it easier.

It really looks good up here.

I've got to ...

You there?

Yeah.
ACDR ... locked up on ATS.
CMP ...

20 06 27 ACDR ... pitch is minus 58.
CMP Yaw.
ACDR Yaw is 33\(^\circ\).
CMP ...

20 07 51 ACDR Yeah, that's good pitch we got. We got 300 ...
CMP ...

20 11 19 ACDR You got a map over there, Deke? ...
DMP ...
ACDR I don't have one. ... Vance, you have a ...

20 11 34 CMP Hell, I guess ...
ACDR ...
CMP I think it's over in ...
ACDR I guess - Why don't you --

20 11 47 CC-H Apollo, Houston. We're looking at some data down here that shows circuit breakers on panel 27\(^{\frac{1}{2}}\), for the DM FURNACE/CRYSTAL GROWTH are closed. We would like to get those opened, if we could, please. If you can reach them. We're about to go LOS, and then we'll have you again at Newfoundland in 5 minutes.

DMP ...
CMP ... Tom?
ACDR Yeah.
CMP ...
DMP ...

20 12 01 ACDR Yeah. We'll get a bigger bag ...
ACDR ... 18:10 ... should not be too long.

CMP Oh, we got about 19.

ACDR Where do you see that?

CMP ...

ACDR ...

DMP ...

ACDR ... Okay.

ACDR ...

20 14 14 ACDR ... all over ...

CMP ...

CMP ...

ACDR Yeah.

20 15 23 ACDR Shit! Do you know what ...?

CMP ...

ACDR ... that panel ...

CMP Okay, Deke, ... Flight Plan ...

DMP Yeah.

20 16 52 ACDR ... GET.

CMP ...

ACDR ...

CMP ...

20 18 04 CC-H Apollo, Houston. AOS Newfoundland, 7 minutes.

CMP ...
And if you gents find a chance to get those ATS angles, a pitch of minus 58 and yaw of 334, we'll be able to get you on the ATS and watch you burn.

Yeah. I had them in there. I hope you got it.

Okay, fine. Well, we're not quite there, yet. Thank you, Deke.

Okay. That 274 breaker I can't get at.

Understand.

TIME SKIP

Okay. Pacific Ocean - Ocean's just ...

Yeah. ...

All right, Deke.

I don't think ... work ...

...

Well, if you got to ...

...

...

...

What? Yeah. Two. Morning ...; morning and ...

Got to have - Do the ... power on.

...

...

...

You got the power on? ...

Okay.
Hey, ... down in here. ...
There it is. ... ...
...
21 03 06 DMP  Look ...
21 03 26 DMP  Let's see, ...
21 04 23 ACDR Hey, Deke?
   DMP  Yeah.
   ACDR  Where's that stuff for the electrophoresis ...
   DMP  I think I put them all up in ...
   ACDR  Yeah.
21 04 37 ACDR  ... electrophoresis.
   DMP  ...
   ACDR  ...
   DMP  ...

21 10 34 CC-H  Apollo, Houston. We are AOS through Orroral for 4 minutes.
   DMP  Okay, Crip. And we got the TV camera up and running.
   CC-H  Okay, great. We're talking at you on VHF now. As soon as we lock on with S-band, we're going to go ahead and command that camera on.
   DMP  Okay.
   DMP  ...

21 14 31 DMP  Well, okay, Crip. We're over where we think we ought to be, about Sydney, and we're in solid cloud cover here right now.
   CC-H  Yeah. Kind of hard to pick a cumulus cloud out amongst all the clouds then, huh?
Like to give you this quick blurb regarding the eddies I mentioned earlier south of Hawaii. It's known to have a series of eddies southwest of the Islands due to the current flow being broken by the Islands. And the size, and the number, and the extent of them are unknown. We'd like you to attempt to observe the orientation, the sizes, and how many you can see. You should have a chance to look at them on this upcoming pass across there at about 201:09. And we think it should be visible out of window 1.

We're also going to be, again, not beaming down this TV to Hawaii when we - when we come across there. So we can look at it later. We are 1 minute from LOS, and our next station contact will be at Hawaii in 14 minutes.

The ballpark on it's approximately 1500 feet. ... 250 ... too far off.

Hey, you know, we could ...
I did?

It might have been. I don't know.

Are really...

Have I got it on?

Yeah.

Oh, yeah. Yeah, here's ...

Yeah.

...

Okay, ...

...

... up here, look at the --

Apollo, Houston. Hello at Hawaii for 6 minutes. How you doing?

Okay, Dick.

Hi, Deke.
Yeah. The ball is okay now.

Right.

We just don't want to change that. (Laughter)

Okay. ...  

No kidding, Tom. We've got on a ... Vance ... coming up here ...  

Tape recorder. ...  

...  

...  

Got to find ... I think.

...  

I just ...  

...  

It's darker at times. Like over there, it's darker to me than over here.

Yeah. Like I get about a 38 here.

Yeah. And over here I would get more towards u - 35 or 36. What do you get?

...  

48 is closer here, but over here 47 is closer.

Okay. Let's get this cockpit cleaned up here.

Okay. Let me get this magazine shot.

Yeah. We've got to reconfigure. We've got a lot to do in the next hour or so.
ACDR: ... ... Yeah.
CM: ...
DM: ...

21 40 54 ACDR: I tell you, ... got one big bag big enough to ... I hope ...
DM: Yeah. I agree with you. ... 
CM: Okay.
DM: ... get a new mag on ...

21 41 19 CM: Okay, sure.
DM: ...
CM: ...

21 42 27 CM: I got to have gyres and stuff. ...
ACDR: ...
CM: ....

21 43 24 ACDR: Let's see. I'll tell you what, ...
CM: ... tape recorder ...
DM: ... Seattle ... ...

21 45 41 ACDR: Yeah.
21 46 23 DM: ... That's the bag[?] right there, isn't it? ... bag[?] ... Know that? I don't understand that fucker. ... ... That's exactly what we needed, though. ... 
CM: Yeah.

21 47 59 DM: Okay.
21 49 09 DM: ... some of that stuff ...
DM: That'll get there ...
Well, ...

Apollo, Houston.

... Well, I guess ...

TIME SKIP

Tom, it's good ... Did ... that?

Get the ...?

Umm. ...

Do you have one of these ..., Deke? ...

The other one.

You want us to put it back, ..., all this?

Try to get ... in a bag. You all fixing to ... and all that?

Yeah. Get the ...

The best thing would be ...

... Hey, this is a bag full of garbage.

We can get it ... all the fucking bags.

I wish you'd look at this ... here. ... first.

Let's see, why - why don't you go back and ... that job that hasn't been ...

I don't know, but I think it's still around somewhere. ... make sure. Right here. That's the only reason I hate to take it out.

Coming ...? Okay. I took 12 ...

Okay.
<table>
<thead>
<tr>
<th>Time</th>
<th>Actor</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>22 44 00</td>
<td>CMP</td>
<td>Shit. ... Okay. We've got three shots of Australia ... and ... 12 in the checklist ... They were approximately ... of Australia and they ...</td>
</tr>
<tr>
<td></td>
<td>DMP</td>
<td>... God! Look at those ...</td>
</tr>
<tr>
<td>22 48 59</td>
<td>CMP</td>
<td>Deke, did you ...? There's no evidence that that ... get out and ...</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>But - I'm forced out of ... stereopair of ... and they ended up ...</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>Would you take this?</td>
</tr>
<tr>
<td></td>
<td>ACDR</td>
<td>...?</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>Yeah. This is a ...</td>
</tr>
<tr>
<td></td>
<td>ACDR</td>
<td>...</td>
</tr>
<tr>
<td>22 50 43</td>
<td>ACDR</td>
<td>... anyway it would be possible. ...</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>Go ahead, Tom.</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>What's that island? Okay. Do a ... Got ... of an island. Got water ... off the island.</td>
</tr>
<tr>
<td></td>
<td>ACDR</td>
<td>... the black one.</td>
</tr>
<tr>
<td></td>
<td>ACDR</td>
<td>Why don't you just toss me the black one. ...</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>... let you know. We're over the Seattle area, ... photographs ... snowcapped ... stereo frames ... ... glaciers and firn lines and sediments - describe sediments in the waters of Puget Sound. ... gyres there? ... give you an idea of all the things ...</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>I've looked at it, and I've decided that if ..., I can't describe them too well. And I've just got to take more pictures in the right ...</td>
</tr>
<tr>
<td></td>
<td>ACDR</td>
<td>Ready to ...?</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>...</td>
</tr>
<tr>
<td>22 54 15</td>
<td>ACDR</td>
<td>... off.</td>
</tr>
</tbody>
</table>
Stereopair of thunderstorms over the mid-Pacific at 202...

Got another big thunderstorm ... ... what rev ...

123-24.

Well, that should get it.

...?

Yeah. ...

You know, I think we’ve made several passes ...

... you’re right.

I better get ...

Well, let’s see; if we were going right side up, let’s look down here, right? ... Tom.

Yeah. If you look ... south ...

This pass ... There's a big one up in the ...

Let's go down to the south.

One thing that caused the urine dump to go ... was ... while we're eating.

Is that right.

The outside ...

I noticed that thunder clouds come out of ... I mean out of eddies - or cumulus-type clouds. Okay; just got a - an eddy. Should read at 202:38:00. Right there, I got it in front ... it's right there. Sort of a ... of it. I see a slight extra ... of it. So light I can't hardly describe it. The - one other thing I noticed is out of the sky I just took a picture of there were cumulus clouds eminating out of the sides or the interior of it. You'll find that with several - I - I said sky, it ought to have been eddy - several eddies interior.
There's another big - Hey, look at that. That looks like a hurricane. Good Lord! Great big storm in the middle of the Pacific here, coming up at 202:38:10. Look at that swell. Okay; I got the center of this tremendously large thunderstorm. I don't know, it might be 100 kilometers across. Virtually, I can't even see the extent of it; more than that, I got a stereo ... the center.

Yeah.

Okay; the time on that was ... 40:55. Oh, I thought you were just ... Got a picture of an island ... 202:41:10. ... sunglint around it. ... beautiful island with sunglint around it.

Looks to me like ... fixing to ...

Okay. That's 32 and 33. Typical, rather linear cloud pattern ... west. I see this quite a bit. ... water current. ...

... I can sit here and ...  

... Vance.

Oh, yeah.

Yeah. I can see the whole thing from here. ...

Yeah, that worries me. It helps to see them right side up. ... Good.

Looks like ... here.

...

... looks like ... I think it indicates that ... That looks like a ... itself. It's got a ...

Yeah. ...

Hey, Deke.

Yeah.
We got to identify ...

Looks like it may be a "mega-eddy," huh?

Yeah.

Deke's picture was taken ... 48:45 ...

Huh? ... work better?

... turn it ... And could somebody ... get a ... place for ...?

I don't know.

...

I really don't think so. ...

...

Okay. ... get it.

Okay. Here comes ...

You've got the ... You've got the ... all over ...

Okay.

... right now. ...

How about way down south?

Way down there?

Well, we can ...

Yeah.

...

Well -

...

Right here.
ACDR  I still don't - don't think the camera's taking good pictures.

CMP  ...

ACDR  ... all that water down there.

23 15 08 CMP  Took a picture ...5 of the Canadian Rockies. Snowy-area stereopair ... looking for glaciers ... Canadian Rockies ... glacier.

ACDR  I was looking for one.

23 15 54 CMP  Okay. I see a glacier.

DMP  ... There's the firn line.

DMP  Yeah. There it is.

CMP  Okay, Deke, set the ...

DMP  Huh?

DMP  ...

CMP  ... first is at 202:40 ... ... a big farming area. Suppose that's a dam?

ACDR  No, that's Calgary right there.

DMP  Is that Calgary?

CMP  ... shot a glacier ... just west of Calgary.

CMP  ... apart.

ACDR  Yeah. Okay.

DMP  Well, ...

ACDR  ... You've got to get ...

DMP  ... go through that ...

CMP  Hey -

23 18 49 ACDR  ... go to the right ... that.
Okay. We're ahead of the ... I think.

Okay. We're ahead of the spacecraft.

... got it.

... Yeah, we're supposed ... that one.

Look at that cloud down there - that dark cloud.

... Yeah.

You know, Deke has a ...

Yeah. I doubt that you ... changing ...

Yeah.

You got to move that - got to ...

Get a chance to go down there?

Apollo, Houston. Hello at Bermuda. How are you doing?

Just super, Dick.

# # #
DAY 205

00 28 50 CC-H Apollo, Houston. We're about a minute and a half from LOS. I'll call you at Rosman at 204 plus 32. You got four good gimbal motors, trims are okay. Everything is looking fine. We'll see you after the burn.

CMP Okay. Glad to hear it's looking good.

CMP Thank you.

CC-H Okay.

CMP ... Okay. I got ... Check the ...

CMP ...

ACDR ...

00 29 38 CMP Right.

CMP ...

CMP ...

ACDR ...

00 31 07 CMP ... it up.

ACDR ... up.

CMP ...

ACDR That's ...

ACDR ...

CMP Huh?

ACDR ...

00 31 57 CMP ... second burn.

00 32 43 CMP Okay. Normal.

ACDR ...

CMP ...
Jesus Christ! (Laughter)

God. Where did all the water come from? Okay. 

Okay. Got it. Yeah. Okay. Deke, you ready? ...

TIME SKIP

Apollo, Houston. We're 2 minutes from ATS LOS.

What - what's ...

We'll see you at Goldstone in about 20 minutes. See you there.

Okay, Dick. Incidentally, we were just commenting - this is not - this is a sure good attitude for the Doppler experiment, but we kind of need a periscope for Earth obs.

Roger. FAO was sitting here thinking the same thing, probably.

Kawhia Island administrated by - administered by New Zealand and claimed by the U.S.

Is that right?

Yeah. Because it's small.

Wonder if I'll get a chance to see New Zealand again.

Probably not.

I got some apricots this morning. ...

Okay. ...

... call that ... because that's the ... that valve ...
ACDR  Let it sit here --
CMP   I can only ... 
ACDR  -- until it's better.
CMP   Yeah, but it's not right.
DMP   Tom. 
ACDR  Huh? 
DMP   ... 

02 00 53 CMP   Okay. I'm going to start ... here. ... 
CMP   ... Start the ... 
CMP   Start the ... 
ACDR  ... 125 - 126. 
CMP   Okay, on rev 126. 

02 02 28 ACDR  We're right over Albuquerque, Vance. South of ... 
ACDR  Was there a ...? Was there? ... 
CMP   Well, there's ... looks super. 
DMP   Yeah, let me take a picture of it. 
DMP   ... uncorrelated. 
ACDR  Well, there's one. 
DMP   ... 
ACDR  You got a rev 134, 35 ... area here. 
CMP   ... 
ACDR  Right. ... 
CMP   Let's - Let's ...
ACDR: I don't know.
CMP: I don't know ...
DMP: Okay. ...
DMP: ... got through that. ...
ACDR: ... set them up.
CMP: Camera - the mapping camera's all yours.
ACDR: ...
DMP: ...
ACDR: ... You got this volcano. ...
CMP: Can I get that to move?
ACDR: ... Maybe this one.
CMP: Never have seen the Falkland Current, have we?
ACDR: Always been cloud cover.
DMP: Anybody got a record they want to ...?
CMP: No.
ACDR: The other side of that country and western, that's ...
DMP: ... got a better one instead of that country and western.
ACDR: No. That's one of those - ... start out with a country ...
DMP: ...
USA: (Music)
CMP ... country and western ...
ACDR I don't like it.
CMP I don't either.
ACDR Yeah. Got some good country and western.
DMP ...
ACDR Yeah.
DMP ...

CMP That's the first one out of there.
DMP Okay. Well, well, let's see here ... one I haven't heard. ... here, that one yesterday. Let's go for rock and roll, and country western ...
CMP ...
ACDR ... rock and roll.
DMP Try that one.
CMP ...
DMP We heard that one.
ACDR ...
DMP Well there's ... No, on the other one I ... Conway Twitty, right?
ACDR Yeah. Let me get one on. ... 
DMP Vance, you know where it is?
CMP Huh?
DMP ...
CMP Yeah. It's ... down in the other one.
DMP Well, I've got ... Okay, here's ...
Oh! Vance, I want you to check something before we ... tonight. I got ... clock ... --

All right.

ACDR Right. The clock's in the bottom of the ...

Yeah. But you got to make sure.

ACDR ... looks like a couple ... backed off. ... backed off.

Where - where'd you put ...?

Huh?

Think it was the ... in the bottom of the ... Is it down here?

Yeah. You know, those twist off ...?

Yeah.

(Whistling)

What did your - what did you hand him?

Oh, what was it? Conway?

Yeah.

No. Go ahead and play yours. ... put it ...

Tom.

(Whistling)

ACDR Huh?

It's okay. I wondered if --

ACDR Oh, no. I'm in this one down here. It's back this way.

... coming in? See ...

576
ACDR  | Yeah.

02 12 27  CMP  | Hey, you're right, by golly. See I'm giving --

ACDR  | Look, one of them's backed off. That's probably ...

...

CMP  | ...

DMP  | Vance, you got a ...

ACDR  | I think it's fully backed off.

DMP  | ...

ACDR  | ... looks like it.

CMP  | Yeah. Yeah. ...

ACDR  | ...

CMP  | We better tape them again tomorrow too.

02 13 14  ACDR  | Yeah. ... In fact, why don't you just put a piece of tape on each one of them.

CMP  | Yeah.

ACDR  | I think ... is fully backed off.

CMP  | ...

ACDR  | Either a ... --

CMP  | ...

ACDR  | -- the whole thing just comes ... ... the whole thing just comes out.

CMP  | Yeah. This one is ...

DMP  | ...

ACDR  | Like what I said, if you don't bag them.

CMP  | Yeah. Here are ...
ACDR With this crazy arrangement ... can take a rest. They might want ... themselves ... all fixed ... Think we might get a rest after this ...?

CMP No. We didn't ... it any.

ACDR ...

CMP I don't think we'd better ... My wife wants to take ...

USA (Music: In the Mood by Glen Miller)

02 14 55 CMP Is that Conway Twitty?

ACDR No. No, that's not Conway Twitty. No way. I heard that music before you were born here, Vance.

CMP (Laughter) Oh, I remember that music very well. That was the music when I was in high school.

USA (Music: Sentimental Journey by Les Brown)

ACDR I remember that one.

DMP How do you like that one? Isn't that great?

ACDR Yeah.

DMP Les Brown.

ACDR Yep. Sounds of renown.

02 15 47 DMP We get anything for Farouk over Egypt down in there ...?

CMP Yeah.

ACDR We had two.

CMP Yeah, we had good - two good passes over Cairo.

ACDR Yeah.

DMP ... Ain't he great?
CMP Is that the book?

DMP Yeah, ... 

ACDR ... 

CMP Oh, I think most people like the music that - that they - you know, when they were - that they heard when they were about 16 to 25, something like that.

DMP Yeah, ... 

CMP I felt that way particularly. I - I kind of like - like it all, most of it.

DMP ... 

CMP I - I like modern music.

DMP I don't like that real hard rock.

ACDR No. I don't care for that, not at all.

02 16 14 DMP I like John Denver ..., Gordon Lightfoot.

CMP Only thing I don't really like - a few things, I don't like real classical things like opera, and all that kind of hog crap and - because I don't understand it; Brahms, things like that. And the other thing I don't don't like is the kind of country that you get in Nashville.

DMP Oh, yeah. That's - that's kind of - although some of that - that Nashville grass ... that we have ... you know some of that Nashville grass ... Couple of the ... that I ... Oh, you got a ... That looks like the - -

DMP Oh, yeah. That's - that's kind of - although some of that - that Nashville grass ... that we have ... you know some of that Nashville grass ... Couple of the ... that I ... Oh, you got a ... That looks like the - -

02 18 20 ACDR You suspect that's a cyclone?
Yeah. I'll bet from - real up high it looks just like a cyclone, kind of a - could be a - I'll bet it's that same thing we saw earlier. It looks like a possible hurricane.

Yes. Particularly ... Take a look.

We ought to find out. ... this point, 205:56.

All right, Vance. Take a couple of it - about 100 miles across, I think ...

Time it. ...

It's building up on the outer edges. The whole thing narrows - weather satellite in the ... Pacific.

I don't know, it appears to be a - typhoon area?

Well, yeah. ...

Well, I think one thing about modern music is, that up till 10 years ago they only played about 10 percent of the classical sound. They only played all that modern guitars and stuff. All over - Well, I guess it was such a vibrating sounds of ... I think that really gives it a ...

Here, I'll put this in the ...

Which way is ...?

I don't know.

... Fault.

... 

... and cotton.

Oh, yeah.
There's the Delta.

Right.

... headed towards the Fault?

Nope. Not yet. ... coming up.

... passed the ...

Yeah.

Ah, here's the coast.

I got photographs.

Where is it ...?

Oh, no. No, ... Italy, the Adriatic ...

...

Yeah.

It's the West Coast ...

Oh, is it?

...

Yeah. ... Must be southern California.

Apollo, Houston. AOS at Goldstone for about 4 minutes, and about 2 minutes — —

Apollo, Houston. I'm back up. We're about 30 seconds from LOS. Give you a call at Quito in 8 minutes.

Okay.
ACDR Get up there. Somebody else take this light for me. But don't ... hook it up ...

CMP ... some more if you want it.

02 26 26 ACDR No. It's all ready ... About wrapped up in the ...

CMP Okay. ...

ACDR I'll put this black one over here. ... that book ...

... on it.

DMP Really got a ... on 35. ...

ACDR ...

02 27 16 ACDR Well, let's see, what's next on the regular Flight Plan? ... 5, ... CMC MODE, FREE; P52 ...

DMP Did you ever watch - notice the ones that come up the side?

ACDR ...

DMP We just haven't been in a good attitude to see.

CMP Oh.

DMP ... just look out there. All the - -

CMP How about lightning? ... - -

DMP Oh, there's a lightning ... out there, see it? It's going all the time.

ACDR Yeah. I haven't seen it ... Put it - put it right up there ...

DMP All together the ... time was - I'll tell you what, ...

ACDR Go ahead.

CMP Together.

DMP Together?
Yeah. We may as well eat.

Okay.

9:30.

Well, it's been about 5 hours since we had lunch.

If we messed around much later, it --

Deke, why don't you get over in this ... the Sun comes up, you'll be over here, okay? Get over here. Okay, ... ... get up here.

What? Yeah. Oh yeah. Where would you like it? You too? ...

Damn, somebody's getting a ... here.

... right here. ... --

Hey, Tom, while you're there could you grab the tray?

-- something for this.

Oh, you're going this way, that's right.

I guess the first thing ... If I have a - trying to get a lot of things ...

TIME SKIP

Yeah. That's ...

... (Laughter)

That - that's something ...

Okay. It was ... 07:19:28 [?].

I think ... 07 ...

Apollo, Houston. Goldstone for 2-1/2 minutes.
CC-H Roger.

DMP Hey, Dick. You with us?

CC-H Yes, sir. Go ahead.

DMP Okay. We just saw what we think is a possible volcano. I don't know ... down there or not. ... 207:19:20 - a very large - kind of a mushroom-type thunderstorm-looking thing with a large stream of gray-brown smoke going downstream, mixed with white. ... volcano. ... horrendous oil fire. ... track that one for us?

CC-H Okay. We'll - we'll correlate that time and see if we can check it out.

03 55 26 CC-H Apollo, Houston. We're 1 minute from LOS. We're going to make this the last call of the - of the evening, so it's - we've certainly enjoyed working with you here on ASTP, and we'll see you guys when you get back to Houston. So everybody say, "Good night, Dick."

ACDR Good night, Dick.

DMP Good night, Dick.

CMP Good night, Dick.

CMP Good night, silver team.

ACDR Yeah. Thanks a lot for all your help. It was just tremendous.

CC-H We really enjoyed it. We'll see you guys when you get home. Have a nice splashdown.

03 55 55 ACDR All righty. It's been a real ball.

03 58 30 ACDR All right.

03 59 06 CMP Yeah.

03 59 24 CMP That's right.

ACDR ...
Good. ... Looks like we got wakeup at about 8:30, then we have ... splashdown at 4:30. Then it's another 30 minutes to get onboard ... That's about an hour after splashdown; so that's 5:30. ... to 5:30. That's 4 hours ...

04 00 56 ACDR Yeah. ...

04 01 06 CMP Yeah. Oh, I'm - I've been thinking about that.

04 02 12 ACDR Yeah. Those ...

ACDR That's the only thing ...

04 04 02 ACDR You know, we ...

04 08 33 CMP Yeah. I think ...

ACDR Yeah.

04 11 42 CMP Anybody - got a screen [?] cap in their pocket? We're - This one's got a hole in here.

CMP Oh, no. That's fine. You can get it out.

CMP Yeah, I guess you'd better. Whatever you think; it's yours too, I guess.

04 12 15 CMP No. All I did was pull the loose ends in. But ...

TIME SKIP

12 42 25 DMP Yeah, you can give me another one of those ... black ones, over there in the other one. Yeah, that's for - silver one, that's what matters ... black one. We need to dig one out of the bag over there. ... Huh? Yeah, I just brought up another bag for this stuff ... find it --

CMP ... in the bag?

DMP Yeah. ... stick that up here, Vance.

585
All right.

That must have been strapped on. Oh, that goes in the IF... ... yeah. Why don't you just ... big one up there ...

...

But I think it's straight up there.

Okay, yeah. ...

Well, of course, ...

I got to - I'll give you one in a second, Tom. ...

What time does it say that IF ... , Tom? Yeah. ...

Yeah. Say, you strap that one over here.

Most of that ...

Wos.

... 03?

Yeah. Should be. Let's see --

... A-9 ... A-9. We're in D-105 aren't we? ...

...

D-10's ...

That's right.

...

You got one over - far side there, Tom.

Yeah.

... back on top over there.

You are?
Oh, okay. See it in the corner there?

Yeah. You got that bag full, Vance?

Not yet. You got it ...

I don't ...

Well, wait. Why don't we have them over there?

I don't know. ...

Hey, how about a VERB 30?

That's this thing coming up.

Option 5.

Yeah. But it ... where you locate it ... the first two. Tricky ... - you're on that 10-degree deadband. ...

That's right. You're going to be ahead of the doctors.

Okay. ... Guess --

Well, ... says that --

Yeah, we'll get there. Except that, well, look at this thing logically, it's much faster ...

Oh yeah. Attitude, I think.
Okay. Got to do everything ... this morning. Right.

Final ... says you have to have a ... prescription for that ...

Okay. Tom, ...

Okay. ...

Okay. ...

... medication up there ..., water and ...

They - I - I had everything for supper and I had some ... Oh, well, ...

... he was using that one.

Probably. Okay. On the - PRD ... done ... 48314. And tell them that the purpose of PRD onboard ... my hair.

...

Whatever everybody else has got, I guess I got the same amount.

...

Yeah. I guess about 86 or something like that. I have a ... medium ...

... very much.

Drinking a lot. ... Never heard that - ...

Odd attitude, whatever - it's not ...

Yeah, yeah. Are we - ... Yeah. Of all the ... Gosh. It sure takes its time, but I guess it's going to get there. That's - we're supposed to do 125. That looks like ...
ACDR ... 

CMP ... 

CMP Got a long way to go.

13 00 38 CMP Well, Deke, like Crip said, "The party's over."

DMP Yeah.

CMP Tom's had a lot of these parties. We're on our first one.

ACDR ...

CMP Yeah. (Laughter) Yeah. ... There it goes.

ACDR Well, ...

CMP Guess that's the wrong computer. Kind of - Guess it's the attitude of - ... off of another attitude.

ACDR ...

CMP Yeah. Getting ready for ... Always thinking about that and, I guess, set out to do it.

CMP Okay. ...

13 03 10 CMP ... Now VERB 30.

ACDR ...

CMP Are we?

ACDR Well, ...

13 04 30 CC-H Apollo, Houston. We're AOS at Orroral. Have you for about 4 minutes.

CC-H Okay. If we could - down on panel 230 - get the UP TELEMETRY switch to DIRECT, please. And also, if we could have ACCEPT, we'll give you a state vector and also change our time over for PET.

13 04 49 CMP Okay. Got all those.
CC-H Could - did you get a time hack on when you started battery Bravo on CHARGE?

CMP Half hour ago.

ACDR Well, --

CC-H At least approximate.

DMP -- ... stand by a sec.

CC-H -- your NOUN 78's for this P20 option 5. It doesn't look quite right for us here on this attitude.

CMP Okay. 78 minus ... 5.

DMP ...

CMP All right, Crip.

CC-H Those look good.

ACDR ... doctor tell you this morning.

CMP Oh, yeah.

ACDR Let me trade places with you, Vance, get you squared away.

CMP The message you got from ...

ACDR ...

ACDR I'll give you a mark. Put it on 92:59, Vance.

ACDR ...

ACDR 92:59 ...

ACDR MARK it.
Apollo, Houston. We're AOS Quito for 3 minutes.

Loud and clear.

Okay.

Waste water's up, we don't have to do that. ... don't have to do that. Vance, are you going to shave? No, this is a good time for you to do it. I'll tell you what, you better go ahead and get that out of the way. ... vent. Okay, let's just wait until nighttime.

... Earth obs ... they have to get done today. But we're a ... damn weird attitude, ... recording ... recording for Earth obs?

TIME SKIP

-- and -- and ... 9 reads 87 ...

... don't know the angle?

-- stereo on that. Four shots.

... 91.

... recorder ...

Tape recorder's on.

Should be.

... on here. ...

No, no. ... another couple of minutes ...

0.0 ... 0.0.
TIME SKIP

14 14 24 CMP No, that's ...
ACDR ...
CC-H ...
ACDR Roger.
ACDR Okay. ...

14 14 54 CMP I got an ... - I got a --

The pass gets an update here.

14 36 06 CMP Yeah.
ACDR Houston, Apollo.

Okay. We're getting ready ... and going to have you at ... Orroral ... go ahead.

Crip. Do you have any updates on the times for the mapping pass 135, 136?

Don't believe 135 is a mapping. And ... 136 ... no update for them.

Okay.

Do you have a ball point ...?

We're going to lose you briefly here, ... go straight through. I'm going to get VHF through Orroral.

Okay. ...

No, I haven't got one. You want --

No, ...

Pardon? What can I do for you?
<table>
<thead>
<tr>
<th>Time</th>
<th>AC DR</th>
<th>CMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 37 29</td>
<td>I'll get it.</td>
<td>I - I suspect that it's in R-3.</td>
</tr>
<tr>
<td>14 38 01</td>
<td>... R-3? Oh, ... Oh, here it is --</td>
<td>No, wait; here it is.</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>Okay. Here you go.</td>
</tr>
<tr>
<td></td>
<td>AC DR</td>
<td>...</td>
</tr>
<tr>
<td></td>
<td>CC-H</td>
<td>Okay. We've handed over and we're back with you through Orroral Valley.</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>Okay.</td>
</tr>
<tr>
<td></td>
<td>AC DR</td>
<td>Yeah. ... 16.</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>Zero. ...</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td></td>
<td>AC DR</td>
<td>And the ZFF is stowed ... per Flight Plan.</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>Starting maneuvers to the - vis obs pass.</td>
</tr>
<tr>
<td></td>
<td>CC-H</td>
<td>I'm sorry, you were - you were unreadable. Say again.</td>
</tr>
<tr>
<td>14 38 33</td>
<td>CMP</td>
<td>Roger. We're starting - we are starting the maneuver to the Earth observation attitude.</td>
</tr>
<tr>
<td></td>
<td>DMP</td>
<td>Yeah. ... ZFF ...</td>
</tr>
<tr>
<td></td>
<td>CC-H</td>
<td>Copy.</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>Yeah. Why don't you give me your ...?</td>
</tr>
<tr>
<td></td>
<td>AC DR</td>
<td>46.</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>...</td>
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<tr>
<td></td>
<td>AC DR</td>
<td>...</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>Good. ...</td>
</tr>
</tbody>
</table>
Okay. Houston, Apollo.

ACDR

Go ahead.

CC-H

Okay. On the Doppler shutdown coming up. Do you want to give us a call on that on a specific time, or do I do it just at 94 and say 12?

ACDR

Okay. Call that out to me.

CMP

Doppler?

ACDR

Yeah.

CMP

Panel 230. DOPPLER RECEIVER, OFF.

ACDR

Okay. DOPPLER RECEIVER, OFF. Go.

CMP

Panel 274. CB UV/DOPPLER MAIN A, OPEN.

ACDR

OPEN. Disconnect the cables?

CMP

Disconnect recorder cable; stow recorder and cable in A-6.

ACDR

A-6, huh?

CMP

And you're supposed to stow the tapes and reels parallel to Y-Z plane.

ACDR

Okay. ...

CMP

Now, I wonder why that is?

CC-H

Apollo, Houston. We're about - about a minute from LOS and we'll see you again at Quito in 28 minutes at 94:32.

CMP

Cheerio.
... the reels in this damn little bag. ...

Okay. ...

We're all through with that?

We are through with the Doppler.

I hope.

A and B works good. ... I think it is ... Doppler ...

Okay.

Reel A, 13 plus. Reel B, 7 plus.

Okay.

Reel C is 11. Reel D is 12.

Deke, how you doing?

Yeah, I don't suppose you have to get back in ...

No.

Okay. Which way now? The axes - the rotation of the reels. The reels rotate around ...

... What, Y-Z plane?

Well, where do you get that?

Don't know.

The axes ... rotates ... That could be ... It could be handled ... way, or it could be done like that. Right? Which way ...

Y -- ...

-- like this?

No, like -- like this.

Towards this plane. ...
ACDR  Okay. Y - no, this plane is up.

CMP    Oh ...

ACDR  You got a ...

ACDR  Here's - here's Z.

CMP    Z.

ACDR  Here's Y.

CMP    Okay.

ACDR  So they have to stay parallel to that plane. So we - -

CMP    No, not - -

ACDR  Here you go.

CMP    Yeah? Okay.

ACDR  It's got to be like that.

CMP    Okay.

DMP    Okay. Junk. ...

ACDR  No, we don't have to stow it.

DMP    Think I ought to put my Velcro strap around ...?

CMP    I don't know.

DMP    Got some tape, though.

CMP    Got some tape. ... anyone find the tape?

DMP    ...

ACDR  (Laughter) We got to put this in A-6. The Doppler is shut down. ...

ACDR  Huh?

DMP    ...

596
ACDR Yeah. I was wondering what happened to it.

ACDR Yeah. Got to go on its side ... 

CMP And here's the - cable 30.

DMP Okay. ...

ACDR Okay. Let me show you how it has to go - it has to go - Okay. I'll do that ... Got to go like this. Goes like this.

CMP Everybody else get the tape? I'll ... out of the ...

ACDR First ... Huh?

ACDR That's - that's ... the cable. ... for the cable. Cable is ... 

ACDR ...

CMP Yeah?

DMP Oh, the cable doesn't matter.

CMP Let's go.

ACDR Maybe we only should carry one of them down there.

ACDR Yeah.

CMP ...

ACDR Okay. Let's ... the Flight Plan? 

ACDR ... I think I can ...

ACDR Vance, I think we ...

CMP Yeah.

ACDR Nearly in.

CMP Okay. Now.

ACDR Same thing as you did for the Doppler ... ...
Oh - well, but - Yeah. I don't have - a - Yeah. I got to find a home for it, somewhere.

Yeah.

...  

Hey, you're getting pretty close to your vis obs pass. They have pitch 15 and yaw 322.

Okay. Pitch 15 and yaw ...

plus 15?

Yeah.

Deke?

Yeah?

Did you stow that - Doppler recorder - -

Yeah. Yeah.

- - right place? Okay.

3 what? 22?

Yeah.

Yeah.

Visual obs, next thing.

Yeah, that's ... The next thing, CM height measurements. That's it. ... sunlight. I'm going to get another roll of film; this film is about out ... We got ... Let's see, ... 15's ... Oh hell, we got the whole thing for Earth obs all through.

Yeah. ...

... 8.

Yeah. Right here.

... 5, 7.
CMP Yeah.
ACDR ...
CMP Yeah.
ACDR ... have one of these.
CMP Yeah.
ACDR ... get filled out?
14 51 02 CMP Deke, you want your picture taken now?
ACDR I about fixed him. (Laughter)
CMP He didn't do it to me. I won't do it to you.
ACDR (Laughter)
14 51 15 ACDR Nikon film out of here. ... that Nikon real fast ... the whole role back on. In fact, we got color exterior. ... we have one roll of color exterior. Put that ASA 64 in, will you?
CMP ...
ACDR ... it right up.
CMP ... move over.
ACDR ... We aren't going to come back through here.
14 51 52 ACDR You know, ... we had that thing ...
CMP Yeah.
14 53 03 CMP Yeah. Hey, why don't you get that cue card. Grab that cue card, Tom, I got my ...
ACDR Okay.
CMP ... 250 ... f/8 ... About one and a stop - stop and a half ...
14 53 33 ACDR Now - now, now wait. You've got the same lens, the same 50-millimeter lens ... The only thing to do is ...
Yeah. But - but all our Earth obs book stuff, it was 250.

Yeah. But 50 ...

Okay; well, what've we been using with the black camera anyway?

... same thing ... 50 ...

...

Yeah. But there is a difference. The 50 ...

50 ...

Yeah. Right.

Yeah. And that's a stop and a half?

Yeah.

Okay. ... ready ... to go?

Yeah. ...

And it's daylight. Oh, boy.

... I don't either. ...

...

Okay. ...

Okay. We got ... set up. First one is 7-F.

...

... Nikon ...

... I'll take it over here ...

Okay, get - get the Nikon all set for ...

The Nikon's ready to go.

Got to reset that ASA on the ...
... Yeah. Okay. We're all set for the attitude.

Okay; would you like the ... or the black? You can have either one.

Okay.

First thing we're going to come across is the Galapagos. ... That whole - that whole thing ...

... time line? ... We go from 94:20 to 95:10. We got about ... The whole thing ...

... Boy, they sure crammed it.

Yeah.

You know, a thought too - might be to take - take a little Nikon shot out the window, exterior color ...

Yeah. That's a great idea. What we could do is take that ... down in the bottom of the ... it out.

This color film? Is that --

Yeah. Color - color of the water.

Okay. Recorder's all set.

I'm trying to pick up the ...

Okay. ...

Started at 7F at 94:30. ... the Galapagos Islands. ... water.

...?

Huh?

Hey, look. ... those clouds ...
... to figure out what it is.

Hey, look at the ocean ... quite awhile here.

Okay. I just put my pen down.

Yeah. We don't really get started till about ... 30. ...

Okay.

...

Yeah.

... camera, here ...

...

Well, also, you got to start getting rid of those films ... ... A-6 ...

All that stuff --

Oh, A-6, you said, is full.

Yeah. What we got to do; we got to take ...

Maybe we ought to just put it in ... right?

Okay. I asked ...

Yeah, we're ... I think, Deke.

...

I - well, yesterday we came on a Flight Plan place that said, basically, stow the film. And they had us putting it in ... 3 --

Yeah.

-- and A-5 ... there's no way ...
ACDR  ...  
CMP  Thing is, we can't have 'em fall down on us during flight.

15 01 30 ACDR  Yeah. I think, Vance, ... stow a bunch of that film in those ... and that's about it.
CMP  I think it's --
ACDR  ... TSB bags.
CMP  That's the way to do it.
ACDR  ... you're worried about those cables popping open --
CMP  Well --

15 01 43 ACDR  ... stuck way back there in the ... 15 minutes. ...

15 01 53 CMP  Okay, I'm going to try to ...  
CMP  What about ... Is that full?  
ACDR  No, A-3 ... put it all ... A-3 ... Let's stick it all in A-3. Everything ... in A-3.  
CMP  All right.

15 02 23 ACDR  ... stowed in A-3, and then after you get all that stuff in there and ... the rest ...
ACDR  Speaker box 164, 165.

15 03 00 DMP  Kind of like Soyuz; can't stow nothing to start with ...  
ACDR  You know, there's a ... on the ... on the outside area, out of plane ...  
DMP  Yeah, I know. ... looks at the angles here.

15 03 32 CMP  Okay. The - Hasselblad already's in A-3.  
ACDR  ... everything. Everything in A-3 ...  
CMP  Okay.
ACDR  Put all the rest of that stuff up against ... down there. ...
Yeah. ... one ... over there.

ACDR Yeah. ...

15 04 04 DMP Okay.

DMP Okay, I'm supposed to put - Hey, I'm going to put this God damn light thing back here with the --

CMP Okay.

DMP -- 35-millimeter ...

CMP Be nice to put it all together.

15 04 53 CMP ... Maybe I can take a couple ...

DMP ... here. ...

15 06 00 CMP Okay. Can I hold that till we ... - have to ...

DMP ... all we got.

CMP Is that it?

DMP Yeah.

CMP ... because that wasn't any problem.

15 06 10 DMP Well, just one little ... but that's ... I'll give you this bag ... That's ... Okay. ... stuff.

CMP I get real surprised how we fit this stuff --

DMP ...

CMP -- ... space ...

ACDR There's really no difference ... In fact, that's ...

CMP Okay.

DMP Okay. The ... angles ...

ACDR Yeah. ...

DMP Can have what?
ACDR ... about ... 

15 07 08 DMP Oh, okay. Okay. Then we got ... put them away.
ACDR That's all.
DMP That's it. ...
ACDR Yeah.
DMP ... the DAP.
ACDR Yeah.
DMP ...
ACDR I think we got her locked.
CMP All right.
DMP Yeah. We're okay.

15 07 26 ACDR We could really go ahead and tie down those ... Why don't you come on up - start this DAP - Yeah, why don't you come on up, Vance. Let's get --
DMP ... we already - we got this thing ... 
ACDR What we got to do now is ... attitude. Have to see if we're ready to come home.
CMP Okay.

15 07 51 ACDR ... must be 5-1/2 hours to retrofire ... 
CMP Yeah.
ACDR ... got an ASA in 6 to go on that?
CMP Yeah. ...
ACDR ... got to ...
CMP ... No, that's about right.
ACDR ... okay?
CMP Yeah.
DMP ... got the ...  
ACDR Yeah. I'll ...  
DMP ... big cloud pattern down there. 
ACDR Yeah. ...  
DMP ... around the ... Big cloud here, down to the left. 
ACDR . Down here on the left? 
DMP Yeah. You can see it to your left. 
ACDR Oh. 
CMP My left. 
ACDR Right. 
DMP See that ... around that island? ... Look, there's another big ... another ...  

15 08 47 ACDR Oh, hell! That's the Galapagos. That's what I'm supposed to be shooting! (Laughter) 
CMP ... 
MS ... 
CMP Look at that, down there. 
CMP Better with the wide angle. 
ACDR Oh, hell; look at those things. ...  

15 09 43 ACDR Okay. We've got the Galapagos Islands. Got stereos. ... clouds around ... the volcano ... through the cloud cover -- 

TIME SKIP
Okay, Crip. Thank you. We're progressing normally here, I think.

Very good. Somewhere during the next ATS pass ...

Here it is. B-6.

What?

B-6.

Yeah.

...

Yep. Has anybody seen the filter for the data pass, Tom? The orange filter? I don't have it.

The orange filter for the ... data pass?

Yeah.

Have you seen the orange filter for the ... data pass?

I haven't seen it.

Son of a bitch!

Is that the orange filter for ...?

Yeah. ... pass.

Oh, Vance has ...

Could be. Maybe I forgot, and I stowed it.

It's not there, Vance, so somebody has stowed it.

Maybe I did stow it. What the hell did I stow, that I thought I stowed that? (Laughter) The only thing that I can think of is ... What did I stow? I stowed something there this morning that I thought was ... Maybe that was it. Probably put it in 6. I stowed the ... I don't know where. I think in B-6. Okay; the ... in B-6. ...
Okay; thank you.

Okay; 11:33.

Okay; we've got 2, 3 ...

That's it, huh? All she wrote?

Yeah.

... filter?

Yeah, the filter is ...

... camera there. Silver camera ...

Well, we counted five on the other one.

Yeah. That's all - that's all we got left. You going to bag that too? ... filter.

Which do you want me to do?

... Try another one.

Yeah.

... get them all out here and get some ...

... Okay; let's put this filter over here. Okay; let's get them in order.

Let me get to the filter bag.

I'm going to get the orange filter for that lens. I've got the wrong filter. Let me get the right one. Wrong lens ...

Here's the ...

Thank you.

All right.

... That's it. That's it in the ...

Is that the box?
It's inside one of these other boxes. ... on the side of the box.

...?

Hey, I know what happened to that lens. I - I put the filter down here in that bag with the - the lens too. And I put a filter - put it down in the bungee bag, and when the lens that came with it ... somebody else in A-6. That where .. put it. Some­body saw it and put it back up here. That's what happened. (Laughter)

... bag?

I don't have any idea. All I remember is ...

Yeah. ... A-6. ...

Any time you're ready, ...

Yeah. We got to get the ILH - LiOH.

... 

Now, that - other bag. Still looking for it, I guess.

What bag?

And where will it be?

... up.

Okay.

... 

Yeah. ...

... 

Yup.

...
Okay. Stick tape on it, Tom. ... corner of A-6, there. Was anything taken out of A-6?

Okay, that ...

I'll go, Deke. Want to hand me --

Put it right in the front corner there.

...

...

Very good. ... I don't know ...

I don't know ... Well, ... get in position here ...

Okay.

Okay. ...

Okay.

...

We got 42 left on the Nikon, Tom.

Well - I don't know. Maybe ...

09 is black.

Okay. ... Okay, ...

Okay. All right. First, the top of the head, right?

Yeah, it helps.

Did you find it?

Okay. ... for the ...

... haven't tried ...

Yeah. Yeah, the bag is ...

Yeah. ... That's all.
Oh, did you? No, all I did was — I should have, I guess.

... tape recorder ...

Well, next one ... mapping pass.

Okay; coming up with ... revolutions 135 and 136. ...

Okay.

... orange filter ...

Yeah.

It could be that ...

Okay, Deke. Thank you.

... Hey, we've got an attitude in here now.

Yeah.

Where is it?

... Oh, I know what's going on. ... we go down from that. I'm looking at ...

... over.

... the Gulf.

Okay. ... ... water.

See those clouds there? They almost follow the coastline. That's why the clouds come out in front ...
... clouds line up on the ...

Apollo, Houston. We're AOS through MILA. I've got you for 6 minutes.

Okay.

And we just crossed good ole Boothbay again, and, as usual, it's under clouds here from our angle. Got some beautiful pictures, however, of the Cape Cod area.

Very good.

And we did get some color prints, or measurements, between the - New Orleans and Mobile there.

Great.

Get ... bit.

Good deal. We're all - we're all squared away now. One item, I guess, we need for - for entry - post-flight photos is verification that we did get our ZFF taken on time - that last one.

Verification of what?

Say again?

-- get the ZFF photos, our favorite fungi, taken back there at about - oh, 93:50 on the PET.

It was on time.

Okay, fine. Thank you.

As usual, Crip, as usual.

Oh, Roger. Didn't expect any difference. We're going over the hill; we'll see you at Newfoundland in about 7 minutes.
Okay. And I got the pyro battery check at Madrid. Thank you.

Roger.

Okay. ... Hey, Deke. The yellow ... K-cable [...] bag. Did we get rid of that?

He stuck it up in the docking module for a while. I think it's in the big cable bag, isn't it? K-cable 610?

Okay. Well, we were supposed to disable the DAC. Okay. Never mind. I was just wondering if --

But the cable came back.

Yeah. Okay. It's the bag I was wondering about. Okay. No sweat.

That was a good one.

... ... attitude ... off nominal ... ... to turn of the radiator ...

Well, we got stars to ... ... pyro batteries check coming up.

Always try to remember the Skylab Flight Plan is time loaded for individual ... pitch and roll ...

During entry, or what?

Well, no, I just ...

Oh. I think they - they got everything packed and ready to go before they ever undocked from Skylab.

Yeah.

They - ...

Okay. We've packed.

Okay.
Little baby, where are you?

Huh? Yeah. ...

Is there a box of Kleenex still around up there someplace?

Yeah.

...

What? ...

When you were talking about putting on the ... tape ...

Yeah.

I just - I did not ... I don't know - maybe it was ...

No.

Got your ...?

There are a lot of them in that ...

Oh, here they are. Just came flying by.

This rubber cushion. Got it in backwards here.

Yeah. ...

Okay.

Apollo, Houston. We're AOS Newfoundland, and with the ATS, we should have you about 50 minutes.

Roger. Okay. ...

Oh. How about a VERB 30?

I ... got it right here.

Oh. Oh, I see. You want it put in. Okay.

Minus 25 and yaw 4.
Okay.

Okay. ... ... see, yaw 4.

Pitch 5, yaw ...

How do you read on that, ...?

They don't ...

No. It's time to lock up.

Hello, Houston, Apollo. How do you read? Flight Plan says ...

All right. ...

TIME SKIP

Houston's ... right down the ...

... we're going to have --

MARK.

-- have Orroral in about 3 minutes --

You look out, and you'll see a retrofire pattern right now. Vance? You look out and you'll see a retrofire pattern right now. Is it on?

Yeah. ...?

One ... and one ...

Okay.

That's right, if you have a down time of --

Yeah.

I suppose you can take this ... book ...

Put it - I'll get it squared away later on.

Okay.
The only thing left is --

Is this yours, Deke?

I don't know. Hell, I don't know; we'll get it later. No, I've got one, that's yours, Deke.

Okay, ready for the EMS check.

We'll dress and we'll get our boots on later.

... down in good shape?

Well, I guess we might as well have ... out.

All right. We'll do it.

... Okay.

Okay. EMS FUNCTION, OFF.

OFF.

Circuit breakers, two, EMS, CLOSE; panel 8.

CLOSED.

EMS moni - MODE, STANDBY.

STANDBY.

EMS FUNCTION, EMS TEST 1; wait 5 seconds.

Okay.

Okay. Okay, EMS MODE, NORMAL; wait 10 seconds.

Okay.

Got it?

Yeah.

Okay. Slew hairline over notch in self-test pattern.

Okay.
EMS TEST 2. .05 G light on, all others out.
Okay. Verified.
Okay. Wait 10 seconds.
EMS FUNCTION, EMS 3.
Okay, I'm in mode 3.
.05 G light on; RSI light lower on, 10 seconds later. Stand by to PRO -
MARK it. Okay. RSI lower light on, 10 seconds later.
MARK.
Okay. Okay, is the RSI light on? Okay, then set range counter to 58.0.
Plus or minus ..., okay? EMS FUNCTION, TEST 4.
Okay. Go ahead.
.05 G light on; G-V trace's in the lower right-hand corner. Range counts down.
Counts down.
Apollo, Houston. We're with you on VHF through Orroral.
Roger. Understand.
Rog. Don't anticipate too good a comm this time, and we'll have you at Vanguard in about 3 minutes.
Okay.
Okay.
Okay. ...
...
RSI upper light on, 10 seconds later.
Okay, and it's supposed to come to 9 g's, right?
 That's right.

MARK. Okay.

RSI upper light on, 10 seconds later, and I've got ... on. Got it? Range indicator 0.0. Scribe traces vertical line 9 g ... 0.28 plus or minus --

Wait.

Got it?

Okay.

Set EMS scroll to 37K.

Stand by for just a second. Houston, Apollo.

Go ahead, Vance.

EMS checks out good for entry.

Very good.

Except we haven't checked it for burn ...

Okay. And what is it, 38?

TIME SKIP

Why don't you give me the equipment checks?

...

Well, we got a - you're going to have to - you've got 9 or 10 minutes to retrofire, so you'd probably better - start that. What you got next on it?

Not much, but you're going to - I'll read you something down the line.

All right. Let's see --

...

Huh?

618
19 29 27 DMP ...?
19 29 28 ACDR Yeah.
19 29 29 CMP Yeah.
19 29 30 ACDR Yeah.
19 29 32 CMP One more.
19 29 44 DMP ...
19 29 45 ACDR ... want a - projectile up there. Now. Here it is. Yeah.
19 30 20 ACDR Vance, you want to - you ready for your stuff, your heel things?
19 30 23 CMP Yeah.
19 30 24 ACDR I'll put - I'll put them on for you while you're getting that other checklist.
19 30 28 CMP Okay. Let me just check again. I'd like to check them over.
19 31 01 CMP Okay. Your DAC's all set up.
19 31 02 ACDR ... turn on the cabin fan.
19 31 06 DMP It's on.
19 31 18 ACDR Let's get this mother as soon as possible.
19 31 28 CMP Okay. Final stowage list. Have you got ORDEAL?
19 31 31 ACDR That's stowed, locked away, and turned off; and both balls are INERTIAL.
19 31 34 CMP Now's when I have to get down - GLYCOL TO RAD SEC valve, BYPASS. On panel 377. Yeah.
19 31 51 ACDR It's stowed right - it's stowed right there on the - down by the ...
19 31 54 CMP Okay.
Okay.

Verified except for one that I have to go.

It's very quiet - been 20 minutes.

Okay. R - CM RCS HEATERS are OFF. CM RCS LOGIC is OFF. CM RCS HEATERS, secured. RCS activation in 20 minutes.

Do you know what we forgot to do?

What?

Sign the Goddard book.

(Laughing) We'd better do that, huh?

Yeah, there's something in the middle of the Flight Plan ...

Okay. Get that bag and tie that down.

...? ...

Boy, that's a really a nominal entry. When they gave us that last burn, they really - gave us a good - good burn.

Yep. You got a ballpoint, Deke? It's right on the left. I guess just the title page will do, huh? ... these --

Hell, I've signed it, haven't I?

-- we've all signed it but you.

How're you doing?

Good.

Let me look around in this hatch and make sure we don't have something floating loose. Toothpaste!

The tunnel is clear. Yeah, I may or might -- may not get my teeth brushed. (Laughing)
Might be on TV.
I know I'm not, because I lost my toothbrush. ... decision.
Okay. I'm going to reel the tape recorder back in here.
That should be a good spot, Tom.
Did you take the tape out of that thing? We didn't.
No.
Well --
No, no.
We'll get it. Okay, this God damn gift bag is pretty much floating but I don't guess it'll --
... -- hurt anything.
Maybe I can take it and stick it under the - the ...
Well, the problem is to get down your little strut, as a matter of fact.
Yeah.
Hold on to this, and I'll do it.
Here's another projectile. Got it.
... ...
... ...
... ...
... ...
Yeah, ... going to do with this box.
Where is our gift bag at? Oh, there she is ...
19 43 25 DMP ... 
19 43 26 ACDR Okay. Got any other ...?
19 43 32 DMP ... I'm going to shitcan this watch now.
19 44 07 ACDR Okay. 29:06.
19 44 11 CMP Yep. ... ...
19 44 35 ACDR Do you got ... on it yet?
19 44 54 CMP Okay, try it over here.
19 45 04 ACDR This is our entry pad? The preliminary - the final?
19 45 06 CMP Yeah.
19 45 07 ACDR Okay; we'll copy that stuff down on it. Did you check P- P30 this morning? P30?
19 45 19 CMP Too early. There's no point in doing it ... The next thing is activate the CM RCS.
19 45 48 ACDR You going to get us the updates, the final updates?
19 45 54 CMP Did that.
19 45 56 ACDR I mean as far as the STDN update?
19 45 58 CMP Yeah. Yeah, they'll update.
19 46 08 CMP They've got a chance to change their mind on that final pad Crip read up, Crip said.
19 46 37 DMP Listen.
19 46 38 ACDR Yeah, sure, Deke.
19 46 45 DMP Okay, coming up the California coastline here.
19 46 49 CMP One more rev. Okay, what part of California?
19 46 54 DMP Don't know. I'm not sure.
19 46 58 CMP San - what do you call it - Valley.
Stick it in the bottom.

Throw it away. Anybody else want some?

No, thanks.

That goes for the toothbrush, too.

Oh, there's the Salton Sea down there. We're right up above San Francisco, must be.

Yeah. San Joaquin, that's what --

Yeah.

Apollo, Houston. We're AOS Goldstone – 4 minutes.

Roger, Crip. Coming right up over the San Joaquin Valley. Loud and clear.

Simulator.

Yep.

RET 0.2 g, 27:51.

Down range error, minus 444.7.

We don't have the cross range yet.

Good.

The basic bank angle is 307/051.

Our splashdown point, I thought, would be 200 west of Oahu. Now it's 400.

307/051. RET reverse bank is 33:42. RET DROG, 36:27. RET MAIN is 37:14. Okay, it's all written down in big letters.

Okay, thanks.

Got that? Okay, we – did you set the angles, Deke, for the satellite?
19 52 49  DMP      Yeah.
19 52 51  ACDR     They're in there.
19 52 57  CMP      Got about 10 minutes here - 5 - do anything - Make a last phone call.
19 53 03  ACDR     Myrtle call? That's a good idea. ...?
19 53 12  CMP      Yeah. ...
19 53 18  ACDR     I guess we turn Myrtle off, don't we?
19 53 20  CMP      Yeah.
19 53 22  DMP      ... tricky. I left it vent in there.
19 53 24  CMP      Waste stowage vent, might as well close that, too. Make sure it's closed. It is now.
19 54 37  ACDR     Let me use it as soon as you're finished with it, Vance.
19 54 39  CMP      Okay.
19 54 40  ACDR     Got to ... around here for one last go.
19 54 42  CMP      You got it.
19 54 47  ACDR     Final check around. Vance, I think I'm around your -
19 55 00  CMP      Sorry about that. You have to come down, no, go over it. ... 
19 55 06  ACDR     ...
19 55 21  ACDR     You want to use Myrtle one last time, Deke?
19 55 23  DMP      Might as well, whenever you're through. Then I'll flush it.
19 55 26  ACDR     Okay, and then - Oh, we don't need to flush it, we just --
19 55 29  DMP      Well, ... --
19 55 30  ACDR     -- just turn the - the - the dump off. You know, ... off.
Okay, all we got to do is this - battery's in VENT. Let's repeat: all we got to do is - Deke, after you use it, is go to --

Go to VENT.

-- to VENT.

Let's see, on --

I'll get it.

-- I wonder if we're supposed to have - I guess it doesn't much matter if we have the battery vent when we land - never thought about it.

Well, we could shut the battery vent, too - shut both the ...

Yeah. Why not.

-- ... screw up the telescope. ...

Expect we do.

Okay, we're in position, we want to shoot six frames here, right?

Yeah, that'll - that'll give - six frames will get you a pretty damn good picture. ...

That'll do her.

Going to have to probably kind of keep an eye on her, huh?

Yeah. No, here's what I'll do. Whenever I see anything that looks like it ... is turn it off. And then I'll wait until late in the game to ...

Yep.

Okay, I'm going to read over some of these rules here, Tom.
All right, let's do it.

Take over during the burn. 5 degrees - 5 degrees a second. Cutoff burn time, plus 1 second. If you don't make the time, we burn 90 seconds late or 11 feet per second underburn.

Don't...

...overburn and still make the target. Down range error check should be valid - if trim residuals are greater than 0.2...

It's 40 minutes.

Okay, this is what we should have had them change.

Okay. Tom, let me show you this completion chart.

All right.

It says - 191.

Okay.

RCS capability.

All right.

Let's check it. If no ignition - ignition or T-to-go is greater than 169, go around.

Yeah.

-- if less than --

169, complete.

-- complete. Here's the line. In other words, if it's on this side, we go around, on this side, we -

Here?

Yeah. Back here.

TIME SKIP

626
20 32 02 ACDR  - - 0.2 in pitch, 8 in yaw.
20 32 04 CMP   Okay.
20 32 05 ACDR  Check the MTVC.
20 32 07 CMP   Okay, clockwise?
20 32 08 ACDR  Clockwise, no MTVC. PITCH 2 on and YAW 2 on.
20 32 14 CMP   PITCH 2 on -
20 32 15 CMP   MARK.
20 32 16 ACDR  That's good.
20 32 18 CMP   YAW 2 on -
20 32 19 CMP   MARK.
20 32 20 ACDR  Set trim.
20 32 21 DMP   ... predictable.
20 32 22 CMP   Good.
20 32 24 ACDR  SPACECRAFT CONTROL, CMC. Check MTVC, we got it. Neutral. No MTVC.
20 32 33 CMP   No MTVC.
20 32 34 ACDR  GPI returns to zero.
20 32 36 CMP   Rog. Go ahead. AC/DC?
20 32 41 ACDR  Hold it. Well - Well, wait. Oh, I'm sorry. Okay, you're - you're way ahead of me; that's good. Okay.
20 32 45 CMP   I'm sorry.
20 32 46 ACDR  No problem. Okay, AC/DC. You got BMAGs, three to RATE 2.
20 32 50 CMP   Rog.

627
Okay, you ready?

Trim.

PRO. That put the ERROR light on.

Get that circuit off ...

Right there, where you're pointing it; 204.

ATT 1, RATE 2.

Sounds good.

... there. Okay. Let her - let her rip.

Proceed. ... checking around back there.

Okay, it looks good.

Yep. Yep. Did you -

RATE HIGH - ARMED.

RATE HIGH.

EMS is DELTA-V - DET ... seconds.

I only got a 35 on the 5 mark over here, Vance. I got 15 on the other one.

15 at minus 2 minutes.

Oh, okay. 4 minutes to go on that.

SPS N₂ and He.

Okay. Stand by to ... 14, 15, 16 ...

Yeah.

We pitch down after this ...

Okay. 7 seconds - the secondary comes on at what, 2 seconds?
About 3. Just long enough so you can see them separate, yet not so long that you interrupt the program because of your ... temperature. Okay, we're down to 18 degrees. Coming right in there.

Apollo, Houston. We're all GO here for your deorbit burn.

Okay, Crip. Very good. So are we.

Standing by for 59, huh?

Yep.

This will be different - doing SPS burn strapped in this way.

(Chuckling)

I've never done that before.

It will be a longer jolt.

Yeah.

...

Pardon me.

I said, we'll take ...

Yeah, they're on.

However, ... you need to remember where - ... pitch and yaw ... 

Okay; 59.

NORMAL.

NORMAL and THC POWER on.

POWER on.

Okay. Do you have on - A/C ROLL on, too?

Not now.
No.

We've got four-jet ullage.

We've got no requirement for A/C, since our roll jets are B/D.

Yep. We'll get them after the trim.

... Oll.

Okay. Minus 25, DSKY lights.

... B.

Bank A, ARMED.

She's ARMED.

Okay.

... 15 ...

Ullage. Delta-V's counting down. Both banks are looking good.

Okay, you'll count her down to ...?

10, 9, 8, 7, 6, 5, flashing 99, 4 --

PRO.

-- PROCEED, 2, 1 --

BURN, baby.

Okay, you got BANK A -- BANK B --

Count her, and that's 6, 7 ... -- Beautiful!

... is right on the nose.

Okay. Proceed.

Okay. Let's trim it. Overburned a tad.

You did? Okay, pull her back. A/C ROLL on, ... --
As a matter of fact, I wondered if I didn't cut it off -
I tried to give you a little lead time there on that - ... seconds.
Right. (Laughter)
A/C ROLL.
That's quite a buck you get, isn't it?
Yeah, I agree with that.
Yeah.
... trash. Using all the time - these God damn bread crumbs floating around.
(Laughter)
Yeah, he needs a cherry nutcake.
Okay -
Okay, a little minus - -
A little minus and to the right. ... off. No, I don't either ...
Kind of wish one of you guys could ...
You've got four jet.
Okay.
Okay, 0, minus - minus 1, there we are - plus 2 - -
0, 1 - -
And 0. PROCEED.
Okay. PRO. Okay, go through the rest of the cue card ...
All locked up.

Okay, 0,0, VERB 82 ENTER.

Copied that.

Okay, GIMBAL MOTORS coming off.

Looks like a real nice little perigee.

... -

MARK. YAW 1 -

MARK.

That looks good.

PITCH 2 -

MARK. YAW 2 -

MARK.

Okay, they're off.

TVC SERVO POWER's --

Good.

Minus 18.4, Tom.

Okay.

Okay, now we stay right here --

Minus 18. On the EMS.

Yeah.

Okay, record the burn status.

Okay, and we stay with that ...
Yep. We sure do; all the way. Okay. VERB 66 ENTER.
CM RCS check.

Okay. Did you get the VERB 66 --

I already got the VERB 66 ENTER.

Okay. Okay, go ahead.

CM RCS check. AUTO RCS A/C ROLL, four, OFF.

OFF.

Circuit breaker, RCS LOGIC, two, CLOSED.

CLOSED.

SPACECRAFT CONTROL. SCS, MIN IMPULSE.

Okay.

RATE 2, SCS.

SGS.

MIN IMPULSE.

MIN IMPULSE.

Okay. RS - CONTROL to CM - TRANSFER to CM. Okay. CM.

Okay.

Okay, AUTO RCS, 1, OFF. We'll hear these little rascals fine.

... --

Test ring 2.

-- ...

Oh!

...
Don't hear anything. Go ahead, test ring 2. You got any firing?

Yeah, I can hear it. Hear that?

I can hear solenoids. I'm not sure I hear --

Yeah, I - I can see --

Give it some roll.

I can see the rates.

Yeah.

That's all right.

Okay.

Yeah, I can hear something going - bumpety-bump.

Okay. Ring 1, ON; ring 2, OFF.

... Okay. Now watch this. I can see the flashing of the lights.

Okay. Good show.

Okay.

Okay. AUTO RCS ring 2, MNB. Okay, RCS TRANSFER, SERVICE MODULE. Okay, check that you got good thrust, using SCS. What was that? Should be MIN IMPULSE. Just check that you got SERVICE MODULE. Okay, you got it?

Yeah.

Okay. Okay. BMAG MODE, three, ATT 1/RATE 2.

ATT 1/RATE 2.

Okay. RATE COMMAND. You got all three RATE COMMAND?

RATE COMMAND.

All right, you're in good shape. Okay. Ready to go?
Yeah.

SM [sic]/service module SM sep checklist. PRIM - MAIN BUS TIES on, verify; they’re on. LIM - PRIMARY GLYCOL TO RADIATOR, BYPASS, pull.

Pull.

GLYCOL TEMP IN, MANUAL. GLYCOL EVAP TEMP IN, MANUAL.

TEMP IN.

Okay. That’s all right, you don’t do it.

You don’t?

Because that’s a primary loop. Circuit breakers, four, PITCH and YAW, OPEN.

You mean the SPS?

SPS.

OPEN.

Got those OPEN. Circuit breakers, ELS/SM SEP, two, CLOSED. Bottom row.

Two CLOSED.

Okay. VHF AM A and B, off, center.

Okay, A’s off - B’s off.

Okay, Crip, we’re GO for your shutdown on the ATS. Over.

And you’re GO to go ahead and do that, and we’ll have you in about 7 minutes at ARIA - correction, Orroral.

Sounds good.

See you later.

(To meet you soon on Earth.)

ATS-F POWER AMPLIFIER, off.
Good.

ATS-F TRANSPONDER, off, and HIGH GAIN POWER, OFF.
All three off; good. RHC POWER DIRECT 2, MNA and B.

Okay. DIRECT, MAIN A/MAIN B.

COMMAND MODULE RCS LOGIC, on and up.

CM RCS LOGIC; on, up.

STDN for contact, we don't have them. Just lost them. We're under the ATS. PYRO ARM.

Okay. PYRO ARM.

Okay. Verify correct sep attitude. Okay, let me call this.

We're there.

VERB 37 ENTER. 62 ENTER. Let's get average g up. Okay.

Okay, it says sep this - the command module. We got average g on. You ready to go? Okay, CSM/DM sep; here we go.

Yeah.

Ready?

Okay. Let her rip.

You check everything?

Yep.

Okay - here we go.

... 16 W.

[SEPARATION]

Okay.

Pow. (Laugh)
Watch - Yawing back?
Okay, we got control.
Okay, we got control. Whoof!
Okay. You got bus voltage, batteries all look good.
Gee, this ... spreads the dust.
Yeah, then you go MANUAL ATTITUDE, three, MIN IMPULSE.
MIN IMPULSE.
RHC DIRECT 2, OFF.
DIRECT 2, OFF.
BMAG MODE, three, to RATE 2.
Okay. BMAG, three to --
CAUTION AND WARNING to COMMAND MODULE, which Deke has already got.
Got that.
CM RCS manifold pressure check, 1 and 2. 2 is norm, we'll stay there. Looks beautiful. SECS --
... seeing the firing out your window, Deke.
SECS PYRO ARM, two, SAFE.
Do what, Vance?
Two, SAFE. Look out ... --
AUTO RCS SELECT, 12, MNA/B; you've already done that.
Yeah.
You mean the thrusters?
Yeah.
Oh, yeah --
CM RCS LOGIC, OFF.

Okay. We got the CSM sep. Monitor delta-V ... --

You need a little more light here so you can see what you're doing.

Okay, voltage is good, Deke?

Yeah, bus voltages are good.

Okay. Now let's recheck that.

Batteries are good, pyro batteries are --

Plus 22.0, minus 160. Okay. VERB 23 ENTER for the lift vector up.

There's something weird going on on this one --

Okay. You add minus 1 for lift vector down, minus --

What?

Lift vector up, yeah. That's right.

Minus 1. Now recheck just for sure.

What'd you say, Deke?

Plus 022.00 --

Go ahead, Tom.

-- minus 163.00, and minus 1. Lift vector is up.

Yeah, but -- Deke, what did you say?

I said we're getting an oscillation on the frigging amperage. There shouldn't be any on the pyro bats. I don't understand that.

What have you got for voltage?

My voltage up there is 37, but we're just getting a -

But you don't read out amps on the pyro volts.
<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 46 03</td>
<td>DMP</td>
<td>Well -</td>
</tr>
<tr>
<td>20 46 04</td>
<td>ACDR</td>
<td>Do you?</td>
</tr>
<tr>
<td>20 46 05</td>
<td>DMP</td>
<td>Not unless you're drawing power on them. That's what's worrying me about them.</td>
</tr>
<tr>
<td>20 46 07</td>
<td>ACDR</td>
<td>Okay, why don't you just monitor the pyro?</td>
</tr>
<tr>
<td>20 46 10</td>
<td>DMP</td>
<td>Well, everything else is looking okay, so -</td>
</tr>
<tr>
<td>20 46 12</td>
<td>CMP</td>
<td>Okay. We don't have the pyros tied. Is it on both of them?</td>
</tr>
<tr>
<td>20 46 16</td>
<td>DMP</td>
<td>Yeah. Just sitting there bouncing. It may be an instrumentation problem.</td>
</tr>
<tr>
<td>20 46 20</td>
<td>CMP</td>
<td>Okay. Just one thing to remember. We can always cut into the entry batteries for py - pyro power - -</td>
</tr>
<tr>
<td>20 46 24</td>
<td>DMP</td>
<td>Yeah, that's right. Yeah.</td>
</tr>
<tr>
<td>20 46 25</td>
<td>CMP</td>
<td>-- if we ever have to. It's down to 50.</td>
</tr>
<tr>
<td>20 46 27</td>
<td>ACDR</td>
<td>Okay. We go a PROCEED. Again to recheck that finally.</td>
</tr>
<tr>
<td>20 46 30</td>
<td>DMP</td>
<td>I'm going to ... one thing.</td>
</tr>
<tr>
<td>20 46 31</td>
<td>ACDR</td>
<td>Plus 22.0, 16, minus 1, ... PROCEED. All right?</td>
</tr>
<tr>
<td>20 46 35</td>
<td>CMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>20 46 37</td>
<td>ACDR</td>
<td>Okay. STDN for final target pad, EMS initialization, and pitch to pad .05g. Start your pitch. Got her?</td>
</tr>
<tr>
<td>20 46 49</td>
<td>CMP</td>
<td>Okay, and -- --</td>
</tr>
<tr>
<td>20 46 50</td>
<td>ACDR</td>
<td>You can take this down; we don't need this bear any longer.</td>
</tr>
<tr>
<td>20 46 53</td>
<td>CMP</td>
<td>Yeah. Let's see. Up to 5. Okay, give me initiation stuff.</td>
</tr>
<tr>
<td>20 47 04</td>
<td>ACDR</td>
<td>Okay, EMS initialization. EMS FUNCTION, TEST 5.</td>
</tr>
<tr>
<td>20 47 10</td>
<td>CMP</td>
<td>5.</td>
</tr>
<tr>
<td>20 47 11</td>
<td>ACDR</td>
<td>Verify scroll, 37K.</td>
</tr>
</tbody>
</table>
Verified.

EMS FUNCTION, RANGE SET.

RANGE SET. Plus range.

Okay. Set range to pad range-to-go. Pad range-to-go: 1637.1.

It's at 1637.1.

Yep. Okay, 1637.1.

Okay.

EMS to Vo SET; Vo SET is 25752. And we got at least 15 minutes before .05 G. We're in Fat City.

Yeah.

I just checked the mal procedures, and they don't even have anything for pyro bat failure for entry, but --

Might go back and check - check the voltage.

-- ... the switch. No, the voltage is great, there's no problem with voltage. You're right. There shouldn't be any amperage reading on the damn things, but it's just that they're oscillating.

Okay, 25572; right?

25752.

Okay.

All right?

Got it.

EMS MODE to STANDBY.

Okay. STANDBY. Verified.

Verified. EMS FUNCTION, ENTRY.

ENTRY.
Verify .05 G filter light is down.
Down ...
Which it is. All right. Go to entry page E/2-1. Let's do that. Fucking bunch of shit.
True.
Well, there's the old Earth.
Got her out there, huh?
Yeah.
I'm glad to know it's still there.
(Laughter) We're coming down to —
Yeah. Would you believe we're going retrograde with heads down, which got to be lift vector up?
How about that.
Oh, boy.
All righty.
Right.
Well, I hate to come down; been a nice son of a bitch!
(Laughter) Yeah. God damn, it's been a lot of fun, hasn't it?
It's been a ball.
It sure has.
It's been 9 —
Really enjoyed it.
-- great days. Couldn't have been better, you know. I think we did about everything that was required.
Hey, and there's the old Southern Cross, I do believe.
Good.
It's sitting right out the window.
Oh, yeah. That's a beauty, isn't it, Deke?
Yeah.
You don't get to see that very often.
Not very often.
In fact, I haven't seen any stars at all this flight. Seems like we're in the cockpit all the nighttime, and -
Yeah.
That's right. We haven't looked at them very often. And those stars should be moving from right to left.
We got some sparklers out there.
Yeah, a lot of sparklers.
They must be off the thrusters.
Those are off the thrusters. They're ablative thrusters, yeah, they ... that stuff.
Yeah.
Look at them! Look at them!
Isn't that something?
Uh-huh. (Laughter)
I don't remember those before.
Hey, it's coming out - that's because --
Oh, that's the Sun.
-- the Sun's coming up.
We're in the frigging Sun --

God! Isn't that something!

God dam. I wonder - Shit!

Think I'll try it!

Try it.

Try it.

(Laughter)

Full open. Go to f/2 and --

f/2, wide open. We'll see what happens.

Yeah, I bet you'll get something.

We've got nothing to lose. And go to about f/2, about half a second; put it in --

Yeah, give it --

-- wide open.

-- fast enough so they won't be all streamers.

Yeah.

Yeah.

Okay, well, I'll just ... a couple when the - if I could do it when the fucking thrusters aren't firing.

(Laughter)

Shit! I moved it too fast. Sometimes you can't really tell it from stars.

Just tell - just tell Vance to open thrust.

Yeah. Tell me when to thrust, I'll give you a flashbulb.
Okay, well - but I don't want that much light --

I know it. (Laughter)

I don't know, it might - Ah, I bet that one did.

(Laughter) Sorry.

That son of a bitch!

(Laughter) Well, maybe you'll get the flash.

Hey, that's - that's beautiful.

I won't thrust this time. It's instinctive to thrust when I have to.

Well, let me play - Oh, hell, yeah; go ahead. I'm going to play a Ralph Morris here, and try some different settings since we got so much film. Maybe something will work.

Okay. Good burn, good sep, and we're coasting down to .05g. How do you read, Crip?

Hello, Houston; Apollo. How do you read?

And, Apollo, be advised that we have ...

Okay, that's good.

How are you reading us, Crip?

Loud and clear, how me?

Okay. You guys got data down there now?

That's affirm. We've got ... Orroral.

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

Hey, look at behind you, Tom.

Yeah.
20 52 06 CMP That's the Sun coming up.
20 52 07 ACDR Yeah, isn't that beautiful? Fantastic. You're about there. Coming up .05g; pitch .05g.
20 52 15 CMP Yeah, I guess I better get some lights - on top of this ... Go ahead.
20 52 18 ACDR Yeah, we got plenty of time.
20 52 21 DMP 20 - Yeah, we still got 12 minutes, haven't we?
20 52 23 CMP Yeah.
20 52 25 ACDR Yeah. Well, leave them down. It'll be sunlight in a couple of minutes.
20 52 29 CMP Get those sparklers while you can.
20 52 31 DMP Yeah. Yeah, let me try a couple more here.
20 52 34 ACDR Look how they're turning red right up here in the top.
20 52 36 CMP Some of them are, yeah. Must be that - just the propellant, huh?
20 52 46 DMP Well, it'll be interesting to see if I can get that or not.
20 52 53 CMP Yeah.
20 52 55 CC-H ...
20 52 59 DMP That's affirm - pyro. And they should nominally be reading zero, and they're just oscillating there, and I'm assuming that's that instrumentation thing, but -
20 53 09 CC-H That - that's affirmative. ...
20 53 13 DMP Okay.
20 53 15 CC-H Okay, we're about to go ... here at Orroral, ... blackout through ARIA.
20 53 22 DMP Roger.
46 degrees, right? And I'll trade with you.

Yeah, okay. B.

Well, now let's see here. Maybe I'll shoot some of that mag anyway. Well, I think I'll try to get some stills of entry if it looks like we're seeing anything.

It's going to be pretty --

Pretty bright.

Yeah, so you better set it up to about --

Probably 1000.

-- Well, 500 is good.

Good.

I'd say shoot it about f/16 --

I'll see what the --

-- 16.

-- light meter might give us a good reading on it.

16, 8, 22.

... Okay.

Okay. Vance, don't have much to do.

Okay, verify the MAIN BUS TIES are still on --

Okay.

-- and we wouldn't have power if they weren't.

It's 46 degrees and you're right there.

Both bus voltages are up - A is 28.2, B is about the same.

GDC's right on the IMU. Ring 1 and ring 2 looks like we've hardly used any propellant.
I'd like to see for a minute if the DAP controls like - it does in the simulator.

Oops! Watch it.

54. What was that? Guess it ... Go back to work in there.

(Chuckling) It does.

It takes - yeah.

That son of a bitch.

It takes you right back.

Yeah.

That's just logic to take you right back to track.

Yeah. That son of a bitch really goes.

... knows yet that that's a - -

A lot more - yeah, it's a lot more crisp than in the CMS, I'll say that.

Pulling a lot more amperage than I thought we would. ...

Okay. Okay, the time of .05g just to recheck --

26:25.

26:25. And at 5 minutes, minus .05g, you can go to 5 and 5; hell, that's your choice; do what you want to. I'd stay right there and keep those rates going.

What time have you got?

I'll give you time on that. That would be 21:25.

Okay. Let's see if - right in here, you want to check the IMU versus the GDC, too, don't you?
20 56 04 ACDR 2 minutes, so we got to - Ooh, 23 - we got 5 minutes to go until that. It's looking damn good. GDC is off a little bit in yaw, not much. What do you got - what do you read for pitch?

20 56 19 CMP What do I need - read?

20 56 20 ACDR What do you read?

20 56 21 CMP About 46.

20 56 24 ACDR Yeah, I'm reading 47-1/2. Roll's right on. Yaw is maybe 1 degree left. That's probably from hysteresis, I mean left parallax.

20 56 47 ACDR Here's your horizon coming in, and we're going --

20 56 49 CMP The sky's getting just a teeny bit blue, not much.

20 56 53 DMP (Yawn)

20 56 54 ACDR No, you don't get much yet.

20 56 56 DMP No, we're still up there pretty high.

20 57 02 DMP If you guys see anything out your windows you want to shoot, why I'll pass you the camera; I'm just sitting here. Well, I'll see what kind --

20 57 08 CMP Well -

20 57 09 DMP -- of light reading - reading I get out there.

20 57 11 CMP Man, are we moving. (Laughter)

20 57 13 ACDR Yeah, you can - as we drop lower, you can see we're going to be moving like a son of a gun there.

20 57 18 DMP Like a scalded-ass ape, huh?

20 57 20 ACDR Okay, the initial bank angle -

20 57 25 DMP I think I'm going to shoot a reentry photo here or so --

20 57 28 CMP Hey, get one or two out the side there.
That's what I'm doing, just holding her out the window there where I can't see --

Beautiful!

-- and shoot them a couple. So I think we got a nice angle on it. Looks to me like we're -- we're still pretty flat, I guess.

Yeah, it -- it drops in pretty steep at the last.

(Humming) Okay, 20 minutes.

Oops!

26:25 is .05g.

There's a big old ... out there. (Laughter) Look at that fucker.

Okay. Okay, minus 2 minutes would be -- 23 plus 25.

5 minutes yet before we ... Man, it sure rides smooth, doesn't it?

We're yawing down a little bit and pitching. We're starting to pick up some atmosphere.

Yeah.

That's why I like to stay 5 and 1 longer than what they call for in the checklist. You want me to fly it for you where you can --

It almost --

Nah, it'll be okay.

-- feels like you can feel this son of a bitch accelerating.

You can look down and you see we're getting low -- look at that cloud go by, Vance.

Yeah.

Okay.
Okay. 21:25, .05g minus 5 minutes. FDAI SCALE 5 and 5. I'd - I'd say that's your option.

Yeah, a little more. Doesn't like that trim, does it?

Getting some aero. Oh, look at that stuff go by.

Now you know you're moving. (Laughter)

Jesus, we're really hauling the fucking mail.

(Laughter)

Of course, we've been doing this right along.

We're just closer, we don't --

We're just getting a hell of a lot closer. You're getting it - we'll soon be about half as close as we were.

Yeah.

Okay, you squared away?

Yeah, just about.

It sure would be nice to have a movie camera to shoot out that window to pick that up.

Okay. At 23 plus 25, it's .05g minus -

Okay, we still got about 800 in the PS - in the surge tank.

Okay, in good shape.

Our rings are beautiful.

Lost comm.

Huh? You lost comm?

That's okay.

We can hear you.
21 00 40  ACDR  We can hear you.
21 00 41  CMP  ... hear ...
21 00 42  ACDR  Did you get that closed?
21 00 43  DMP  Well, I can - I can hear you talking. I don't - but not on intercom.
21 00 48  ACDR  That's okay, Vance.
21 00 49  CMP  ...
21 00 53  DMP  You can hear us so -
21 00 55  ACDR  Well, he can hear me, Deke.
21 00 56  DMP  Yeah.
21 00 57  ACDR  Why don't we get our m ú - mikes up close? Get your m ike up - -
21 00 59  DMP  No, he's lost his intercom there somewhere, but what the hell, he's talking.
21 01 02  CMP  Yeah, I can hear you talking.
21 01 04  ACDR  You can hear me.
21 01 05  DMP  Okay.
21 01 07  ACDR  All right, Vance.
21 01 08  CMP  You can hear me?
21 01 09  ACDR  Yeah. No.
21 01 10  DMP  No, we can hear you but not through the comm. It doesn't matter, we can hear you.
21 01 15  ACDR  Okay, why don't we just strap - tighten these things - tighten these straps down a little bit.
21 01 22  DMP  Yeah, I cinched mine there before we ever started.
21 01 26  ACDR  Really pop them in now.
21 01 45  ACDR  Back with us?

651
21 01 46  CMP  Yeah.
21 01 48  ACDR  Rotate it towards you.
21 01 49  DMP  What happened?
21 01 50  CMP  The darn thing must not have been locked, it came off.
21 01 52  DMP  Yeah.
21 01 56  CMP/ACDR  Okay.
21 01 57  DMP  We can hear you talking.
21 01 58  ACDR  24:10.
21 02 01  DMP  By golly, I think I'm beginning to pick up a little color out this window.
21 02 04  ACDR  I don't know, the sky's still pretty --
21 02 05  DMP  Oh, yeah! Shit, man, we're --
21 02 07  ACDR  Look at the - Hey, turn on your camera, Deke.
21 02 09  CMP  Hey, yeah; it's getting red.
21 02 10  ACDR  That's the fireball. Get her going.
21 02 12  DMP  I got it running.
21 02 13  ACDR  Okay, a hundredth of a g. Okay.
21 02 18  DMP  Okay, wait a minute. You want it on 6? I didn't have it on 6.
21 02 20  ACDR  Yeah. I'll be watching how much we're using. Okay, now there's the fireball --
21 02 27  DMP  Okay, let's save some for the --
21 02 28  ACDR  -- like a big copper cloud.
21 02 29  DMP  Yeah, that's what it looks like.
21 02 30  ACDR  Okay.
21 02 31  ACDR  We got lift up --
Now, see if there is any way to --
-- you'd better believe it.
Look at the sparklers coming off.
Okay, stand by at .05g for EMS MODE BACKUP/RANGING.
Right; 26:25.
26:25.
Shit!
GDC and IMU agree good.
We're in good shape. 26:25. There's 100.
Oh, man! Look at that out there.
Come on, baby. Dig in some more. Pick up a little more g's up there, baby.
She wants to go where she wants to go.
016, should we have --
Okay. Looks like we're going to have good agreement. ...
Should have more - should be a 16 64.
Okay, we got a minute until .05g.
Okay. Yeah, you're right.
Jesus Christ, we got a minute to go yet?
Yeah.
Yeah, that's --
That's where most of your fireball is; out there.
Boy, it's funny how that --
Yeah, but I'm worried about running out of film.
Okay, good. Deke, why don't you go back to this --

Let me go back to 2, because we started a minute and a half early there. Hell, there's now way that God damned film is going to last --

Yeah.

There's two-tenths of a - two-hundredths of a g.

Okay, it's 26 - we got 25 seconds.

Hmm.

Three-tenths.

Tell you, as soon as I see something --

There goes some shit flying by.

-- that looks different, Tom, I'll ... --

Four-tenths. Okay.

There you are.

Back to 3, back to 4. 26:25 - 18, 19, 20, 21, 22 - 3, 24, 25 -

It's running.

26. Okay. EMS ROLL, on. EMS ROLL.

EMS, on.

.05g.

.05g and we're waiting for - two-tenths.

That was about 26 - 26.

 Damn it.

Yeah, that's very good.

Beautiful agreement.

Tom! Look at it out the side there.
Okay, look at the Beta; Beta at 06 74. Now you're starting to feel something. .05g is on, and we're coming down good.

We're up to seven-tenths g; eight-tenths.

No, we're not. That's seven-hundredths - seven-tenths --

Seven-hundredths, I mean.

(Laughter)

I mean on the way to two-tenths.

Oh, shit.

Look at that up ahead.

Isn't that beautiful!

Or - behind rather.

That doesn't change enough though, Tom, I don't think, to matter whether you're shooting - 2 or 6.

Probably not.

Even though there's a --

There's a tenth of a g.

Not much difference between frames.

Oh, man -

Man, look at that!

Yeah, okay, let's - down range error check at two --

Now, got that - got her going on that one? Good. Okay, 11.

11.

Beautiful; God damn.

Isn't that something?
21 05 20  CMP  Beautiful.
21 05 21  ACDR  See that stuff flowing past?
21 05 24  CMP  Okay, get me in a VERB —
21 05 26  ACDR  Want to hit a VERB? Okay, 15. Next one occurs at 27:51. Just watch your correlation. 16-17. 18.
21 05 43  CMP  We're going to get there ahead of them.
21 05 44  DMP  Yeah, we —
21 05 45  ACDR  19.
21 05 47  DMP  -- get through .05g earlier.
21 05 51  ACDR  20. There it is — 66. Okay, hit it. Right?
21 05 56  CMP  66 7, calling for a polarity negative —
21 06 00  ACDR  Yeah.
21 06 01  CMP  391 and what —
21 06 02  ACDR  391 —
21 06 03  CMP  — was the number they gave me on the pad?
21 06 04  ACDR  391 is 447.
21 06 05  CMP  Okay, that's close.
21 06 07  ACDR  39 —
21 06 08  CMP  I'm giving it to the G&N.
21 06 09  ACDR  391 point —
21 06 11  CMP  When it thrusts, you see how it affects the — the pattern out there?
21 06 14  ACDR  Okay, go to 5 and 5 on your scale, Vance.
21 06 15  CMP  Yeah.
21 06 16  DMP  Man, that's beautiful.
<table>
<thead>
<tr>
<th>Time</th>
<th>Agency</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 06 17</td>
<td>ACDR</td>
<td>Okay, KEY RELEASE.</td>
</tr>
<tr>
<td>21 06 20</td>
<td>CMP</td>
<td>That's something. Look at that out at the left. Beautiful, god, beautiful!</td>
</tr>
<tr>
<td>21 06 24</td>
<td>ACDR</td>
<td>Got a beautiful capture.</td>
</tr>
<tr>
<td>21 06 25</td>
<td>CMP</td>
<td>Something - piece out there is flying wing on us.</td>
</tr>
<tr>
<td>21 06 27</td>
<td>ACDR</td>
<td>We got a cross range of 23.5 - I mean, cross range of 55 and a down range of 2 - 21 - 210 and coming in.</td>
</tr>
<tr>
<td>21 06 39</td>
<td>CMP</td>
<td>Okay, we're just doing great.</td>
</tr>
<tr>
<td>21 06 42</td>
<td>DMP</td>
<td>We're captured.</td>
</tr>
<tr>
<td>21 06 44</td>
<td>ACDR</td>
<td>Okay, the next time we want it in is the - 27:51.</td>
</tr>
<tr>
<td>21 06 57</td>
<td>CMP</td>
<td>This - this lasts a hell of a long time. Makes kind of a curlycue out there.</td>
</tr>
<tr>
<td>21 07 01</td>
<td>ACDR</td>
<td>Yeah, it's the vortex. Last for 5 minutes. About 27 - we have about 27:49.</td>
</tr>
<tr>
<td>21 07 07</td>
<td>CMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>21 07 08</td>
<td>ACDR</td>
<td>Record DAP data.</td>
</tr>
<tr>
<td>21 07 09</td>
<td>CMP</td>
<td>We got a proper direction and roll.</td>
</tr>
<tr>
<td>21 07 14</td>
<td>ACDR</td>
<td>Okay, 29:17, minus 15 2. Next thing is going to be the reverse bank angle, which is 33:42. And the film mag is looking pretty good, check - Deke.</td>
</tr>
<tr>
<td>21 07 27</td>
<td>DMP</td>
<td>Yeah, I went back to 2, Tom, because I wasn't - -</td>
</tr>
<tr>
<td>21 07 28</td>
<td>ACDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>21 07 29</td>
<td>DMP</td>
<td>-- seeing enough change in the ... --</td>
</tr>
<tr>
<td>21 07 30</td>
<td>ACDR</td>
<td>Yeah.</td>
</tr>
<tr>
<td>21 07 32</td>
<td>DMP</td>
<td>-- to warrant --</td>
</tr>
<tr>
<td>21 07 33</td>
<td>ACDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>21 07 34</td>
<td>DMP</td>
<td>-- you rolling.</td>
</tr>
<tr>
<td>21 07 36</td>
<td>CMP</td>
<td>Okay, it's going over to 52 degrees.</td>
</tr>
</tbody>
</table>
21 07 39 ACDR  Okay.
21 07 40 CMP   Start taking out our cross range.
21 07 41 ACDR  Yep.
21 07 43 DMP   Man, that is beautiful.
21 07 45 CMP   Wow, look out the top window there.
21 07 47 DMP   Whoo, look at that!
21 07 48 ACDR  Yep.
21 07 49 DMP   It's beautiful.
21 07 50 CMP   Man, are we skittering.
21 07 54 CMP   Minus 84.
21 07 55 DMP   I can't believe I'm getting it with this camera, but maybe I am.
21 08 00 CMP   Oh, god, that's beautiful; I hope you got a good picture there, Deke.
21 08 03 DMP   I'm trying. I'm shooting the hell out this window.
21 08 06 ACDR  What's your ... --
21 08 07 CMP  33:42.
21 08 08 DMP   I just hope the hell we got the right settings.
21 08 10 ACDR  He's really trying to --
21 08 11 CMP   Minus 106.
21 08 13 ACDR  He's really trying to - pull off ... a few g's here.
21 08 15 CMP   Yeah, man.
21 08 16 ACDR  See, we - we're only up to about a third of a g.
21 08 17 CMP   Yeah.
21 08 19 ACDR  See, we -
21 08 22  CMP  Yeah, look at that.  He's still - 1100 miles out and he's got to get down in about 600 -
21 08 27  ACDR  We're going to - Here come - here come the g's.  Okay, just keep - -
21 08 30  DMP  Oh, man.
21 08 31  CMP  Man, we're overshooting one hell of a lot.
21 08 32  DMP  Are we?
21 08 33  ACDR  Yeah.
21 08 34  CMP  Yeah.
21 08 35  ACDR  It's got 11½ - -
21 08 36  CMP  11½ miles.
21 08 37  ACDR  He can pull it out; no shit.  That's -
21 08 38  CMP  Oh, yeah.  Look at that!  Look at that thing out there now.
21 08 40  DMP  Oh, yeah.
21 08 41  ACDR  Here we go!  We're coming up eight-tenths of a g.
21 08 42  CMP  Yeah.
21 08 43  ACDR  86.  Look how he's pulling that out; 77 miles.
21 08 46  DMP  That's only eight-tenths of a g?
21 08 47  ACDR  Yep.  Like - -
21 08 48  DMP  Shit!
21 08 49  ACDR  -- like I told you, we're only - we're not even up to one g yet (laughter).
21 08 52  DMP  Christ!
21 08 53  ACDR  Okay, here we go!  60 miles to go; 41 cross range.  The cross range is down to 41.
21 08 57  DMP  Hard to believe.
21 08 59  CMP  He's going to get that cross range all the way out.
21 09 01  ACDR  You better believe it. 60 miles on it -
21 09 03  CMP  God! We're looking low. (Laugher)
21 09 05  ACDR  Yep! We sure are.
21 09 06  DMP  Okay, I'm watching for steam pressures.
21 09 08  CMP  Yep.
21 09 09  ACDR  Okay.
21 09 10  CMP  Well, I know we're not.
21 09 11  ACDR  38. Okay, we're up to - to 1-1/2 g's. (Laughter)
21 09 14  DMP  Oh, man! Feels like --
21 09 15  ACDR  Okay. 36 cross range, 45 down range. Okay.
21 09 21  CMP  2 g's.
21 09 22  ACDR  2 g's.
21 09 23  DMP  Shit. Man, it feels --
21 09 24  ACDR  Feels like you're really pulling the old thing. (Laughter)
21 09 25  DMP  -- like 6 g's.
21 09 26  CMP  It's doing it just right on the EMS.
21 09 27  ACDR  Yeah. Okay.
21 09 30  DMP  Okay, I'm going to keep shooting away here and do this ... again.
21 09 31  ACDR  Returning to Earth, okay.
21 09 32  CMP  (Laughter)
21 09 34  ACDR  31 cross range, 7 down range. He'll put it out some more. 30 cross range -
21 09 41  DMP  As long as I can get the camera --
<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 09 42</td>
<td>ACDR</td>
<td>28 cross range -</td>
</tr>
<tr>
<td>21 09 44</td>
<td>DMP</td>
<td>-- up there, we'll get pictures.</td>
</tr>
<tr>
<td>21 09 45</td>
<td>ACDR</td>
<td>Okay. 10, down range. Now we're pulling some, up to 3 g's. And 9.5, 25 cross - 3 g's.</td>
</tr>
<tr>
<td>21 09 58</td>
<td>CMP</td>
<td>42. It's doing just right.</td>
</tr>
<tr>
<td>21 09 59</td>
<td>ACDR</td>
<td>Yep. 22 cross range, we're going to beat it.</td>
</tr>
<tr>
<td>21 10 03</td>
<td>DMP</td>
<td>...</td>
</tr>
<tr>
<td>21 10 05</td>
<td>CMP</td>
<td>3.2 g's.</td>
</tr>
<tr>
<td>21 10 07</td>
<td>DMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>21 10 09</td>
<td>ACDR</td>
<td>Down to 17 000 feet per second, and we're 19 miles cross range, 10 down range.</td>
</tr>
<tr>
<td>21 10 16</td>
<td>CMP</td>
<td>(Coughing)</td>
</tr>
<tr>
<td>21 10 18</td>
<td>ACDR</td>
<td>Okay, 17.</td>
</tr>
<tr>
<td>21 10 20</td>
<td>CMP</td>
<td>That fireball lasts a long time.</td>
</tr>
<tr>
<td>21 10 21</td>
<td>ACDR</td>
<td>Yeah.</td>
</tr>
<tr>
<td>21 10 22</td>
<td>DMP</td>
<td>It sure does.</td>
</tr>
<tr>
<td>21 10 23</td>
<td>CMP</td>
<td>Minus 15.</td>
</tr>
<tr>
<td>21 10 24</td>
<td>DMP</td>
<td>Gosh, I'm getting stills of it.</td>
</tr>
<tr>
<td>21 10 26</td>
<td>CMP</td>
<td>(Coughing)</td>
</tr>
<tr>
<td>21 10 28</td>
<td>ACDR</td>
<td>210 to go, 206. 13. It looks good. 11. 14 500 velocity.</td>
</tr>
<tr>
<td>21 10 37</td>
<td>CMP</td>
<td>8 miles. Or, no, 11 miles.</td>
</tr>
<tr>
<td>21 10 42</td>
<td>ACDR</td>
<td>10 miles.</td>
</tr>
<tr>
<td>21 10 43</td>
<td>CMP</td>
<td>I was thinking of something else.</td>
</tr>
<tr>
<td>21 10 44</td>
<td>ACDR</td>
<td>9 miles.</td>
</tr>
<tr>
<td>21 10 45</td>
<td>CMP</td>
<td>(Coughing) Cross - (coughing) cross range is 8.</td>
</tr>
</tbody>
</table>
Okay, reverse bank time is 33:42.

Okay.

Okay, we're pulling 3 g's. He'll overshoot and then reverse it. 6 miles cross range. There we go, baby.

Yeah.

Don't worry about it.

Okay, we got rid of most of the fireball.

Still minus. Looks - 38. (Chuckling) Look at that smart little computer.

There, it reversed signs.

Yeah.

Okay, reverse.

It'll do it.

No, it --

It - it will.

-- didn't -- didn't reverse in register 1.

Apollo, Houston. Talking at you through ARIA.

Roger.

Loud and que - clear, Crip. Doing fine.

309.

...

Yeah, we're doing - doing just great.

That computer is steering it right out, Crip. 33:42.

Okay, got a minus 610.

There's minus --
Roger, Tom. You're ...

— minus — minus. That son of a bitch!

He's got us — steering just right.

There! There we go.

We're ... in good shape, Crip.

There we go.

(Chuckling) That's one heck of a maneuver, isn't it?

... See that yaw?

Yeah.

Okay, we're down to 7000 feet per second.

How many g's we pulling now?

The g's backed off to 2-1/2 g's, and she — that little baby's steering it right out.

It holds 2-1/2 a lot longer than I thought it would.

Yep. 1.2 in the ...

I don't see any fireball anymore; I'm going to turn the camera off.

Turn it off, Deke. Might set it up for 6, 8, and a sec later on.

Yeah, ...

Two to go on steam pressure.

Still got some film left there, Deke?

Oh, yeah.

Don't move your head —

I want to save some for —

— ... it's reversing.
21 12 29  DMP  -- for the drogues and the mains. Oh, shit! We're on SECONDARY.

21 12 35  ACDR  ... reverse ... it missed that. Okay.

21 12 40  CMP  Okay, how - should be getting steam pressure, huh? About now?

21 12 42  DMP  Yeah, shit. We've been on - we been in PRIMARY. I don't know when - we should be 90K, huh?

21 12 46  CMP  Yeah. We had SECONDARY on for a while.

21 12 50  ACDR  Okay, let's look at the time for - the next time is - drogues is 36:27. Okay, stand by for this thing off the peg.

21 13 00  CMP  Okay.

21 13 01  ACDR  It's trying to steer it out.

21 13 04  CMP  ... got 8 - Damn.

21 13 09  ACDR  Okay.

21 13 11  DMP  There we are.

21 13 14  ACDR  Okay. Drogues at 36:27 --

21 13 16  DMP  They want that at 12 frames?

21 13 19  ACDR  1 minute to drogues.

21 13 21  DMP  Okay, give me a 30K mark, will you, Tom?

21 13 23  ACDR  Okay.

21 13 24  CMP  I will. One of us will.

21 13 28  ACDR  Okay, 36:27.

21 13 31  DMP  We at 50K?

21 13 32  ACDR  Not yet.

21 13 33  DMP  Okay.

21 13 34  CMP  Okay, here comes 50K --
Okay, altimeter's coming off the peg.

50K.

Nine-tenths of a mile miss distance. Key in VERB, No, pardon me - seven-tenths; this baby is right on.

45K. Okay, at 30K --

... looking good here; we got data and we got - we got you in radar contact at the ship.

Okay, we got her hook down. Okay, 30K --

Okay, what comes --

-- for the pyros.

You got the pyros coming on.

Okay, 30K for the pyros.

BOOST/ENTRY.

BOOST/ENTRY.

What else is on your checklist?

That's it. BOOST/ENTRY --

Okay.

-- and SECS PYRO at 50.

All right.

At 30, give me a hack and I'll - it's ELS, LOGIC, AUTO, and I'll start the DAC.

Okay. Stand by, it's --

30 - 27K. Start your DAC.

Okay, she's running.

Okay, 26K.

Okay, stand by for drogues.
Okay.

24K.

Did she come out? Any drogues?

Don't see them.

Don't see any.

Did you hit your button – there?

There's the apex cover.

There they are.

I hit a ...

...  

Got them.

And we're on the drogues.

Yep.

Yes, sir.

I got the PROPELLANTS, OFF.

How are you running on altitude?

Quite a ride, you know? (Cough)

O2 FLOW HIGH.

Okay, coming down at 11 000.

(Coughing)

Wouldn't worry about that.

(Coughing)

Stand by for the main; ELS, LOG – LOGIC –

AUTO! AUTO!

Oh, hell. LOGIC and AUTO!
Boy, there's a lot of gas in here.

Push the MAINS!

I'll bet that fucking barostat's completely iced.

I'll bet that barostat was frozen.

Goddamn, I got the -

Okay, we're on the mains.

Purge.

No, no, no, no.

Don't - don't touch.

What's the matter?

I don't know what the hell we got here.

How's the cabin pressure?

It's coming up (coughing). It's okay, it's (cough) 2.

Hey, we forgot these -

I called them off - ELS, LO - LOGIC, didn't I?
21 16 03 REC  *** my position is 025 degrees. I am on the New Orleans 169 degree radial, 7.5 nautical miles.

21 16 14 NEW  New Orleans; roger. Out.

21 16 15 DMP  ...

21 16 16 ACDR  Huh?

21 16 17 CMP  Strut locked?

21 16 19 REC  Apollo, Recovery. Over.

21 16 22 DMP  I did.

21 16 23 ACDR  I've got those propellants off, I don't know why the hell it got that shit in here.

21 16 25 DMP  Oh, man!

21 16 26 REC  Apollo, this is Recovery broadcasting in the blind. Switching to Astro voice, secondary.

21 16 34 CMP  What the hell's --

21 16 35 ACDR  Okay, 10K - VHF ANTENNA, RECOVERY, and SIMPLEX.

21 16 37 CMP  (Coughing)

21 16 38 DMP  Yeah, I got that.

21 16 39 CMP  (Coughing)

21 16 40 ACDR  Okay.

21 16 43 DMP  FLIGHT POSTLANDING (cough) -

21 16 45 DMP  Here it goes.

21 16 47 CMP  (Coughing)

21 16 49 ACDR  Okay, E - EMS, OFF/STANDBY if you get a chance; it doesn't matter.

21 16 52 ACDR  Coming through 2800 feet.

21 16 53 DMP  That ...
Apollo, this is Recovery broadcasting in the blind --
Okay, what next?
-- no reception on Astro voice, secondary. We have you in sight visually; you have three good chutes at this time.
Roger.
What's the altitude?
Okay. We're at 2000 feet, Deke.
Okay.
New Orleans, Recovery.
... circuit breaker -- 
The latest bearing is 025 degrees; I am on New Orleans 150 degree radial --
... what the hell's the --
-- 5.5 nautical miles.
... 
New Orleans; roger. Out. And we have a good picture. Over.
You got everything?
Yeah.
Okay.
This is Recovery. Roger.
Just give me a hack --
-- four PITCH and YAW, OPEN.
Got them.

DMP/CMP: (Coughing)

SWIM: New Orleans, this is Swim. I have a beacon --

DMP: Anybody check those sea lights?

CMP: Okay. Let's get it on right now.

SWIM: -- bearing 200; I'm on 020 at 13.

CMP: Got it.

ACDR: Okay, come up on --

NEW: New Orleans; roger. Out.

CMP: Okay, 800 feet.

DMP: 800 feet? Okay.

ACDR: Hey, guys. Stand by for splashdown.

ACDR: CABIN PRESSURE RELIEF valve, CLOSED, latch; DIRECT O₂ valve --

REC: And Swim has a tally on the command module --

ACDR: -- MAIN BUS TIES are coming off, ready? MAIN --

END OF TRANSCRIPTION